



KARPAGAM
ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
(Established Under Section 3 of UGC Act, 1956)

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act, 1956)

Pollachi Main Road, Eachanari Post, Coimbatore - 641 021, Tamilnadu, India.

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This is to certify that the enclosed pages (2 to 374) consists of the Curriculum followed for various programmes offered between the academic years 2019-2020.

Dr. mmmmy

REGISTRAR

Karpagam Academy of Higher Education
(Deemed to be University Under Section 3 of UGC Act 1956,
Pollachi Main Road, Eachanari Post,
Coimbatore - 641 021.



ACADEMY OF HIGHER EDUCATION

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Common Colour Coding For the Courses In The Curriculum

| Colour | Particular |
|---------------|--------------------------|
| Blue | Employability |
| Green | Entrepreneurship |
| Red | Skill Development |

KARPAGAM ACADEMY OF HIGHER EDUCATION

Deemed to be University

(Established Under Section 3 of UGC Act 1956)

Eachanari Post, Pollachi Main Road, Coimbatore -641021

M.Sc.APPLIED ASTROLOGY COURSE (2019-2020)



COURSE OF STUDY AND SCHEME OF EXAMINATION

DEPARTMENT OF ASTROLOGY
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAMME CBCS M.Sc APPLIED ASTROLOGY

| Course Code | Name of the Course | Objectives & Out Comes | | Instruction hours / week | | | Credit(s) | Mamimum Marks | | |
|--------------|--|------------------------|----------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | TOTAL |
| SEMESTER - I | | | | | | | | | | |
| 19ASP101 | அடிப்படை ஜோதிடவியல் - I Fundamentals of Astrology-I | 1 | 1 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP102 | ஜோதிடவியலில் கோள்கள் - I Planets in Astrology-I | 1 | 1,8 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP103 | பிரஸன்ன ஜோதிட முறைகள் - I Horary Astrological methods I | 3 | 5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP104 | ராசிகள் பாவகங்கள் நட்சத்திரங்கள்-I Rasi – Bhava – Star Constelations -I | 1 | 2 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP105B | அடிப்படை வாஸ்து – I Fundamental Vasthu -I | 2 | 4 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP111 | பலன் சொல்லும் முறைகள் - I Predictive methods in Astrology-I | 1,2 | 4,1 0 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19ASP112 | Prediction – Marriage, Education | 1,2 | 11 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | Total | | | | | | 24 | 280 | 420 | 700 |
| SEMESTER II | | | | | | | | | | |
| 19ASP201 | அடிப்படை ஜோதிடவியல் -II Fundamentals of Astrology-II | 1 | 1 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP202 | ஜோதிடவியலில் கோள்கள் -II Planets in Astrology-II | 1 | 1 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP203 | பிரஸன்ன ஜோதிட முறைகள் - II Horary Astrological methods-II | 2 | 5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP204 | ராசிகள் பாவகங்கள் நட்சத்திரங்கள்II Rasi – Bhava – Star Constelations-II | 1 | 2 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP205B | Modern vasthu II | 2 | 4 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP211 | பலன் சொல்லும் முறைகள் - II Predictive methods in Astrology-II | 2 | 2,6 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19ASP212 | Prediction – Job, Business | 3 | 6,1 1 | 4 | 0 | 4 | 2 | 40 | 60 | 100 |
| | Total | | | | | | 24 | 280 | 420 | 700 |

| SEMESTER III | | | | | | | | | | |
|--------------|---|-----|----------|---|---|---|----|-----|-----|-----|
| 19ASP301 | புதிய ஜோதிட முறைகள் Modern Astrological Methods | 2 | 3,6 | 4 | 0 | 0 | 4 | 40 | 60 | |
| 19ASP302 | ஜோதிடவிதிகளில் முகூர்த்தங்கள் - Muhurtha in Astrology | 3 | 7 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP303 | மருத்துவ ஜோதிடம் Medical Astrology | 3 | 8 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP304 | ஜோதிட கணித முறைகள் Casting Horoscope | 1 | 9 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP305B | Ashtavargam | 2 | 10 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP311 | Marriage Matching – Practical | 1 | 11 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ASP312 | Prediction Overall - Practical | 1,8 | 11 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| | | | | | | | 28 | 280 | 420 | 700 |
| SEMESTER IV | | | | | | | | | | |
| 19ASP491 | Project | 2,3 | 2,1 1 | 0 | 0 | 0 | 15 | 80 | 120 | 200 |

The following are the Elective papers

| List of Elective Papers | | |
|-------------------------|-------------|---|
| S.No | Course Code | Subjects |
| 1. | 19ASP105(A) | எண்கணிதம் (Numerology) |
| 2. | 19ASP105(B) | ஆடிப்படை வாஸ்து – I (Fundamentals of Vasthu – I) |
| 3. | 19ASP105(C) | அங்கலட்சணம் மற்றும் மச்சங்கள் (Samuthrika Lakshanam) |
| 4. | 19ASP205(A) | நவரத்தினங்கள் (Gemology) |
| 5. | 19ASP205(B) | நவீன வாஸ்து – II (Modern Vasthu – II) |
| 6. | 19ASP205(C) | கைரேகை சாஸ்திரம் (Palmistry) |
| 7. | 19ASP305(A) | தாஜிகம் (Thajigam) |
| 8. | 19ASP305(B) | அஷ்டவர்க்கம் (Astavargam) |
| 9. | 19ASP305(C) | 16 வர்க்க சக்கரங்களும் பலன்களும் (Predictions through 16 Varga Chakras) |

Programme outcomes

- 1) சோதிட முதுகலை மாணவர்கள் வானவியல் பற்றிய, சோதிடவியல் பற்றிய வரலாற்றை அறிவதால் இத்துறையின் பழமையையும் பெருமையையும் புரிந்து கொள்வார்கள்
- 2) சோதிடவியலின் அடிப்படைத்தன்மைகள் இராசி காரகத்துவங்கள், கோள்களின் காரகத்துவங்கள், பாவக காரகத்துவங்கள் ஆகியவற்றை பற்றிய ஆழ்ந்த அறிவு சாதக பலன்கள் நிர்ணயிப்பத்தில் முக்கிய பங்கு வகிக்கும்.
- 3) சோதிடவியலுக்கு பெரும் புகழ் சேர்த்த சோதிட அறிஞர்களின் பலன் கூறும் முறைகளை தெரிந்து கொள்வதினால் இத்துறையில் பல சாதனைகள் பல செய்ய ஆர்வம் ஏற்படும்
- 4) எண்கணிதம், வாஸ்து, கைரேகை, நவரத்தினங்கள், அங்கலட்சணங்கள் ஆகிய துணைப்பாடங்களுக்கு சோதிடவியலே ஆதாரம் என்பது புலப்படும்.
- 5) சாதகம் இல்லாதவர்களுக்கு பலன்கள் சொல்லும் வகையில் பிரசன்ன முறைகள் மூலம் பலன்கள் அறிந்து கொள்ளலாம்.
- 6) நாடி முறை, ஜெயமினி முறை, கிருஷ்ணமூர்த்தி பத்ததி முறை, மேலைநாட்டு முறை ஆகிய முறைகளில் பலன்கள் சொல்லப்படுவது சோதிட துறையின் வளர்ச்சிக்கு ஆதாரங்கள் ஆகும்.

- 7) நல்ல முகூர்த்தங்களில் ஆரம்பிக்கும் செயல்கள் நல்ல பலன்களைத் தரும், தீய முகூர்த்தங்களில் ஆரம்பிக்கப்படும் செயல்கள் துன்பத்தை விளைவிக்கும் என்பதை உணரமுடியும்.
- 8) மருத்துவ சோதிடத்தின் மூலம் நோய் ஏற்படும் உடல் பாவகம், நோயின் தன்மை, நோய் ஏற்படும் காலம், நோய் தீர்க்கும் முறைகள் ஆகியவற்றை தெளிவாக அறிய முடியும்.
- 9) சோதிட கணித முறைகளை அறிந்து கொள்வதின் மூலம் இக்கால விஞ்ஞானம், கணினி முதலியன அழிந்தாலும் சோதிட கணித முறைகள் அழியாமல் பாதுகாக்க முடியும்.
- 10) அஷ்டவர்க்கங்கள், தாஜிகம், பதினாறு வர்க்க சக்கரங்கள் பற்றிய அறிவு, சாதக பலன்களை சொல்லுவதில் துல்லியத்தை நிர்ணயிக்க உதவும்.
- 11) கல்வி, திருமணம், தொழில், புத்திரபேறு முதலியவை பற்றிய கேள்விகளுக்கு தெளிவான பலன்களை சொல்ல முடியும்.

Programme Specific outcomes

- 12) தனிமனிதனின் பிரச்சனைகளுக்கு சோதிட ரீதியில் சரியான தீர்வை கொடுக்க முடியும்.
- 13) எதிர்காலத்தில் நடக்கக்கூடிய நன்மை, தீமைகளை முன் கூட்டியே அறிந்து, அதற்காக முன் எச்சரிக்கை நடவடிக்கைகளை எடுத்துக் கொள்ள முடியும்.
- 14) சோதிட சாஸ்திரம் தனிமனிதனின் வளர்ச்சிக்கும், நாட்டின் வளர்ச்சிக்கும் ஒரு வழிகாட்டியாக அமையும்.

Programme Educational Objectives (PEOs)

PEO 1 : சோதிடவியல் முதுகலைப்பட்ட தாரிகளுக்கு வானவியல் அறிவு, சோதிடவியலின் வரலாறு, சோதிடவியலின் அடிப்படைத் தன்மைகள், கோள்கள், இராசிகள், பாவகங்கள் பற்றிய அறிவு உள்ளதால் கால தேச வர்த்தமானங்களுக்கு ஏற்ற வகையில் பலன்கள் கூறுவதற்கான திறமைகள் வளரும்.

PEO 2 : சாதக பலன்கள் சொல்லுவதற்கு சோதிட சாஸ்திரத்தில் பல முறைகள் உண்டு. அனைத்து முறைகளிலும் நன்கு பயிற்சி அளித்து, இத்துறையில் வலிமை உள்ளவர்களாக மாற்ற முடியும். இவர்கள் இத்துறையில் புதிய கண்டுபிடிப்புகளை கண்டுபிடிக்க முடியும். சோதிடத்தின் துணை சாஸ்த்திரங்களான கைரேகை, வாஸ்து, எண்கணிதம் முதலியவற்றிலும் அறிவு வளரும்.

PEO 3 : இது ஒரு தெய்வீக கலை என்பதால் சோதிட முதுகலை பட்டதாரிகள் ஒழுக்கத்தில் சிறந்தவர்களாகவும், சோதிட அறிவில் தன்னிகரற்றவர்களாகவும் மாற்றம் ஏற்படும். தற்காலத்தில் சமுதாயத்தில் ஏற்படும் அனைத்து தனி மனித பிரச்சனைகளுக்கும் தீர்வு காணமுடியும்.

| POs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| PEO 1 | X | X | | | X | | X | | | | | | | |
| PEO 2 | | X | X | X | X | | | | X | X | X | | | X |
| PEO 3 | | | | | | X | X | X | | | X | X | X | X |

KARPAGAM ACADEMY OF HIGHER EDUCATION
Coimbatore – 641 021
DEPARTMENT OF BIOCHEMISTRY
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS)-B.Sc., Biochemistry
(2019–2020 and onwards)

| Course code | Name of the course | Objective s and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|---------------------------------|------|-----------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19LSU101 | Language -I | I | a | 4 | - | - | 4 | 40 | 60 | 100 |
| 19ENU101 | English | I | a | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU101 | Molecules of Life | I | b, k | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 19BCU102 | Cell Biology | I | d, k | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU103 | Chemistry-I | I | d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU111 | Molecules of Life- Practical | III | d | - | - | 3 | 2 | 40 | 60 | 100 |
| 19BCU112 | Cell biology - Practical | III | d | - | - | 3 | 2 | 40 | 60 | 100 |
| 19BCU113 | Chemistry Practical- I | III | d | - | - | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 19 | 1 | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – II | | | | | | | | | | |
| 19LSU 201 | Language - II | I | a | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU201 | Proteins | III | e, k | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU202 | Enzymes | III | e | 4 | 1 | - | 5 | 40 | 60 | 100 |
| 19BCU203 | Chemistry-II | I | e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU211 | Proteins - Practical | III | e | - | - | 3 | 2 | 40 | 60 | 100 |
| 19BCU212 | Enzymes- Practical | III | e | - | - | 3 | 2 | 40 | 60 | 100 |
| 19BCU213 | Chemistry Practical -II | III | e | - | - | 4 | 2 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | IV | h | 3 | - | - | 3 | 40 | 60 | 100 |
| Semester Total | | | | 19 | 1 | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – III | | | | | | | | | | |
| 19BCU301 | Metabolism of Carbohydrates and Lipids | I | f | 4 | | | 4 | 40 | 60 | 100 |
| 19BCU302 | Metabolism of Amino acids and Nucleic acids | I | f | 4 | | | 4 | 40 | 60 | 100 |
| 19BCU303 | Membrane Biology & Bioenergetics | I | f | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 19BCU311 | Metabolism of Carbohydrates and Lipids – Practical | III | c, f | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU312 | Metabolism of Amino acids and Nucleic acids- Practical | III | c, f | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU313 | Membrane Biology & Bioenergetics - Practical | III | c, f | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU304A | Tools and Techniques in Biochemistry | II | c, f | 3 | - | - | 3 | 40 | 60 | 100 |
| 19BCU304B | Concepts in Genetics | I | c, f | | | | | | | |
| 19BCU314A | Tools and Techniques in Biochemistry – Practical | III | c, f | - | - | 3 | 1 | 40 | 60 | 100 |
| 19BCU314B | Concepts in Genetics - Practical | III | c, f | | | | | | | |
| Semester Total | | | | 14 | 1 | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19BCU401 | Gene Organization, Replication and Repair | I, II | g | 4 | - | | 4 | 40 | 60 | 100 |
| 19BCU402 | Gene Expression and Regulation | I, II | g | 4 | - | | 4 | 40 | 60 | 100 |
| 19BCU403 | Human Physiology | I, II | g | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 19BCU411 | Gene Organisation, Replication and Repair- Practical | III | c, g | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU412 | Gene Expression and Regulation- Practical | III | c, g | - | - | 4 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|---|--|---------|---------|-----------|----------|-----------|-------------|-------------|-------------|-------------|
| 19BCU413 | Human Physiology – Practical | III | c, g | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU404A | Bioinformatics | III | c, g | 3 | - | - | 3 | 40 | 60 | 100 |
| 19BCU404B | Protein Purification Techniques | | c, g | | | | | | | |
| 19BCU414A | Bioinformatics - Practical | III | c, g | - | - | 3 | 1 | 40 | 60 | 100 |
| 19BCU414B | Protein Purification Techniques - Practical | | c, g | | | | | | | |
| Semester Total | | | | 14 | 1 | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – V | | | | | | | | | | |
| 19BCU501 | Hormone: Biochemistry and Functions | V | d, e, k | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 19BCU502A | Clinical Biochemistry | II, III | d, e | 3 | - | - | 3 | 40 | 60 | 100 |
| 19BCU502B | Biochemical Correlation of Diseases | II, III | d, e | | | | | | | |
| 19BCU503A | Basic Microbiology | I | d, e, l | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU503B | Nutritional Biochemistry | I | i, l | | | | | | | |
| 19BCU504A | Plant Biochemistry | V | d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU504B | Molecular Basis of Infectious diseases | V | d, e | | | | | | | |
| 19BCU511 | Hormone: Biochemistry and Functions – Practical | III | j | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU512A | Clinical Biochemistry- Practical | III | j | - | - | 3 | 1 | 40 | 60 | 100 |
| 19BCU512B | Biochemical Correlation of Diseases- Practical | III | j, n | | | | | | | |
| 19BCU513A | Basic Microbiology- Practical | III | j | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU513B | Nutritional Biochemistry- Practical | III | j | | | | | | | |
| 19BCU514A | Plant Biochemistry—Practical | III | j | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU514B | Molecular Basis of Infectious diseases-Practical | III | j | | | | | | | |
| Semester Total | | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – VI | | | | | | | | | | |
| 19BCU601 | Immunology | V | i, j | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 19BCU602A | Genetic Engineering and Biotechnology | I | g, n, l | 3 | - | - | 3 | 40 | 60 | 100 |
| 19BCU602B | Research Methodology | V | i, j, m | | | | | | | |
| 19BCU603A | Drug Biochemistry | II | i, j, l | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCU603B | Biostatistics | III | e, l | | | | | | | |
| 19BCU611 | Immunology Practical | III | i, j | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU612A | Genetic Engineering and Biotechnology- Practical | III | e | - | - | 3 | 1 | 40 | 60 | 100 |
| 19BCU612B | Research Methodology - Practical | III | i, j | | | | | | | |
| 19BCU613A | Drug Biochemistry- Practical | II | d | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCU613B | Biostatistics-Practical | III | e | | | | | | | |
| 19BCU691 | Project work | IV | j | 2 | - | 6 | 6 | 40 | 60 | 100 |
| ECA / NCC / NSS / Sports / General interest etc | | | | | | | Good | | | |
| Semester Total | | | | 13 | - | 17 | 22 | 280 | 420 | 700 |
| Program Total | | | | 94 | 4 | 82 | 140 | 1880 | 2820 | 4700 |

Blue – Employability

Green – Entrepreneurship

Red – Skill Development

| Ability Enhancement Courses (AEC) | | |
|-----------------------------------|-------------|-----------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language –I |
| | 19ENU101 | English |
| II | 19LSU201 | Language –II |
| | 19AEC201 | Environmental Studies |

| Generic Elective Courses (GE) /Allied Courses | | |
|---|-------------|--------------------------|
| Semester | Course Code | Name of the Course |
| I | 19BCU103 | Chemistry – I |
| | 19BCU113 | Chemistry – I Practical |
| II | 19BCU203 | Chemistry - II |
| | 19BCU213 | Chemistry – II Practical |

| Core Courses (CC) | | |
|-------------------|-------------|--|
| Semester | Course Code | Name of the Course |
| I | 19BCU101 | Molecules of Life |
| | 19BCU102 | Cell biology |
| | 19BCU111 | Molecules of Life- Practical |
| | 19BCU112 | Cell biology - Practical |
| II | 19BCU201 | Proteins |
| | 19BCU202 | Enzymes |
| | 19BCU211 | Proteins - Practical |
| | 19BCU212 | Enzymes- Practical |
| III | 19BCU301 | Metabolism of Carbohydrates and Lipids |
| | 19BCU302 | Metabolism of Amino acids and Nucleic acids |
| | 19BCU303 | Membrane Biology & Bioenergetics |
| | 19BCU311 | Metabolism of Carbohydrates and Lipids - Practical |
| | 19BCU312 | Metabolism of Amino acids and Nucleic acids- Practical |
| | 19BCU313 | Membrane Biology & Bioenergetics - Practical |
| IV | 19BCU401 | Gene Organization, Replication and Repair |
| | 19BCU402 | Gene Expression and Regulation |
| | 19BCU403 | Human Physiology |
| | 19BCU411 | Gene Organisation, Replication and Repair- Practical |
| | 19BCU412 | Gene Expression and Regulation- Practical |
| | 19BCU413 | Human Physiology – Practical |
| V | 19BCU501 | Hormone: Biochemistry and Functions |
| | 19BCU511 | Hormone: Biochemistry and Functions - Practical |
| VI | 19BCU601 | Immunology |
| | 19BCU611 | Immunology Practical |
| | 19BCU691 | Project work |

| Skill Enhancement Courses(SEC) | | |
|--------------------------------|-------------|--|
| Semester | Course Code | Name of the Course |
| III | 19BCU304A | Tools and Techniques in Biochemistry |
| | 19BCU304B | Concepts in Genetics |
| III | 19BCU314A | Tools and Techniques in Biochemistry - Practical |
| | 19BCU314B | Concepts in Genetics - Practical |
| IV | 19BCU404A | Bioinformatics |
| | 19BCU404B | Protein Purification Techniques |

| | | |
|-----------|-----------|--|
| IV | 19BCU414A | Bioinformatics- Practical |
| | 19BCU414B | Protein Purification Techniques- Practical |
| V | 19BCU502A | Clinical Biochemistry |
| | 19BCU502B | Biochemical Correlations and Diseases |
| V | 19BCU512A | Clinical Biochemistry- Practical |
| | 19BCU512B | Biochemical Correlations and Diseases- Practical |
| VI | 19BCU602A | Genetic Engineering and Biotechnology |
| | 19BCU602B | Research Methodology |
| VI | 19BCU612A | Genetic Engineering and Biotechnology- Practical |
| | 19BCU612B | Research Methodology - Practical |

| Discipline Specific Elective Courses (DSE) | | |
|---|--------------------|--|
| Semester | Course Code | Name of the Course |
| V | 19BCU503A | Basic Microbiology |
| | 19BCU503B | Nutritional Biochemistry |
| | 19BCU504A | Plant Biochemistry |
| | 19BCU504B | Molecular basis of infectious diseases |
| V | 19BCU513A | Basic Microbiology- Practical |
| | 19BCU513B | Nutritional Biochemistry- Practical |
| | 19BCU514A | Plant Biochemistry- Practical |
| | 19BCU514B | Molecular basis of infectious diseases practical |
| VI | 19BCU603A | Drug Biochemistry |
| | 19BCU603B | Biostatistics |
| | 19BCU613A | Drug Biochemistry- Practical |
| | 19BCU613B | Biostatistics- Practical |

PROGRAMME OUTCOME (POs).

The Biochemistry graduate will be able to acquire

- a. **Critical Thinking and Language Training:** The ability to analyze information objectively and make a reasonable judgment and conclusion by evaluating data, facts, observable phenomenon, and research findings from a set of information and distinguish among priorities to solve a problem To train them to communicate science by improving their English vocabulary. Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
- b. **Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
- c. **Social Interaction:** Elicit views of others, mediate disagreements and help reach conclusions in group settings. Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
- d. **Understanding cellular function:** To equip them with basic and advanced knowledge in cell biology in order to get entry/placed in cell based research and development institution/laboratories.
- e. **Protein based skills:** To make them understand protein, enzymes and human physiology to lay solid foundation and to get through competitive examinations. To equip them to get placed in recombinant protein production industries/laboratory.
- f. **Understanding of endocrine system and metabolism:** To train them on the regulatory role of hormone on the metabolism of carbohydrates, lipids, amino acids and nucleic acid.
- g. **Molecular and Genetic understanding:** To train them on the genetic regulation of immune system and to use computational tools.
- h. **Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development.
- i. **Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.
- j. **Skill development:** To gain hands on experience on various biochemical experiments and to equip them to interpret the data.

PROGRAMME SPECIFIC OUTCOME (PSOs)

- k. Be able to demonstrate foundation knowledge in the areas of Biochemistry like Cell biology, Biomolecules, Protein Biochemistry, Molecular Biology, Pharmaceutical Chemistry and Hormonal Biochemistry.
- l. Be able to integrate knowledge learned in discipline specific courses like Microbiology, Plant Biochemistry, Nutritional Biochemistry, Biostatistics, Drug Biochemistry and Biotechnology.
- m. To use standard laboratory protocols in biochemistry, modern instrumentations, proper laboratory safety protocols and classical techniques to carry out experiments and also use computers in data acquisition and processing and use available software as a tool in data analysis.
- n. To understand the applications of biological sciences in Genetics, Biochemical Correlations of Diseases, Microbiology, Genetic Engineering and Biotechnology.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

- I. To give students a basic knowledge in biochemistry and to teach on ethics.
- II. To develop analytical and critical-thinking skills that allows independent exploration of biological phenomena through the scientific methods.
- III. To acquaint knowledge on modern methods of biochemical experimentation to implement for future studies.
- IV. To motivate students for social responsibilities and to educate them on ethical values in addition to inculcating environmental awareness.
- V. To enable them to execute a research objective through experimentation.

Mapping of PEOs and POs

| POs | a | b | c | d | e | f | g | h | i | j | k | l | m | n |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO I | X | X | | X | | X | X | | | | X | | | |
| PEO II | | | X | | | X | X | | | | X | X | X | X |
| PEO III | | | X | X | X | | X | | | | X | X | X | X |
| PEO IV | | | | | | | | X | | X | | | | X |

| | | | | | | | | | | | | | | |
|--------------|--|--|--|----------|----------|--|--|--|----------|----------|----------|----------|----------|----------|
| PEO V | | | | X | X | | | | X | X | X | X | X | X |
|--------------|--|--|--|----------|----------|--|--|--|----------|----------|----------|----------|----------|----------|

KARPAGAM ACADEMY OF HIGHER EDUCATION
Coimbatore – 641 021
DEPARTMENT OF BIOCHEMISTRY
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS)- M.Sc., Biochemistry
(2019–2020 and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|--------------------------------|---------|-----------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19BCP101 | Chemistry of Biopolymers | I | a | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP102 | Enzymes and Microbial Technology | II | d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP103 | Bioinstrumentation and Good Laboratory Practices | II | d, e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP104 | Cellular Biochemistry | III | a | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP105A | Plant Biochemistry | III | a | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP105B | Ecology and Evolutionary biology | I | c, f | | | | | | | |
| 19BCP105C | Biopharmaceutics | I | d | | | | | | | |
| 19BCP111 | Practical – I Quantitative Estimation and Separation Techniques | II | a | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCP112 | Practical – II Plant Biochemistry and Microbiology | I, III | a, e | - | - | 4 | 2 | 40 | 60 | 100 |
| | Journal paper analysis and Presentation | I- III | a, e | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – II | | | | | | | | | | |
| 19BCP201 | Regulation of Metabolic Pathways | II | a | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP202 | Molecular Biology | II | a, b | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP203 | Developmental Genetics | II | a, b | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP204 | Bioinformatics | III | d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP205A | Recombinant DNA Technology | I | d, j | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP205B | Animal Tissue Culture | III | d, e | | | | | | | |
| 19BCP205C | Genomics and Proteomics | III | d, j | | | | | | | |
| 19BCP211 | Practical – III Molecular Biology and Animal Biotechnology | II | d, g, i | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCP212 | Practical – IV Biological Databases and Analysis | III | d, g, i | - | - | 4 | 2 | 40 | 60 | 100 |
| | Journal paper analysis and Presentation | I-III | a, e | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – III | | | | | | | | | | |
| 19BCP301 | Immunology | I | a, h | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP302 | Clinical Biochemistry | I, III | a, d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP303 | Endocrinology | II | a, d | 4 | - | - | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|---|-------|---------|-----------|----------|----------|-----------|------------|-------------|-------------|
| 19BCP304 | Drug Biochemistry | III | a, d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP305A | Biostatistics and Research Methodology | III | e, g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19BCP305B | Clinical Research and IPR | III | d, e | | | | | | | |
| 19BCP305C | Dietetic Management of Disease | I | d, h | | | | | | | |
| 19BCP311 | Practical – V Clinical Enzymes and Immunology | I, II | d, e, i | - | - | 4 | 2 | 40 | 60 | 100 |
| 19BCP312 | Practical – VI Clinical Biochemistry and Animal Studies | I | d, e, i | - | - | 4 | 2 | 40 | 60 | 100 |
| | Journal paper analysis and Presentation | I-III | d, e | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – IV | | | | | | | | | | |
| 19BCP491 | Project and Viva Voce | I-III | a-j | 05 | - | 25 | 15 | 80 | 120 | 200 |
| Semester total | | | | | | | 15 | 80 | 120 | 200 |
| Program Total | | | | | | | 87 | 920 | 1380 | 2300 |

Blue – Employability

Green – Entrepreneurship

Red – Skill Development

Elective courses *

| Elective – 1 (18BCP105) * | | Core Elective – 2 (18BCP205) * | | Core Elective – 3 (18BCP305) * | |
|---------------------------|----------------------------------|--------------------------------|-----------------------------|--------------------------------|--|
| Course code | Name of the course (Theory) | Course Code | Name of the course (Theory) | Course Code | Name of the course (Theory) |
| 19BCP105-A | Plant Biochemistry | 19BCP205-A | Recombinant DNA Technology | 19BCP305-A | Biostatistics and Research Methodology |
| 19BCP105-B | Ecology and Evolutionary biology | 19BCP205-B | Animal Tissue Culture | 19BCP305-B | Clinical Research and IPR |
| 19BCP105-C | Biopharmaceutics | 19BCP205-C | Genomics and Proteomics | 19BCP305-C | Dietetic Management of Disease |

* The candidate has to select any one elective course from three options in each semester

Code: 19BCP101

19 - Academic Year

BC - Biochemistry

P - Master's Degree

First Digit - Semester number (1, 2, 3 and)

Second digit - Theory (0); Practical (1); Project (9)

Last digit - Paper number in the concerned semester (1, 2...)

PROGRAMME OUTCOMES (POs)

PG biochemistry graduate will be able to achieve

- a. **Critical Thinking and Effective Communication:** The teaching is intended to kindle the critical thinking of the student to address problems (Problem based learning) and equip them to list out their understanding (Activity based learning). The syllabus also includes journal paper presentation and analysis on specific topics of all subjects which will be evaluated by faculty handling the subject.
- b. **Future Career:** To prepare students for future careers in the various fields of biochemistry such as academic and research institution.
- c. **Societal Contribution and Social Interaction:** The Biochemistry Program will benefit the society on the whole by adding to the highly skilled scientific workforce, particularly for the biomedical research sectors, in the academic, industry as well as for research laboratories across the country and the globe. Inside the classrooms group discussion is encouraged on topics during the last five minutes of class to improve the understanding and to share the knowledge and view point. Outside the classroom, various outreach program is conducted on various health initiatives.
- d. **Identification and Differential Diagnosis:** To acquire biochemist position in leading hospitals and scientist position in industries.
- e. **Ethics:** Students learn about the significance of having right moral features to develop good interpersonal skills.
- f. **Environment and Sustainability:** Understand the role of citizen to maintain sustainable environment and encourage Eco-friendly initiatives.
- g. **Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context of health and disease.

PROGRAMME SPECIFIC OUTCOME (PSOs)

- h. To prepare students for future careers in various fields of biochemistry by enhancing analytical and critical-thinking skills in which a core understanding of the chemistry of biological processes are important for the understanding of human health and disease.
- i. To equip highly skilled scientific workforce, particularly for the biomedical research sectors, in the academic, industry as well as for research laboratories across the country and the globe.
- j. The skills acquired in the program will help the students in acquiring scientific, academic and industrial positions such as Analyst, Research Scientist at Pharma (R&D) Industries, Academician, Project Associates (JRF, SRF), Doctoral Research positions

abroad at India and abroad. Clinical biochemist at renowned hospitals, medical coding, Scientific writers.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- I. The course aims to impart advanced and in depth understanding on all the human physiological and pathological state. To understand the molecular process and their perturbation during disease.
- II. The program covers various aspects of Biomolecule estimation and regulation to ascertain health and disease state. metabolic pathways alterations along with their regulation at the replication, transcriptional, translational, and post-translational levels including by studying DNA, RNA and protein molecules, immunology, endocrinology, advancements in rDNA technologies to circumvent genetic disorders.
- III. Further to enrich research understanding various genomic, proteomic and bioinformatics tools are added. Animal cell culture, IPR, Biostatistics, research methodology, clinical research and Plant tissue culture are offered as elective papers to get specialized in a specific area. The final semester is devoted exclusively to enrich the students to address specific research objective.

Mapping of PEOs and POs

| POs | a | b | c | d | e | f | g | h | i | j |
|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| PEO I | X | | X | | | X | | | | |
| PEO II | X | | X | X | X | X | | X | X | X |
| PEO III | X | X | X | X | X | | X | | X | X |

KARPAGAM ACADEMY OF HIGHER EDUCATION
Department of Biotechnology
(Scheme of examination for 2019-2020 onwards)
B.Sc., Biotechnology Curriculum

| Course code | Name of the course | Objectives and Outcomes | | Instruction Hrs / week | | | Credit | Marks | | |
|--------------|---|-------------------------|--------------|------------------------|----|----|--------|-------|-----|-------|
| | | PEO's | PO's & PSO's | L | T | P | | CIA | ESE | Total |
| SEMESTER I | | | | | | | | | | |
| 19LSU101 | Language -I | - | - | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19ENU101 | English | - | - | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU101 | Biochemistry and Metabolism | I | a, b | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU102 | Cell Biology | I | a, b | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU103 | Chemistry -I | I | a | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU111 | Biochemistry and Metabolism Practical | I | a, b | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU112 | Cell Biology Practical | I | a, b | 00 | 00 | 03 | 2 | 40 | 60 | 100 |
| 19BTU113 | Chemistry Practical - I | I | a | 00 | 00 | 03 | 2 | 40 | 60 | 100 |
| | Semester total | | | 20 | 00 | 10 | 26 | 320 | 480 | 800 |
| SEMESTER II | | | | | | | | | | |
| 19LSU201 | Language - II | - | - | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU201 | Genetics | II | e | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU202 | Chemistry - II | I | a | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU203 | General Microbiology | I | c | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU211 | Genetics Practical | II | e | 00 | 00 | 03 | 2 | 40 | 60 | 100 |
| 19BTU212 | Chemistry Practical - II | I | a | 00 | 00 | 03 | 2 | 40 | 60 | 100 |
| 19BTU213 | General Microbiology Practical | I | c | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | I, IV | d, o | 00 | 00 | 04 | 4 | 40 | 60 | 100 |
| | Semester total | | | 20 | 00 | 10 | 26 | 320 | 480 | 800 |
| SEMESTER III | | | | | | | | | | |
| 19BTU301 | Plant Physiology | II | e | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU302 | Molecular Biology | II | e | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU303 | Immunology | II | f | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU304A | I.P.R., Entrepreneurship, Bioethics and Biosafety | IV | m, o | 03 | 00 | 00 | 3 | 40 | 60 | 100 |
| 19BTU304B | Bio - Analytical Tool | IV | m, n, o | | | | | | | |
| 19BTU311 | Plant Physiology Practical | II, IV | e, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU312 | Molecular Biology Practical | II, IV | e, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU313 | Immunology Practical | II | f, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU314A | I.P.R., Entrepreneurship, Bioethics and Biosafety | II, IV | m, o | 00 | 00 | 03 | 1 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--------------------|---|----------------|---------------------|-----------|-----------|-----------|-----------|------------|------------|------------|
| | Practical | | | | | | | | | |
| 19BTU314B | Bio - Analytical Tool Practical | IV | m, n, o | | | | | | | |
| | Semester total | | | 15 | 00 | 15 | 22 | 320 | 480 | 800 |
| SEMESTER IV | | | | | | | | | | |
| 19BTU401 | Bioprocess Technology | II | g, h | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU402 | Recombinant DNA Technology | II | e, g | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU403 | Genomics and Proteomics | II, III | e, h, g, j, l | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU404A | Industrial Fermentation | II | g, h | 03 | 00 | 00 | 3 | 40 | 60 | 100 |
| 19BTU404B | Enzymology | II | e, g, h | | | | | | | |
| 19BTU411 | Bioprocess Technology Practical | II, IV | g, h, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU412 | Recombinant DNA Technology Practical | II, IV | e, g, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU413 | Genomics and Proteomics Practical | II, III, IV | e, h, g, j, l, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU414A | Industrial Fermentation Practical | II, IV | g, h, n | 00 | 00 | 03 | 1 | 40 | 60 | 100 |
| 19BTU414B | Enzymology Practical | II, IV | e, g, h, n | | | | | | | |
| | Semester total | | | 15 | 00 | 15 | 22 | 320 | 480 | 800 |
| SEMESTER V | | | | | | | | | | |
| 19BTU501A | Plant Diversity - I | I | a | 03 | 00 | 00 | 3 | 40 | 60 | 100 |
| 19BTU501B | Basics of Forensic Science | IV | l | | | | | | | |
| 19BTU502A | Bioinformatics | III, IV | j, l | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU502B | Plant Diversity - II | I | a | | | | | | | |
| 19BTU503A | Plant Biotechnology | II, III | i, g | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU503B | Evolutionary Biology | I, III | b, i | | | | | | | |
| 19BTU504A | Animal Biotechnology | III | i | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU504B | Animal Diversity - I | I | a | | | | | | | |
| 19BTU511A | Plant Diversity Practical - I | I, IV | a, n | 00 | 00 | 03 | 1 | 40 | 60 | 100 |
| 19BTU511B | Basics of Forensic Science Practical | III, IV | l, n | | | | | | | |
| 19BTU512A | Bioinformatics Practical | III, IV | j, l, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU512B | Plant Diversity Practical – II | I, IV | a, n | | | | | | | |
| 19BTU513A | Plant Biotechnology Practical | II, III, IV | g, i, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU513B | Evolutionary Biology Practical | I, III, IV | b, i, n | | | | | | | |
| 19BTU514A | Animal Biotechnology | III, IV | i, n | 00 | 00 | 04 | | 40 | 60 | 100 |

| | | | | | | | | | | |
|---|---|------------|------------|----|----|----|-----|------|------|------|
| | Practical | | | | | | 2 | | | |
| 19BTU514B | Animal Diversity Practical - I | I | a, n | | | | | | | |
| | Semester total | | | 15 | 00 | 15 | 22 | 320 | 480 | 800 |
| SEMESTER VI | | | | | | | | | | |
| 19BTU601A | Molecular Diagnostics | III, IV | k, l, o | 03 | 00 | 00 | 3 | 40 | 60 | 100 |
| 19BTU601B | Biotechnology and Human Welfare | I, III | d, l | | | | | | | |
| 19BTU602A | Medical Microbiology | I, III | c, k | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU602B | Environmental Biotechnology | III, IV | d, k, l | | | | | | | |
| 19BTU603A | Biostatistics | III, IV | l, o | 04 | 00 | 00 | 4 | 40 | 60 | 100 |
| 19BTU603B | Environment Management | III, IV | d, k, l | | | | | | | |
| 19BTU611A | Molecular Diagnostics Practical | III, IV | k, l, o, n | 00 | 00 | 03 | 1 | 40 | 60 | 100 |
| 19BTU611B | Biotechnology and Human Welfare Practical | III, IV | d, l, n | | | | | | | |
| 19BTU612A | Medical Microbiology Practical | III, IV | c, k, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU612B | Environmental Biotechnology Practical | I, III, IV | d, k, l, n | | | | | | | |
| 19BTU613A | Biostatistics Practical | III | l, o, n | 00 | 00 | 04 | 2 | 40 | 60 | 100 |
| 19BTU613B | Environment Management Practical | I, III, IV | d, k, l, n | | | | | | | |
| 19BTU691 | Project – Viva Voce | III | l | 00 | 00 | 08 | 6 | 40 | 60 | 100 |
| ECA / NCC / NSS / Sports / General interest etc., | | | | | | | | | | Good |
| Semester total | | | | 11 | 00 | 19 | 22 | 280 | 420 | 700 |
| Grand Total | | | | 90 | 00 | 90 | 140 | 1880 | 2820 | 4700 |

LS: Language course; EN: English course ; ECA: Extra Curricular Activities; NCC: National Cadet Corps; NSS: National Social Service; DSE : Discipline Specific Elective

Blue – Employability Green – Entrepreneurship Red- Skill Development

| Ability Enhancement Courses (AEC) | | |
|-----------------------------------|-------------|-----------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language – I |
| | 19ENU101 | English |
| II | 19LSU201 | Language – II |
| | 19AEC201 | Environmental Studies |

| Generic Elective Course (GE)/ Allied Course | | |
|---|-------------|--------------------------|
| Semester | Course Code | Name of the Course |
| I | 19BTU103 | Chemistry - I |
| | 19BTU113 | Chemistry Practical - I |
| II | 19BTU202 | Chemistry – II |
| | 19BTU212 | Chemistry Practical - II |

| Core Courses (CC) | | |
|-------------------|-------------|---------------------------------------|
| Semester | Course Code | Name of the Course |
| I | 19BTU101 | Biochemistry and Metabolism |
| | 19BTU102 | Cell Biology |
| | 19BTU111 | Biochemistry and Metabolism Practical |
| | 19BTU112 | Cell Biology Practical |
| II | 19BTU201 | Genetics |
| | 19BTU203 | General Microbiology |
| | 19BTU211 | Genetics Practical |
| | 19BTU213 | General Microbiology Practical |
| III | 19BTU301 | Plant Physiology |
| | 19BTU302 | Molecular Biology |
| | 19BTU303 | Immunology |
| | 19BTU311 | Plant Physiology Practical |
| | 19BTU312 | Molecular Biology Practical |
| | 19BTU313 | Immunology Practical |
| IV | 19BTU401 | Bioprocess Technology |
| | 19BTU402 | Recombinant DNA Technology |
| | 19BTU403 | Genomics and Proteomics |
| | 19BTU411 | Bioprocess Technology Practical |
| | 19BTU412 | Recombinant DNA Technology Practical |
| | 19BTU413 | Genomics and Proteomics Practical |
| VI | 19BTU691 | Project – <i>Viva Voce</i> |

| Skill Enhancement Elective Courses (SEC) | | |
|--|-------------|---|
| Semester | Course Code | Name of the Course |
| III | 19BTU304A | I.P.R., Entrepreneurship, Bioethics and Biosafety |
| | 19BTU304B | Bio - Analytical Tool |
| | 19BTU314A | I.P.R., Entrepreneurship, Bioethics and Biosafety Practical |
| | 19BTU314B | Bio - Analytical Tool Practical |
| IV | 19BTU404A | Industrial Fermentation |
| | 19BTU404B | Enzymology |
| | 19BTU414A | Industrial Fermentation Practical |
| | 19BTU414B | Enzymology Practical |
| V | 19BTU501A | Plant Diversity - I |
| | 19BTU501B | Basics of Forensic Science |
| | 19BTU511A | Plant Diversity Practical - I |

| | | |
|----|-----------|---|
| | 19BTU511B | Basics of Forensic Science Practical |
| VI | 19BTU601A | Molecular Diagnostics |
| | 19BTU601B | Biotechnology and Human Welfare |
| | 19BTU611A | Molecular Diagnostics Practical |
| | 19BTU611B | Biotechnology and Human Welfare Practical |

| Discipline Specific Elective Courses (DSE) | | |
|--|-------------|---------------------------------------|
| Semester | Course Code | Name of the Course |
| V | 19BTU502A | Bioinformatics |
| | 19BTU502B | Plant Diversity - II |
| | 19BTU503A | Plant Biotechnology |
| | 19BTU503B | Evolutionary Biology |
| | 19BTU504A | Animal Biotechnology |
| | 19BTU504B | Animal Diversity - I |
| V | 19BTU512A | Bioinformatics Practical |
| | 19BTU512B | Plant Diversity Practical – II |
| | 19BTU513A | Plant Biotechnology Practical |
| | 19BTU513B | Evolutionary Biology Practical |
| | 19BTU514A | Animal Biotechnology Practical |
| | 19BTU514B | Animal Diversity Practical - I |
| VI | 19BTU602A | Medical Microbiology |
| | 19BTU602B | Environmental Biotechnology |
| | 19BTU603A | Biostatistics |
| | 19BTU603B | Environment Management |
| | 19BTU612A | Medical Microbiology Practical |
| | 19BTU612B | Environmental Biotechnology Practical |
| | 19BTU613A | Biostatistics Practical |
| | 19BTU613B | Environment Management Practical |

PROGRAMME OUTCOMES (POs)

- a) Graduates will acquire in-depth understanding of basic concept, knowledge about biochemistry and cell organelles, their functions for applied field, allied subject and life skills.
- b) The students will be able to discuss the metabolic aspects of biomolecules.
- c) The Graduates will gain the technical capability of handling, isolating and identifying various organisms from different sources.
- d) Understanding and better knowledge of the causes, types and control methods for environmental pollution by the students.
- e) The student will be able to discuss the mechanisms associated with gene expression system in prokaryotes and eukaryotes.
- f) Understand the role of different types of cells, effectors and effectors mechanisms in immune- technology by the students.
- g) Develop skills associated with screening of industrially important strains, various aspects of bioprocess technology and rDNA technology by the graduates.
- h) The student will be able to understand the production of enzymes from different sources and enzyme characterization and kinetic actions in living organisms.
- i) The student will be able to understand the production of transgenic plants and animals for human and environmental welfare.
- j) Understand the basic concepts and modern knowledge of bioinformatics by graduates.
- k) Apply the knowledge and skills gained from molecular aspects should be useful in developing new innovations in different life forms by the graduates.
- l) The student will be able design, solve the application-oriented problem in biotechnological field through project-based learning.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

To enable the student to emerge as:

- m) Proficiency to work on biotechnological concepts and interdisciplinary areas of science and technology towards product and process development for industrial and academic research applications.
- n) An expert in Biotechnology and allied fields (medical, microbial, agricultural, environmental, plant and animal) for utilizing the practical skills to address biotechnological challenges.

- o) Proficiency to demonstrate entrepreneurial and leadership skills with life-long learning

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

To impart the following PEOs to the students of Under-graduates in Biotechnology:

PEO I : To obtain detailed information about the fundamentals of Biotechnology, allied subjects and life skills.

PEO II : To provide information about the molecular methods which involved in cellular processes of living systems such as microbes to higher order organisms for applied aspects. To address the emerging need for skilled scientific manpower with research ethics involving organisms.

PEO III : To impart the basics and current molecular tools in the areas of Molecular Diagnostics, Fermentation Technology, Plant, Animal & Environmental Biotechnology are included to train the students for man power development and also sensitize them to scope for research with inputs of bioinformatics techniques. The practical subjects will provide information about the careers in the industry and applied research where biological system is employed.

PEO IV : To make the graduates of Biotechnology to learn and to adopt in a competitive world of technology update and contribute to all forms of life.

MAPPING OF PEOs WITH POs, PSOs

| PEOs | Programme Outcome (s) | | | | | | | | | | | | | | |
|----------------|------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) |
| PEO I | x | x | x | x | | | | | | | | | | | |
| PEO II | | | | | x | x | x | x | | | | | | | |
| PEO III | | | | | | | | | x | x | x | x | | | |
| PEO IV | | | | | | | | | | | x | x | x | x | x |

DEPARTMENT OF BIOTECHNOLOGY
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS) – M.Sc. Biotechnology
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and Outcomes | | Instruction hours / Week | | | Credit (s) | Marks | | |
|---------------------------------------|---|-------------------------|------------|--------------------------|---|---|------------|-------|-----|-------|
| | | PEO's | PO's | L | T | P | | CIA | ESE | Total |
| SEMESTER - I | | | | | | | | | | |
| 19BTP101 | Fundamentals of Biochemistry and Microbiology | I, II | a, b, c, d | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP102 | Cell Biology and Molecular Genetics | I, II | a, d | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP103 | Ecology, Evolutionary and Developmental Biology | I, II | a, b, c, d | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP104 | Bioinstrumentation and Biostatistics | II, III | d, e, f | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTP105A 19BTP105B 19BTP105C | Biodiversity, Biosafety And IPR Nano-Biotechnology Bio-energy Technology | II, IV | d, g, h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP111 | Fundamentals of Biochemistry and Microbiology - Practical – I | II, III | d, e, f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTP112 | Cell Biology and Molecular Genetics - Practical – II | II, III | d, e, f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | | | 2 | 0 | 0 | - | - | - | - |
| Semester total | | | | 21 | 1 | 8 | 24 | 280 | 420 | 700 |
| SEMESTER - II | | | | | | | | | | |
| 19BTP201 | Recombinant DNA technology | II, III, IV | d, g, h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP202 | Fermentation and Bioprocess Technology | II, III, IV | d, g, h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP203 | Enzyme Technology | IV | g | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTP204 | Immunotechnology | II, III, IV | d, e, f, g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP205A 19BTP205B 19BTP205C | Pharmaceutical Biotechnology Agricultural Biotechnology Industrial Toxicology | IV | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP211 | Recombinant DNA, Fermentation and Bioprocess Technology - Practical – III | IV | g | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTP212 | Immuno and Enzyme Technology - Practical – IV | IV | g | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | | | 2 | 0 | 0 | | - | - | - |
| Semester total | | | | 21 | 1 | 8 | 24 | 280 | 420 | 700 |

| Course code | Name of the course | Objectives and Outcomes | | Instruction hours / Week | | | Credit (s) | Marks | | |
|---------------------------------------|---|-------------------------|------------|--------------------------|---|----|------------|-------|------|-------|
| | | PEO's | PO's | L | T | P | | CIA | ESE | Total |
| SEMESTER - III | | | | | | | | | | |
| 19BTP301 | Plant and Animal Biotechnology | II, III, IV | d, g, h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP302 | Genomics, Proteomics and Bioinformatics | II, III, IV | d, g, h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP303 | Food Biotechnology | IV | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP304 | Environmental Biotechnology | II, III, IV | d, e, f, g | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTP305A 19BTP305B 19BTP305C | Applied Biotechnology System Biology Tissue Engineering and Regenerative Medicine | IV | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BTP311 | Plant and Animal Biotechnology- Practical – V | II, III, IV | d, g, h, f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTP312 | Genomics, Proteomics and Bioinformatics - Practical – VI | II, III, IV | d, g, h, f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | | | 2 | 0 | 0 | - | - | - | - |
| Semester total | | | | 21 | 1 | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – IV | | | | | | | | | | |
| 19BTP491 | Project and Viva Voce | III, IV | f, g, h, i | - | - | - | 15 | 80 | 120 | 200 |
| Semester total | | | | - | - | - | 15 | 80 | 120 | 200 |
| | | | | 42 | 3 | 45 | 87 | 920 | 1380 | 2300 |

Elective courses*

| Elective – 1 (19BTP105) | | Elective – 2 (19BTP205) | | Elective – 3 (19BTP305) | |
|-------------------------|---------------------------------|-------------------------|------------------------------|-------------------------|-----------------------------|
| Course code | Name of the course (Theory) | Course Code | Name of the course (Theory) | Course Code | Name of the course (Theory) |
| 19BTP105A | Biodiversity, Biosafety And IPR | 19BTP205A | Pharmaceutical Biotechnology | 19BTP305A | Applied Biotechnology |
| 19BTP105B | Nano-Biotechnology | 19BTP205B | Agricultural Biotechnology | 19BTP305B | System Biology |
| 19BTP105C | Bio-energy Technology | 19BTP205C | Industrial Toxicology | 19BTP305C | Tissue Engineering |

*Electives are Transborder / cross disciplinary / Discipline centric elective nature.

Blue – Employability Green – Entrepreneurship Red- Skill Development

PROGRAMME OUTCOMES (POs)

- a) Graduates will be able to have knowledge on the basic and applied theories.
- b) Providing a broad educational and analytical knowledge necessary to make the students for appearing in competitive examinations
- c) Ability to design and conduct experiments as well as to interpret the results.
- d) An expert to work on Biotechnological concepts and allied fields (immuno, medical, microbial, Food, agricultural, environmental, plant and animal) with modern tools and techniques towards product and process development for academic, industrial and research application.
- e) Generating the graduates with an ability to identify, formulate and solve to deliver process/product with professional, societal and ethical responsibilities.
- f) Graduates will be able to visualize and work on multidisciplinary laboratory problems.
- g) Graduates will be able to update the current knowledge of interdisciplinary subjects related to biotechnology

PROGRAMME SPECIFIC OUTCOMES (PSOs)

To enable the student to emerge as:

- h) Biotechnologist to recognize the societal need and lifelong learning.
- i) Proficient to demonstrate entrepreneurial and leadership skills with life-long learning.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I: The post-graduates of Biotechnology will be able to acquire in-depth knowledge of the basic and applied subjects of Biotechnology and allied fields.

PEO II: The post-graduates of Biotechnology are equipped to design, analyze, conduct and interpret the experiments and data for the development of process/product within the realistic constraints.

PEO III: The post-graduates of Biotechnology will be able to acquire the knowledge and ability to use the concept of theories, practical skills and recent technological tools in solving any technological and professional issues independently in a global and societal context.

PEO IV: The graduates of Biotechnology will continue learning to update and to become an entrepreneur in a competitive world of technology and also contribute to all forms of life.

MAPPING OF PEOs AND POs

| PEOs | | | Programme Outcome (s) | | | | | | |
|---------|-----|-----|-----------------------|-----|-----|-----|-----|-----|-----|
| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) |
| PEO I | x | x | | | | | | | |
| PEO II | | | x | x | | | | | |
| PEO III | | | | | x | x | | | |
| PEO IV | | | | | | | x | x | x |

B.Sc. CHEMISTRY
CHOICE BASED CREDIT SYSTEM (CBCS)

Syllabus
2019-2020



DEPARTMENT OF CHEMISTRY
FACULTY OF ARTS, SCIENCE AND HUMANITIES

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)
(Established under section 3 of UGC Act, 1956)
Pollachi Main Road, Eachanari (Post), Coimbatore- 641021, Tamil Nadu,
India

Phone: 0422 – 2980011 – 15 Fax No: 0422 – 2980022-23

Email: info@karpagam.com Web: www.kahedu.edu.in

Preamble

Karpagam Academy of Higher Education (KAHE) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of the University. The measures taken to enhance the quality in higher education include innovation and improvements in curriculum, teaching-learning process, and examination and evaluation systems. The grading system is considered to be better than the conventional marks system and is followed. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students.

Choice Based Credit System (CBCS): The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses will be evaluated following the grading system, which is considered to be better than the conventional marks system.

Outline of Choice Based Credit System:

- 1. Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
- 2. Elective Course:** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.
 - 2.1 Generic Elective :** Generic elective is an elective course chosen generally from an unrelated discipline/subject, with an intention to provide exposure in other areas of interest also to students
 - 2.2 Discipline Specific Elective (DSE) Course:** Elective courses offered by the main discipline/subject of study is referred to as Discipline Specific Elective.

2.3 Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 6 credits. A Project/Dissertation work is given in lieu of a discipline specific elective paper.

3. Ability Enhancement Courses (AEC)/Competency Improvement Courses/Skill Development Courses/Foundation Course: The Ability Enhancement (AE) Courses are of two kinds: AE Compulsory Course (AECC) and AE Elective Course (AEEC). “AECC” courses are the courses based upon the content that leads to Knowledge enhancement. They ((i) Environmental Science, (ii) English/MIL Communication) are mandatory courses. AEEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

3.1 AE Compulsory Course (AECC): Environmental Science, English Communication/MIL Communication.

3.2 AE Elective Course (AEEC): These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based instruction.

4. Value Added Courses

Courses of varying durations but not less than 30 hours which are optional and offered outside the curriculum that add value and helping the students in getting placement. Students of all programmes are eligible to enrol for the value added programme. The student shall choose one Value Added Course per semester from the list of Value Added Courses available in KAHE. The examinations shall be conducted at the end of the value added programme at the Department level and the students has to secure a minimum of 50% of marks to get a pass. The certificate for the value added programme for the passed out students shall be issued duly signed by the HOD and Dean of the Faculty concerned.

DEPARTMENT OF CHEMISTRY
FACULTY OF ARTS, SCIENCE AND HUMANITIES

UG PROGRAM (CBCS) – B.Sc. Chemistry
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives & Outcomes | | Instruction hours per week | | | Credits | Maximum Marks | | |
|--------------|---|-----------------------|-----------|----------------------------|---|---|---------|---------------|------|------|
| | | PEO's | PO's | L | T | P | | | CI A | ES E |
| SEMESTER I | | | | | | | | | | |
| 19LSU101 | Language –I | 4 | 7 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ENU 101 | English | 4 | 7 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU101 | Mathematics-I | 1,4 | 1,4,5, 10 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU102 | Inorganic Chemistry I:Atomic structure and Chemical Bonding | 1 | 1,3 | 5 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CHU103 | Organic Chemistry I: Basics and Hydrocarbons | 1 | 1,3 | 5 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CHU111 | Mathematics- I Practical | 2,3 | 2,5,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHU112 | Atomic structure and Chemical Bonding- Practical | 1 | 1,4,1 0 | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CHU113 | Basics and Hydrocarbons- Practical | 1 | 1,4,1 0 | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| | Semester total | | | 22 | | 8 | 26 | 320 | 480 | 800 |
| SEMESTER II | | | | | | | | | | |
| 19LSU201 | Language –II | | | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU201 | Mathematics-II | 1,4 | 1,4,5, 10 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU202 | Physical Chemistry I: Chemical Thermodynamics and its Application | 1,2 | 2,5,1 0 | 5 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CHU203 | Organic Chemistry II: Oxygen Containing Functional Groups | 1,2 | 2,5 | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CHU211 | Mathematics- II Practical | | | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHU212 | Chemical Thermodynamics and its Application- Practical | 1,2,3 | 2,3,4, 9 | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CHU213 | Oxygen Containing Functional Groups- Practical | 1,2,3 | 2,3,4, 9 | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | 2 | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | Semester Total | | | 22 | | 8 | 26 | 320 | 480 | 800 |
| SEMESTER III | | | | | | | | | | |
| 19CHU301 | Physics- I | 1,2,3 | 2,3,4, 10 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU302 | Inorganic Chemistry II: Coordination Chemistry | 1,2,3 | 2,3,4, 10 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU303 | Physical Chemistry II: Phase Equilibria and Chemical Kinetics | 1,2,3 | 2,3,4, 10 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU311 | Physics Practical-I | 1,2,5 | 2,3,4, 9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--------------------|--|-------|------------|-----------|---|-----------|-----------|------------|------------|------------|
| 19CHU312 | Coordination Chemistry- Practical | 1,2 | 2,3,4,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHU313 | Phase Equilibria and Chemical Kinetics- Practical | 1,2 | 2,3,4,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHU304A | Pharmaceutical Chemistry | 1,2,3 | 2,3,6,10 | 03 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CHU304B | IT Skills for Chemists | | | | | | | | | |
| 19CHU314A | Pharmaceutical Chemistry- Practical | 1,2,3 | 2,3,6,10 | 0 | 0 | 3 | 1 | 40 | 60 | 100 |
| 19CHU314B | IT Skills for Chemists- Practical | | | | | | | | | |
| | Semester total | | | 15 | | 15 | 22 | 320 | 480 | 800 |
| SEMESTER IV | | | | | | | | | | |
| 19CHU401 | Physics-II | 2,3 | 2,3,4 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU402 | Physical Chemistry III: Electrochemistry | 1,2,3 | 1,2,4,5,9 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU403 | Organic Chemistry III : Organic Spectroscopy | 1,2,3 | 2,3,4,6 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU411 | Physics Practical- II | 2,5 | 2,3,4 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHU412 | Physical Chemistry III: Electrochemistry- Practical | 1,2,3 | 2,3,4,5,6 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHU413 | Organic Spectroscopy- Practical | 1,2,3 | 2,4,6,7,8 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHU404A | Green Methods in Chemistry | 1,2,3 | 1,3,6,8,9 | 03 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CHU404B | Analytical Clinical Biochemistry | 1,2,3 | 1,2,3,10 | | | | | | | |
| 19CHU414A | Green Methods in Chemistry- Practical | 1,2,3 | 1,3,6,8,9 | 0 | 0 | 3 | 1 | 40 | 60 | 100 |
| 19CHU414B | Analytical Clinical Biochemistry- Practical | 1,2,3 | 1,2,3 | | | | | | | |
| | Semester total | | | 15 | | 15 | 22 | 320 | 480 | 800 |
| SEMESTER V | | | | | | | | | | |
| 19CHU501A | Cheminformatics | 1,2,3 | 1,2,5,8,10 | 03 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CHU501B | Chemistry of Cosmetics and Perfumes | 1,2,3 | 2,3,7 | | | | | | | |
| 19CHU511A | Cheminformatics- Practical | 2,3 | 1,2,5,8 | 0 | 0 | 3 | 1 | 40 | 60 | 100 |
| 19CHU511B | Chemistry of Cosmetics and Perfumes- Practical | 2,3 | 2,3,7,9 | | | | | | | |
| 19CHU502A | Polymer Chemistry | 1,2,3 | 2,3,4,7,8 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU502B | Novel Inorganic Solids | 1,2,3 | 3,4,7 | | | | | | | |
| 19CHU503 | Organic Chemistry IV: Nitrogen containing functional groups, Heterocyclic Chemistry and Natural products | 1,2,3 | 2,3,4,5,6 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU504 | Inorganic Chemistry III: Inorganic Chemistry II: Metallurgy, s-block | 1,2,3 | 2,3,5,7,8 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--|--|---------|-------------|-----------|---|-----------|------------|-------------|-------------|-------------|
| | and p-block Elements | | | | | | | | | |
| 19CHU512A | Polymer Chemistry- Practical | 1,2,3 | 2,3,4,5,6 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHU512B | Novel Inorganic Solids- Practical | 2,3 | 3,4,7,9 | | | | | | | |
| 19CHU513 | Nitrogen containing functional groups, Heterocyclic Chemistry and Natural products – Practical | 1,2,3 | 2,3,9 | 0 | 0 | 04 | 2 | 40 | 60 | 100 |
| 19CHU514 | Inorganic Chemistry II: Metallurgy, s-block and p-block Elements - Practical | | | 0 | 0 | 04 | 2 | 40 | 60 | 100 |
| | Semester Total | | | 15 | | 15 | 22 | 320 | 480 | 800 |
| SEMESTER VI | | | | | | | | | | |
| 19CHU601A | Basic Analytical Chemistry | 1,2,3 | 2,4,5 | 03 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CHU601B | Pesticide Chemistry | 1,2,3 | 3,6,7 | | | | | | | |
| 19CHU611A | Basic Analytical Chemistry- Practical | 1,2,3 | 2,4,5 | 0 | 0 | 3 | 1 | 40 | 60 | 100 |
| 19CHU611B | Pesticide Chemistry- Practical | 1,2,3 | 3,6,7 | | | | | | | |
| 19CHU602 | Inorganic Chemistry IV: Organometallic Chemistry | 1,2,3 | 2,3,4,5,6 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU603 | Physical Chemistry IV: States of Matter and Ionic Equilibrium | 1,2,3 | 2,3,4,5,7 | 04 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHU612 | Organometallic Chemistry- Practical | 1,2 | 2,3,4,9 | 0 | 0 | 04 | 2 | 40 | 60 | 100 |
| 19CHU613 | Physical Chemistry IV: States of Matter and Ionic Equilibrium- Practical | 1,2 | 2,3,4,9 | 0 | 0 | 04 | 2 | 40 | 60 | 100 |
| 19CHU604 | Molecular Modeling and Drug Design | 1,2,3 | 1,3,6,8 | 0 | 0 | 8 | 6 | 40 | 60 | 100 |
| 19CHU614 | Molecular Modeling and Drug Design Practical | 1,2,3 | 2,3,6 | | | | | | | |
| 19CHU691 | Project Work | 1,2,3,4 | 1,2,3,5,6,8 | | | | | | | |
| | | | | 11 | | 19 | 22 | 280 | 420 | 700 |
| ECA / NCC / NSS / Sports / General interest /etc | | | | | | | | | | Good |
| | G. Total | | | | | | 140 | 1880 | 2820 | 4700 |

Programme Outcomes

1. Have firm foundations in the fundamentals and application of current chemical and scientific theories.
2. Are able to design, carry out, record and analyze the results of chemical experiments.
3. Knows the proper procedures and regulations for safe handling and use of chemicals and can follow the proper procedures and regulations for safe handling when using chemicals.
4. Students should have a working knowledge of the main areas of chemistry: organic, inorganic, analytical, and physical.
5. Students should possess critical thinking and problem solving abilities.
6. Students should be able to perform and understand chemical research.
7. Students should be able to describe, both in writing and orally, chemical processes and procedures
8. Students should be able to work in a chemical or related field.

Programme Specific Outcomes

9. Are able to use modern instrumentation and classical techniques, to design experiments, and to properly record the results of their experiment.
10. Students should have a basic level understanding of the following areas of chemistry - Analytical, Inorganic, Organic, and Physical Chemistry.
11. Students should be able to work in a chemical or related field.

Programme Educational Objectives

PEO-1

Acquire the fundamental principles of science and demonstrate broad knowledge of descriptive chemistry and will be able to nurture the needs of industries/laboratories related to chemistry

PEO-2

To motivate critical thinking and analytical skills to solve chemical problems of practical relevance to society while complying with economical, environmental, ethical, and safety factors.

PEO-3

To synthesize, separate and characterize compounds using published reactions, protocols, standard laboratory equipment, and modern instrumentation.

PEO-4

Demonstrate professional excellence, ethics and will be able to communicate effectively the scientific information and research results in written and oral formats, to both professional scientists and to the public.

Mapping

| PO's | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|
| PEO 1 | X | X | X | X | | | X | | X | X | |
| PEO 2 | | | | | X | | X | | X | | |
| PEO 3 | | X | | | | X | | | X | | X |
| PEO 4 | | | | | | X | X | X | | X | X |

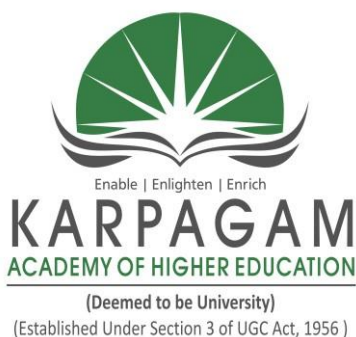
Employability- Blue -20

Entrepreneurship-Green-2

Skill development – Red-35

M.Sc. CHEMISTRY
CHOICE BASED CREDIT SYSTEM (CBCS)

Curriculum
2019-2020



DEPARTMENT OF CHEMISTRY
FACULTY OF ARTS, SCIENCE AND HUMANITIES

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)
(Established under section 3 of UGC Act, 1956)
Pollachi Main Road, Eachanari (Post), Coimbatore- 641021,
Tamil Nadu, India

Phone: 0422 – 2980011 – 15 Fax No: 0422 – 2980022-23
Email: info@karpagam.com Web: www.kahedu.edu.in

Programme Learning Outcomes (PLO)

- a. Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistries.
- b. Students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
- c. Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
- d. Students will be able to clearly communicate the results of scientific work in oral, written and electronic formats to both scientists and the public at large.
- e. Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.
- f. Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.
- g. Students will be able to function as a member of an interdisciplinary problem solving team.
- h. The graduate has specific skills in planning and conducting advanced chemical experiments and applying structural-chemical characterisation techniques.
- i. Are able to use modern instrumentation and classical techniques, to design experiments, and to properly record the results of their experiment.
- j. Are able to use modern library searching and retrieval methods to obtain information about a topic, chemical, chemical technique, or an issue relating to chemistry.

Programme Specific outcome (PSO)

- k. A graduate with a Master's degree in Chemistry has in-depth and detailed functional knowledge of the fundamental theoretical concepts and experimental methods of chemistry.
- l. Students should have an advanced level understanding of the following areas of chemistry - Analytical, Inorganic, Organic, and Physical Chemistry. They should master graduate level understanding of their major area(s) of research.
- m. Students should be able to communicate scientific results in writing and in oral presentation.

- n. Students should become proficient in their specialized area of chemistry and acquire the basic tools needed to carry out independent chemical research

Programme Educational Objectives

PEO-1

The Masters in Chemistry will extend your depth and breadth of knowledge in all branches of chemistry, suitable for a professional chemist capable of conducting research.

PEO-2

To carryout research in the trust areas of chemistry. Will be able to communicate effectively the scientific information and research results in written and oral formats, to both professional scientists and to the public.

PEO-3

To motivate critical thinking and analytical skills to solve complex chemical problems and the Ability to handle problems of practical relevance to society while complying with economical, environmental, ethical, and safety factors.

PEO-4

To practice chemistry by performance of experiments in the laboratory classes. To perform accurate quantitative measurements with an understanding of the theory and use of contemporary chemical instrumentation, interpret experimental results, perform calculations on these results and draw reasonable, accurate conclusions

Mapping

| PO | a | b | c | d | e | f | g | h | i | j | k | l | m | n |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO 1 | x | x | | | x | | | x | x | | x | x | x | |
| PEO 2 | | x | x | x | x | | | x | x | | x | | x | x |
| PEO 3 | | | x | x | | x | x | | | x | | | x | x |
| PEO 4 | x | x | x | | | x | | x | | x | x | x | | x |

DEPARTMENT OF CHEMISTRY
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS) – M.Sc. Chemistry
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives & Outcomes | | Instruction hours per week | | | Cre dits | Maximum Marks | | |
|-------------|--|-----------------------|-----------------|----------------------------|---|---|----------|---------------|-----|------|
| | | PEO's | PO's | L | T | P | | | CIA | ES E |
| SEMESTER I | | | | | | | | | | |
| 19CHP101 | Organic Chemistry – I: Reaction Mechanisms | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP102 | Inorganic Chemistry –I: Nuclear Chemistry and Metallic Clusters | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP103 | Physical Chemistry- I: Quantum Chemistry and Group Theory | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP104 | Organic and Inorganic Spectroscopy | 1,2,3, 4 | 1,2,3, 8,9 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP1058 | Elective I | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP105B | | | | | | | | | | |
| 19CHP105C | | | | | | | | | | |
| 19CHP111 | Organic Chemistry Practical-I: Qualitative Analysis and Single Stage Preparations | 3,4 | 2,8,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHP112 | Organic Chemistry Practical-II: Quantitative Analysis and Double Stage Preparations | 3,4 | 2,8,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | Journal Paper Analysis & Presentation | 1,2,3 | 1,2,3, 4,5,8, 9 | - | - | - | - | - | - | - |
| | Semester total | | | | | | 24 | 280 | 420 | 700 |
| SEMESTER II | | | | | | | | | | |
| 19CHP201 | Organic Chemistry-II: Rearrangements, Reactions, Photochemistry and Pericyclic Reactions | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP202 | Inorganic Chemistry-II: Co-ordination Chemistry | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP203 | Physical Chemistry II: Chemical Kinetics and Electrochemistry | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP204 | Industrial chemicals and environment | 3,4 | 6,8 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP205A | Elective – II | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP205B | | | | | | | | | | |
| 19CHP205C | | | | | | | | | | |

| | | | | | | | | | | |
|---------------|---|-------|-----------------|---|---|---|----|-----|------|------|
| 19CHP211 | Inorganic Chemistry Practical-I: Qualitative Analysis and Preparations | 3,4 | 2,8,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHP212 | Inorganic Chemistry Practical-II: Quantitative Analysis and Complex Preparations | 3,4 | 2,8,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | Journal Paper Analysis & Presentation | 1,2,3 | 1,2,3, 4,5,8, 9 | - | - | - | - | - | - | - |
| 19CHP206 | Water Management | 3 | 6 | 0 | 0 | 0 | 4 | - | 100 | 100 |
| | Semester Total | | | | | | 28 | 280 | 520 | 800 |
| SEMESTER III | | | | | | | | | | |
| 19CHP301 | Organic Chemistry-III (Natural Products) | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19HP302 | Physical Chemistry-III (Thermodynamics) | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP303 | Physical Methods in Chemistry (Instrumentation) | 1,2,3 | 1,3,5, 9,10 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP304 | Nanochemistry | 1,2,3 | 1,3,5, 9 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP305A | Elective -3 (CBCS) | 1,2,3 | 1,3,5 | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CHP305B | | | | | | | | | | |
| 19CHP305C | | | | | | | | | | |
| 19CHP311 | Physical Chemistry Practical I (Molecular Weight Determination and Conductometric Titrations) | 3,4 | 2,8,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CHP312 | Physical Chemistry Practical II (Chemical Kinetics and Potentiometric Titrations) | 3,4 | 2,8,9 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | Journal Paper Analysis & Presentation | 1,2,3 | 1,2,3, 4,5,8, 9 | 2 | - | - | - | - | - | - |
| | Semester total | | | | | | 24 | 280 | 420 | 700 |
| SEMESTER - IV | | | | | | | | | | |
| 19CHP491 | Project and Viva Voce | 2,3,4 | 2,3,4, 8,9,10 | | | | 15 | 80 | 120 | 200 |
| | Semester total | | | | | | 15 | 80 | 120 | 200 |
| | | | | | | | 91 | 920 | 1480 | 2400 |

| List of Core Course Elective | | | | | |
|------------------------------|----------------------------------|-------------|------------------------------------|--------------|----------------------|
| Elective-I | | Elective-II | | Elective-III | |
| Code | Course | Code | Course | Code | Course |
| 19CHP105A | Green Chemistry | 19CHP205A | Research methodology for chemistry | 19CHP305A | Polymer Chemistry |
| 19CHP105B | Medicinal Chemistry | 19CHP205B | Analytical Chemistry | 19CHP305B | Textile Chemistry |
| 19CHP105C | Molecular Modelling& Drug Design | 19CHP205C | Organometallic Chemistry | 19CHP305C | Industrial Chemistry |

Employability-Blue-14

Entrepreneurship- 2

Skill development-7

KARPAGAM ACADEMY OF HIGHER EDUCATION,
(Deemed to be University)
(Established Under Section 3 of UGC Act 1956)
BACHELOR OF COMMERCE
B.Com
(For the Students admitted during the year 2019 – 2022 Batch onwards)

Scheme of Examination

| Course Code | Name of the Course | Objectives and Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
|--------------|---|-------------------------|--------|--------------------------|---|-----|---------|---------------|-----|-------|
| | | PEOs | Pos | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| Semester 1 | | | | | | | | | | |
| 19ENU101 | Language - I | II | b,e,f, | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 18ENU101 | English – I | I, IV | a,g,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMU101 | Financial Accounting | I, IV | a,g,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CMU102 | Business Law | III | c,d,h | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19AEC101 | Business Communication | III | c,d,h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | | | | 28 | 2 | 0 | 26 | 200 | 300 | 500 |
| Semester II | | | | | | | | | | |
| 19ENU201 | Language – II | II | b,e,f, | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 18ENU201 | English – II | I, IV | a,g,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMU201 | Corporate Accounting | III | c,d,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CMU202 | Business Mathematics and Statistics | II | b,e,f, | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | III | c,d,h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | | | | 26 | 4 | 0 | 26 | 200 | 300 | 500 |
| Semester III | | | | | | | | | | |
| 18ENU301 | English – III | I, IV | a,g,i | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CMU301 | Cost Accounting | III | c,d,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CMU302 | Income Tax Law and Practice | II | b,e,f, | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CMU303A | Auditing and Corporate Governance | I, IV | a,g,i | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CMU303B | Computerised Accounting System | II | b,e,f, | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19CMU311A | Auditing and Corporate Governance (practical) | I, IV | a,g,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU311B | Computerised Accounting System (practical) | II | b,e,f, | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | | | | 22/24 | 4 | 4/2 | 22 | 200 | 300 | 500 |
| Semester IV | | | | | | | | | | |
| 18ENU401 | English IV | I, IV | a,g,i | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CMU401 | Indirect Taxation | II | b,e,f, | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CMU402 | Research Methodology | II | b,e,f, | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CMU403A | Financial Analysis and Reporting | I, IV | a,g,i | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CMU403B | Excel for Business | II | b,e,f, | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19CMU411A | Financial Analysis and | I, IV | a,g,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |

| | | | | | | | | | | |
|---|--|-------|--------|-----------|-----|-----|------|------|------|------|
| | Reporting (Practical) | | | | | | | | | |
| 19CMU411B | Excel for Business (Practical) | II | b,e,f, | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | | | | 24/2 2 | 2 | 4/2 | 22 | 200 | 300 | 500 |
| Semester V | | | | | | | | | | |
| 19CMU501A | Company Law | III | c,d,h | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CMU501B | Financial Management | III | c,d,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CMU502A | Financial Services and Capital Markets | II | b,e,f, | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CMU502B | Marketing Management | III | c,d,h | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CMU503A | Management Accounting | III | c,d,h | 5 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMU503B | Advanced Accounting | I, IV | a,g,i | 5 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMU504A | Business Economics | II | b,e,f, | 5 | 1 | 0 | 5 | 40 | 60 | 100 |
| 19CMU504B | Management and Organization Behavior | I, IV | a,g,i | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CMU511A | Financial Services and Capital Markets (Practical) | II | b,e,f, | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU511B | Marketing Management (Practical) | III | c,d,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU512A | Business Economics (Practical) | II | b,e,f, | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU512B | Management and Organization Behavior (Practical) | I, IV | a,g,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| | | | | 25/2 2 | 1/4 | 4 | 22 | 240 | 360 | 600 |
| Semester VI | | | | | | | | | | |
| 19CMU601A | Banking and Insurance | | | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CMU601B | Investment Management | II | b,e,f, | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CMU602A | Human Resource Management | I, IV | a,g,i | 5 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CMU602B | International Business | III | c,d,h | 5 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CMU603A | Entrepreneurship | III | c,d,h | 5 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CMU603B | Personal Selling and Salesmanship | III | c,d,h | 5 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CMU611A | Banking and Insurance (Practical) | I, IV | a,g,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU611B | Investment Management (Practical) | II | b,e,f, | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU612A | Human Resource Management (Practical) | I, IV | a,g,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU612B | International Business (Practical) | III | c,d,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU613A | Entrepreneurship (Practical) | III | c,d,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU613B | Personal Selling and Salesmanship (Practical) | III | c,d,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CMU691 | Project | | | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| | | | | 24 | 0 | 6 | 22 | 280 | 420 | 600 |
| ECA / NCC / NSS / Sports / General interest etc | | | | | | | Good | | | |
| | | | | | | | 140 | 1320 | 1980 | 3300 |

PROGRAM OUTCOMES (PO)

- a. Graduates will demonstrate solid foundation in bookkeeping, accounting and professional fundamentals required to record the business transaction ability.
- b. Graduates will apply IT skills in Accounting, Taxation and business management for effective decision making.
- c. Graduates will obtain the ability to analyse and solve the complex business problems using quantitative; qualitative tools and technologies.
- d. Graduates will exhibit critical thinking skills in understanding the real-time business issues and advocate solutions.
- e. Graduates will acquire and demonstrate the interpersonal and communication skills to convey and negotiate ideas for achieving the common goals.
- f. Graduates will attain and exhibit skills to work as team to take effective decisions in achieving the common goals.
- g. Graduates will demonstrate the leadership skills to initiate, lead and deliver the best performance together with the team members.

PROGRAM SPECIFIC OUTCOMES (PSO)

- h. Graduates will gain lifelong learning practice by identifying, formulating, and analysing complex business problems to reach substantiated conclusions through research considering the changing environmental factors.
- i. Graduate will demonstrate legal, ethical code and socially sustainable code of conduct in both personal and professional decision making process pertaining to their career.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- I. Graduates will acquire knowledge in accounting, taxation, finance and management concepts and apply it in business to become qualified professionals.
- II. Graduates will possess the professional skills and competence to perform effectively in higher studies, jobs and entrepreneurial ventures.
- III. Graduates will develop a lifelong learning by applying the gained knowledge and skills in research and practice.
- IV. Graduates will demonstrate high standard of ethical conduct and become socially responsible citizens contributing to the sustainable growth of the career and the community.

| Program Educational Objectives | Program Outcomes | | | | | | | | |
|--|------------------|---|---|---|---|--------|---|---|---|
| | a | b | c | d | e | f | g | h | i |
| Graduates will acquire knowledge in accounting, taxation, finance, management concepts and computer applications and apply it in business to become qualified professionals. | ✓ | | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| Graduates will possess the professional skills, computer skills and competence in field related to accounting and commerce which will enable them to perform effectively in higher studies, KPO/BPO field of IT sector and entrepreneurial ventures. | ✓ | ✓ | | | ✓ | ✓ ✓ | | | ✓ |
| Graduates will continuously improve accounting and computer skills required to develop a life long learning through IT enabled research and practice. | | | ✓ | ✓ | | | | ✓ | |
| Graduates will demonstrate high standard of ethical conduct in application of computer in accounting and finance and become socially responsible citizens contributing to the sustainable growth of profession and the community. | ✓ | | ✓ | ✓ | | | ✓ | ✓ | ✓ |

BCOM (BPS)
Bachelor of Commerce
(Business Process Services)
CHOICE BASED CREDIT SYSTEM
(CBCS)

Curriculum
2019 – 2020



DEPARTMENT OF COMMERCE
FACULTY OF ARTS, SCIENCE AND HUMANITIES
KARPAGAM ACADEMY OF HIGHER
EDUCATION

(Deemed to be University)
(Established Under Section 3 of UGC Act, 1956)
Pollachi Main Road, Eachanari (Post), Coimbatore – 641 021, Tamil Nadu, India
Phone: 0422- 2980011-2980015, Fax No: 0422 – 2980022 - 23
Email: info@karpagam.com Web: www.kahedu.edu.in

DEPARTMENT OF COMMERCE
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.COM.(BPS)
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|-------------------------|---------------------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19LAU101 | Language - I | I, II, III | a, e | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19ENU101 | English – I | I, II, III | a, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BPU101 | Financial Accounting | I, II, III, IV | a, c, d,e, h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU102 | Management and Organization Behaviour | I, II, III | a, c,d, e,h | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19AEC101 | Business Communication | I, II, III | a, e, g, f | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BPU111 | Management and Organization Behaviour (Practical) | I, II, III | a, c, d,e,f,g, h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 26 | 2 | 2 | 26 | 240 | 360 | 600 |
| SEMESTER – II | | | | | | | | | | |
| 19LAU201 | Language – II | I, II, III | a, e | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19ENU201 | English – II | I, II, III | a, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BPU201 | Business Process Services in Finance and Accounting | I, II, III | a, b,c, d,e, h | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BPU202 | Business Analytics | I, II, III | a, c, d,e, h | 5 | 2 | 0 | 5 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | I, III, IV | a,c,d,e,h , i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BPU211 | Business Process Services in Finance and Accounting (Practical) | I, II, III | a, b, c, d,e, f,g,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BPU212 | Computer Applications for Business (Practical) | I, II, III | a, b, c, d,e,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 24 | 2 | 4 | 25 | 280 | 420 | 700 |
| | | | | | | | | | | |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|-------------------------|---------------------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| | | | | | | | | | | |
| SEMESTER – III | | | | | | | | | | |
| 19BPU301 | Supply Chain Management | I, II, III | a, e | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU302 | Income Tax Law and Practices | I, II, III, IV | a, c, d,e, f,g,h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU303 | Cost and Management Accounting | I, II, III | a, c, d,e, h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU304A | Principles of Auditing | I, II, III, IV | a, c, d,e, h,i | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BPU304B | Business Process Services in Insurance | I, II, III | a, b, c, d,e, h | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BPU311A | Principles of Auditing (Practical) | I, II, III, IV | a, c, d,e, h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BPU311B | Business Process Services in Insurance (Practical) | I, II, III | a, b, c, d,e, f,g,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 22 | 6 | 2 | 22 | 200 | 300 | 500 |
| SEMESTER – IV | | | | | | | | | | |
| 19BPU401 | Indirect Taxation | I, II, III | a, e | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU402 | Campus to Corporate Transition | I, II, III, IV | a, c, d,e, h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU403 | Retail CPG and Market Research | I, II, III | a, b, c, d,e, h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU404A | Financial Analysis and Reporting | I, II, III, IV | a, c, d,e, h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BPU404B | Business Process Services in Banking | I, II, III | a, b, c, d,e,h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BPU411A | Financial Analysis and Reporting (Practical) | I, II, III, IV | a, c, d,e,h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BPU411B | Business Process Services in Banking (Practical) | I, II, III | a, b, c, d,e, f,g,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 22 | 6 | 2 | 23 | 240 | 360 | 600 |
| SEMESTER – V | | | | | | | | | | |
| 19BPU501A | Services Marketing | I, II, III, IV | a, c, d,e,h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|---|---|-------------------------|--------------------|--------------------------|---|------|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BPU501B | Business Process Services in Capital Market | I, II, III | a, b, c, d,e,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU502A | Business Law | I, II, III | a, c, d,e, h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU502B | Managing Business Processes - I | I, II, III | a, b, c, d,e,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU503A | Marketing Management | I, II, III | a, e,h | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BPU503B | Research Methodology | I, II, III | a, b, c, d,e,f,g,h | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BPU504A | Business Economics | I, II, III | a, c,d, e,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU504B | Management Information System | I, II, III, IV | a,c,d,e,h ,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU511A | Marketing Management (Practical) | I, II, III | a, c, d,e,f,g, h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BPU511B | SPSS(Practical) | I, II, III | a, c, d,e,f,g, h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 22 | 6 | 2 | 22 | 200 | 300 | 500 |
| Semester – VI | | | | | | | | | | |
| 19BPU601A | Human Resource Management | I, II, III, IV | a, c, d,e, h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU601B | Managing Business Processes – II | I, II, III, IV | a, b, c, d,e,h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU602A | Company Law | I, II, III | a,e,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU602B | Financial Management | I, II, III | a,e,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BPU603A | Entrepreneurship | I,II, III | a,e,h | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BPU603B | Excel for Business | I, II, III | a, b, c, d,e,h | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BPU611A | Entrepreneurship (Practical) | I, II, III | a, c, d,e,f,g,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BPU611B | Excel for Business (Practical) | I, II, III | a, b, c, d,e,h | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BPU691 | Project | I, II, III | a,b,c,d,e, ,h | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| ECA/NCC/NSS/Sports/General Interest etc | | | | | | | | | | Good |
| Semester Total | | | | 24/ 22 | 4 | 2/ 4 | 22 | 200 | 300 | 500 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|-----------------|--------------------|-------------------------|-----|--------------------------|---|---|-----------|---------------|------|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| Programme total | | | | | | | 140 | 1360 | 2040 | 3400 |

| ABILITY ENHANCEMENT COURSES | | |
|-----------------------------|-------------|------------------------|
| Semester | Course code | Name of the course |
| I | 19ENU101 | English – I |
| I | 19LAU101 | Language - I |
| I | 19AEC101 | Business Communication |
| II | 19ENU201 | English – II |
| II | 19LAU201 | Language – II |
| II | 19AEC201 | Environmental Studies |

| CORE COURSES | | |
|--------------|-------------|--|
| Semester | Course code | Name of the course |
| I | 19BPU101 | Financial Accounting |
| I | 19BPU102 | Management and Organization Behaviour |
| II | 19BPU201 | <i>Business Process Services in Finance and Accounting</i> |
| II | 19BPU202 | Business Analytics |
| III | 19BPU301 | <i>Supply Chain Management</i> |
| III | 19BPU302 | Income Tax Law and Practices |
| III | 19BPU303 | Cost and Management Accounting |
| IV | 19BPU401 | Indirect Taxation |
| | 19BPU402 | <i>Campus to Corporate Transition</i> |
| | 19BPU403 | <i>Retail, CPG and Market Research</i> |
| VI | 19BPU691 | <i>Project</i> |

| SKILL ENHANCEMENT COURSES | | |
|---------------------------|-------------|---|
| Semester | Course code | Name of the course |
| III | 19BPU304A | Principles of Auditing |
| | 19BPU311A | Principles of Auditing(Practical) |
| III | 19BPU304B | <i>Business Process Services in Insurance</i> |
| | 19BPU311B | <i>Business Process Services in Insurance (Practical)</i> |
| IV | 19BPU404A | Financial Analysis and Reporting |
| | 19BPU411A | Financial Analysis and Reporting (Practical) |
| IV | 19BPU404B | <i>Business Process Services in Banking</i> |
| | 19BPU411B | <i>Business Process Services in Banking (Practical)</i> |
| V | 19BPU503A | Marketing Management |
| | 19BPU511A | Marketing Management (Practical) |
| V | 19BPU504B | Research Methodology |
| | 19BPU511B | SPSS (Practical) |
| VI | 19BPU603A | Entrepreneurship |
| | 19BPU611A | Entrepreneurship (Practical) |
| VI | 19BPU603B | <i>Excel for Business</i> |
| | 19BPU611B | <i>Excel for business (Practical)</i> |

| DISCIPLINE SPECIFIC ELECTIVES | | |
|-------------------------------|-------------|--|
| Semester | Course code | Name of the course |
| V | 19BPU501A | Service Marketing |
| | 19BPU501B | <i>Business Process Services in Capital Market</i> |
| | 19BPU502A | Business Law |
| | 19BPU502B | <i>Managing Business Processes - I</i> |
| VI | 19BPU601A | Human Resource Management |
| | 19BPU601B | <i>Managing Business Processes – II</i> |

| GENERIC ELECTIVE | | |
|------------------|-------------|-------------------------------|
| Semester | Course code | Name of the course |
| V | 19BPU504A | <i>Business Economics</i> |
| | 19BPU504B | Management Information System |
| VI | 19BPU602A | Company Law |
| | 19BPU602B | <i>Financial Management</i> |

PROGRAM OUTCOMES (PO)

- a. Graduates will have a solid foundation in bookkeeping, accounting, business process services and professional fundamentals required to perform in business scenarios.
- b. Graduates will apply the knowledge of ITes domain skills in accounting, taxation, business process domain and business management for enabling effective decision making.
- c. Graduates will obtain the ability to analyze and solve complex business problems using in-depth domain knowledge by using quantitative; qualitative tools and techniques.
- d. Graduates will exhibit critical thinking skills to understand real-time issues in the business process services domain and advocate solutions.
- e. Graduates will acquire and demonstrate interpersonal and communication skills to convey and negotiate ideas to work in teams for achieving the target in specified time.
- f. Graduates will attain and exhibit skills to work as team to take effective decisions in achieving the common goals.
- g. Graduates will demonstrate the leadership skills to initiate, lead and deliver the best performance together with the team members.

PROGRAM SPECIFIC OUTCOMES (PSO)

- h. Graduates will apply a lifelong learning gained through knowledge and skills in continuous adaption of new technologies and the changes in environment factors pertaining to accounting, IT, and finance domain applicable to all industry and specific knowledge and skills catering to ITes sector.
- i. Graduates will demonstrate legal, ethical code and socially sustainable code of conduct in both personal and professional decision making process pertaining to all industry and specific knowledge and skills catering to ITes sector.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- I. Graduates will acquire knowledge in accounting, taxation, finance, business process services and management concepts and apply it in business to become qualified professionals.
- II. Graduates will possess the obtain industry ready professional skills and competence to perform effectively in higher studies, jobs in the various domain of ITes sector, entrepreneurial ventures.
- III. Graduates will continuously develop a lifelong learning to excel in career obtained through domain specific research and practice.
- IV. Graduates will demonstrate high standard of ethical conduct and become socially responsible citizens contributing to the sustainable growth of profession and the community.

| Program Educational Objectives | Program Outcomes | | | | | | | | |
|--|------------------|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i |
| Graduates will acquire knowledge in accounting, taxation, finance, business process services and management concepts and apply it in business to become qualified professionals. | √ | | √ | √ | | | | √ | |
| Graduates will possess the obtain industry ready professional skills and competence to perform effectively in higher studies, jobs in the various domain of ITeS sector, entrepreneurial ventures. | √ | √ | √ | √ | √ | √ | √ | | √ |
| Graduates will continuously develop a lifelong learning to excel in career obtained through domain specific research and practice. | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Graduates will demonstrate high standard of ethical conduct and become socially responsible citizens contributing to the sustainable growth of profession and the community. | | √ | √ | √ | √ | √ | √ | √ | √ |

DEPARTMENT OF COMMERCE
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.COM. (CA)
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|-------------------------|-------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19LAU101 | Language - I | C,d,h | I,III | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19ENU101 | English – I | A,f,i | IV | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CCU101 | Financial Accounting | A,f,i | IV | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CCU102 | Introduction to Information Technology | C,d,h | I,III | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19AEC101 | Business Communication | C,d,h | I,III | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CCU111 | Introduction to Information Technology (Practical) | A,f,i | IV | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 24 | 2 | 4 | 26 | 240 | 360 | 600 |
| SEMESTER – II | | | | | | | | | | |
| 19LAU201 | Language – II | C,d,h | I,III | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19ENU201 | English – II | A,f,i | IV | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CCU201 | Business Law | C,d,h | I,III | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CCU202 | Business Mathematics and Statistics | A,f,i | IV | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | b,e,g | II | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| Semester Total | | | | 28 | 2 | 0 | 26 | 200 | 300 | 500 |
| SEMESTER – III | | | | | | | | | | |
| 19ENU301 | English – III | A,f,i | IV | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CCU301 | Corporate Accounting | A,f,i | IV | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CCU302 | Database Management System | b,e,g | II | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CCU303A | Auditing and Corporate Governance | b,e,g | II | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CCU303B | Computerised Accounting System | A,f,i | IV | 2 | 0 | 0 | 2 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|-------------------------|-------|--------------------------|---|-----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19CCU311 | Database Management System (Practical) | b,e,g | II | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CCU312A | Auditing and Corporate Governance (practical) | A,f,i | IV | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU312B | Computerised Accounting System (practical) | C,d,h | I,III | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 22/20 | 2 | 6/8 | 22 | 240 | 360 | 600 |
| SEMESTER – IV | | | | | | | | | | |
| 19ENU401 | English – IV | A,f,i | IV | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CCU401 | Research Methodology | b,e,g | II | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CCU402 | Cost Accounting | A,f,i | IV | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CCU403A | Financial Analysis and Reporting | C,d,h | I,III | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CCU403B | HTML Programming | C,d,h | I,III | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19CCU411 | Research Methodology (Practical) | b,e,g | II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU412A | Financial Analysis and Reporting (Practical) | b,e,g | II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU412B | HTML Programming (Practical) | A,f,i | IV | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 24/26 | 2 | 4/2 | 22 | 200 | 300 | 500 |
| SEMESTER – V | | | | | | | | | | |
| 19CCU501A | Company Law | C,d,h | I,III | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19CCU501B | Financial Management | A,f,i | IV | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CCU502A | Management Accounting | A,f,i | IV | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CCU502B | Advanced Accounting | C,d,h | I,III | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19CCU503A | Object Oriented Programming with C++ | C,d,h | I,III | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19CCU503B | Investment Management | b,e,g | II | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CCU504A | Business Economics | C,d,h | I,III | 6 | 0 | 0 | 5 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|-------------------------|-------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19CCU504B | Management and Organization Behaviour | b,e,g | II | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CCU511A | Object Oriented Programming with C++ (Practical) | A,f,i | IV | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CCU511B | Investment Management (Practical) | b,e,g | II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU512A | Business Economics (Practical) | b,e,g | II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU512B | Management and Organization Behaviour (Practical) | A,f,i | IV | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 23/20 | ¼ | 6 | 22 | 240 | 360 | 600 |
| SEMESTER – VI | | | | | | | | | | |
| 19CCU601A | Taxation | b,e,g | II | 4 | 2 | 0 | 5 | 40 | 60 | 100 |
| 19CCU601B | Internet and Web designing | C,d,h | I,III | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CCU602A | Entrepreneurship | b,e,g | II | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CCU602B | Personal Selling and Salesmanship | A,f,i | IV | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CCU603A | Human Resource Management | A,f,i | IV | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CCU603B | Management Information system | b,e,g | II | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19CCU611A | Taxation (Practical) | b,e,g | II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU611B | Internet and Web designing | C,d,h | I,III | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19CCU612A | Entrepreneurship (Practical) | b,e,g | II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU612B | Personal Selling and Salesmanship (Practical) | A,f,i | IV | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU613A | Human Resource Management (Practical) | A,f,i | IV | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19CCU613B | Management Information system (Practical) | A,f,i | IV | 0 | 0 | 2 | 1 | 40 | 60 | 100 |

| 19CCU691 | Project | b,e,g | II | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
|---|--------------------|-------------------------|-----|--------------------------|-----|-----|-----------|---------------|-----------|-----------|
| ECA/NCC/NSS/Sports/General Interest etc | | | | | | | | | | Good |
| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| Semester Total | | | | 22 | 2/0 | 6/8 | 22 | 240/280 | 360/420 | 600/700 |
| Programme Total | | | | | | | 140 | 1360/1400 | 2040/2100 | 3400/3500 |



PROGRAM OUTCOMES [PO]

- a. Graduates will have solid foundation in bookkeeping, accounting, computers and professional fundamentals required to record the business transaction ability.
- b. Graduates will apply technological skills in accounting, taxation by creating and applying the appropriate software and software tools for business management.
- c. Graduates will obtain the ability to analyze and develop programs for system based applications which will help in solving complex business problems to make effective decisions.
- d. Graduates will exhibit critical thinking skills in understanding the real-time business issues and advocate solutions.
- e. Graduates will acquire and demonstrate the interpersonal and communication skills to convey and negotiate ideas for achieving the common goals.
- f. Graduates will attain and exhibit skills to work as team to take effective decisions in achieving the common goals.
- g. Graduates will demonstrate the leadership skills to initiate, lead and deliver the best performance together with the team members.

PROGRAM SPECIFIC OUTCOMES (PSO)

- h. Graduates will apply a lifelong learning gained through knowledge and skills in continuous adaption of new technologies and the changes in environment factors pertaining to accounting, IT, and finance.
- i. Graduates will demonstrate legal, ethical compliance (including IT norms) and socially sustainable code of conduct in both personal and professional decision making process.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- I. Graduates will acquire knowledge in accounting, taxation, finance, management concepts and computer applications and apply it in business to become qualified professionals.
- II. Graduates will possess the professional skills, computer skills and competence in field related to accounting and commerce which will enable them to perform effectively in higher studies, KPO/BPO field of IT sector and entrepreneurial ventures.
- III. Graduates will continuously improve accounting and computer skills required to develop a lifelong learning through IT enabled research and practice.
- IV. Graduates will demonstrate high standard of ethical conduct in application of computer in accounting and finance and become socially responsible citizens contributing to the sustainable growth of profession and the community.

| Program Educational Objectives | Program Outcomes | | | | | | | | |
|--|------------------|---|---|---|---|---|---|---|---|
| | a | b | c | D | e | f | g | h | i |
| Graduates will acquire knowledge in accounting, taxation, finance, management concepts and computer applications and apply it in business to become qualified professionals. | | | √ | √ | | | | √ | |
| Graduates will possess the professional skills, computer skills and competence in field related to accounting and commerce which will enable them to perform effectively in higher studies, KPO/BPO field of IT sector and entrepreneurial ventures. | √ | | | | | √ | | | √ |
| Graduates will continuously improve accounting and computer skills required to develop a lifelong learning through IT enabled research and practice. | | | √ | √ | | | | √ | |
| Graduates will demonstrate high standard of ethical conduct in application of computer in accounting and finance and become socially responsible citizens contributing to the sustainable growth of profession and the community. | | √ | | | √ | | √ | | |

B.Com PA
Bachelor of Commerce
CHOICE BASED CREDIT SYSTEM (CBCS)

Curriculum

2019 – 2020



DEPARTMENT OF COMMERCE

FACULTY OF ARTS, SCIENCE AND HUMANITIES

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act, 2056)

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DEPARTMENT OF COMMERCE

FACULTY OF ARTS, SCIENCE AND HUMANITIES

DEPARTMENT OF COMMERCE
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.COM.(PA)
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | | | | | | | | | |
|----------------|---|-------------------------|----------------------|--------------------------|---|-----|-----------|---------------|-----|-----|---|---|---|---|---|---|---|---|
| | | PEO s | POs | L | T | P | | C | I | A | E | S | E | T | o | t | a | l |
| | | | | | | | | | | | | | | | | | | |
| SEMESTER - I | | | | | | | | | | | | | | | | | | |
| 19LAU101 | Language - I | I, II, III | a, e | 6 | 0 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19ENU101 | English – I | I, II, III | a, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 | | | | | | | | |
| 19PAU101 | Financial Accounting | I, II, III, IV | a, c, d,e, h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19PAU102 | Business Law | I,III,IV | a,c,d,e,h,i | 8 | 0 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19AEC101 | Business Communication | I, II, III | a, e, g, f | 4 | 0 | 0 | 4 | 40 | 60 | 100 | | | | | | | | |
| Semester Total | | | | 28 | 2 | 0 | 26 | 200 | 300 | 500 | | | | | | | | |
| SEMESTER – II | | | | | | | | | | | | | | | | | | |
| 19LAU201 | Language – II | I, II, III | a, e | 6 | 0 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19ENU201 | English – II | I, II, III | a, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 | | | | | | | | |
| 19PAU201 | Corporate Accounting | I, II, III, IV | a, c, d,e, h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19PAU202 | Business Mathematics and Statistics | I, II, III | a, c, d,e, h | 6 | 3 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19AEC201 | Environmental Studies | I,III, IV | a, e,h, i | 3 | 0 | 0 | 3 | 40 | 60 | 100 | | | | | | | | |
| Semester Total | | | | 25 | 5 | 0 | 25 | 200 | 300 | 500 | | | | | | | | |
| SEMESTER – III | | | | | | | | | | | | | | | | | | |
| 19ENU301 | English – III | I, II, III | a, e | 4 | 0 | 4 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19PAU301 | Cost Accounting | I, II, III | a, c, e, d, h | 6 | 2 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19PAU302 | Income Tax Law and Practice | I, II, III, IV | a, c, d,e, h,i | 6 | 2 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19PAU303A | Auditing and Corporate Governance | I, II, III, IV | a, c, d,e, h,i | 4 | 0 | 0 | 3 | 40 | 60 | 100 | | | | | | | | |
| 19PAU303B | Computerised Accounting System | I, II, III, IV | a, e, h,i | 2 | 0 | 0 | 2 | 40 | 60 | 100 | | | | | | | | |
| 19PAU311A | Auditing and Corporate Governance (Practical) | I, II, III, IV | a, c, d,e, f, g, h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 | | | | | | | | |
| 19PAU311B | Computerised Accounting System (practical) | I, II, III, IV | a, b, c, d,e, h,i | 0 | 0 | 4 | 2 | 40 | 60 | 100 | | | | | | | | |
| Semester Total | | | | 20/18 | 4 | 6/8 | 22 | 200 | 300 | 500 | | | | | | | | |
| SEMESTER – IV | | | | | | | | | | | | | | | | | | |
| 19ENU401 | English – IV | I, II, III | a, e | 4 | 0 | 4 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19PAU401 | Research Methodology | I, II, III, IV | a, c, d,e,h | 6 | 0 | 0 | 6 | 40 | 60 | 100 | | | | | | | | |
| 19PAU402 | Indirect Taxation | I, II, III, IV | a, c, d,e, h,i | 6 | 0 | 0 | 5 | 40 | 60 | 100 | | | | | | | | |
| 19PAU403A | Financial Analysis and Reporting | I, II, III, IV | a, c, d,e, h,i | 4 | 0 | 0 | 3 | 40 | 60 | 100 | | | | | | | | |
| 19PAU403B | Excel for Business | I, II, III | a, c, d,e,h | 2 | 0 | 0 | 2 | 40 | 60 | 100 | | | | | | | | |
| 19PAU411 | Research Methodology (Practical) | I, II, III, IV | a, c, d,e,f, g,h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 | | | | | | | | |
| 19PAU412 | Indirect Taxation | I, II, III, | a, c, d,e, h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 | | | | | | | | |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|-----------------------|---|-------------------------|--------------------|--------------------------|------------|--------------|-----------|---------------|------------|------------|
| | | PEOs | POs | L | T | P | | C | I | A |
| | | | | | | | | 40 | 60 | 100 |
| | (Practical) | IV | | | | | | | | |
| 19PAU413A | Financial Analysis and Reporting (Practical) | I, II, III, IV | a, c, d,e, h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU413B | Excel for Business (practical) | I, II, III | a, b, c, d,e,h | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 20/19 | 0 | 12/12 | 23 | 280 | 420 | 700 |
| SEMESTER V | | | | | | | | | | |
| 19PAU501A | Company Law | I, II, III, IV | a, c, d,e,f,g, h,i | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19PAU501B | Financial Management | I, II, III | a, c, d,e, f,g,h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19PAU502A | Management Accounting | I, II, III | a, c, d,e, h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19PAU502B | Advanced Accounting | I, II, III | a, c, d,e, h | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19PAU503A | Marketing Management | I, II, III | a, e,h | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PAU503B | Investment Management | I, II, III | a, e, h | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PAU504A | Business Economics | I, II, III | a, c,d, e,h | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19PAU504B | Management and Organization Behaviour | I, II, III | a, c,d, e,h | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19PAU511A | Marketing Management (Practical) | I, II, III | a, c, d,e,f,g, h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU511B | Investment Management (Practical) | I, II, III | a, c, d,e, h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU512A | Business Economics (Practical) | I, II, III | a, c, d,e,f,g, h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU512B | Management and Organization Behaviour (Practical) | I, II, III | a, c, d,e,f,g, h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 24/22 | 2/4 | 4 | 22 | 240 | 360 | 600 |
| SEMESTER – VI | | | | | | | | | | |
| 19PAU601A | Banking Law and Practice | I, II, III, IV | a,e,h,i | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19PAU601B | Insurance Law and Practice | I, II, III, IV | a,e,h,i | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19PAU602A | Entrepreneurship | I, II, III | a,e,h | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PAU602B | Personal Selling and Salesmanship | I, II, III | a,e,h | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PAU603A | Information System Control and Audit | I, II, III, IV | a,e,h,i | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19PAU603B | Strategic Management | I, II, III | a,c,d e,h | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19PAU611A | Banking Law and Practice (Practical) | I, II, III, IV | a,c,d,e,h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU611B | Insurance Law and Practice (Practical) | I, II, III, IV | a,c,d,e,,h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU612A | Entrepreneurship (practical) | I, II, III | a, c, d,e,f,g,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU612B | Personal Selling and Salesmanship (practical) | I, II, III | a, c, d,e,f,g,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|---|--|-------------------------|--------------------|--------------------------|---|---|-----------|---------------|------|------|
| | | PEO's | POs | L | T | P | | C | I | A |
| | | | | | | | | 40 | 60 | 100 |
| 19PAU613A | Information System Control and Audit (Practical) | I, II, III, IV | a,c,d,e,h,i | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU613B | Strategic Management (Practical) | I, II, III | a, c, d,e,f,g,h | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19PAU691 | Project | I, II, III | a, b, c, d,e,f,g,h | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| ECA/NCC/NSS/Sports/General Interest etc | | | | | | | | | | Good |
| Semester Total | | | | 24 | 0 | 6 | 22 | 280 | 420 | 700 |
| Programme Total | | | | | | | 140 | 1400 | 2100 | 3500 |

| ABILITY ENHANCEMENT COURSES | | |
|------------------------------------|-------------|---|
| Semester | Course code | Name of the course |
| I | 19ENU101 | English – I |
| I | 19LAU101 | Language - I |
| I | 19AEC101 | Business Communication |
| II | 19ENU201 | English – II |
| II | 19LAU201 | Language – II |
| II | 19AEC201 | Environmental Studies |
| III | 19ENU301 | English – III |
| IV | 19ENU401 | English – IV |
| CORE COURSES (CC) | | |
| Semester | Course code | Name of the course |
| I | 19PAU101 | Financial Accounting |
| I | 19PAU102 | Business Law |
| II | 19PAU201 | Corporate Accounting |
| II | 19PAU202 | Business Mathematics and Statistics |
| III | 19PAU301 | Cost Accounting |
| III | 19PAU302 | Income Tax Law and Practice |
| IV | 19PAU401 | Research Methodology |
| | 19PAU411 | Research Methodology (Practical) |
| IV | 19PAU402 | Indirect Taxation |
| | 19PAU412 | Indirect Taxation (Practical) |
| SKILL ENHANCEMENT ELECTIVE COURSES | | |
| Semester | Course code | Name of the course |
| III | 19PAU303A | Auditing and Corporate Governance |
| | 19PAU311A | Auditing and Corporate Governance (practical) |
| III | 19PAU303B | Computerised Accounting System |
| | 19PAU311B | Computerised Accounting System (practical) |
| IV | 19PAU403A | Financial Analysis and Reporting |
| | 19PAU413A | Financial Analysis and Reporting (Practical) |
| IV | 19PAU403B | Excel for Business |
| | 19PAU413B | Excel for Business (Practical) |

| | | |
|--------------------------------------|--------------------|---|
| V | 19PAU503A | Marketing Management |
| | 19PAU511A | Marketing Management (Practical) |
| V | 19PAU503B | Investment Management |
| | 19PAU511B | Investment Management (Practical) |
| VI | 19PAU602A | Entrepreneurship |
| | 19PAU612A | Entrepreneurship (practical) |
| VI | 19PAU602B | Personal Selling and Salesmanship |
| | 19PAU612B | Personal Selling and Salesmanship (practical) |
| DISCIPLINE SPECIFIC ELECTIVES | | |
| Semester | Course code | Name of the course |
| V | 19PAU501A | Company Law |
| | 19PAU501B | Financial Management |
| | 19PAU502A | Management Accounting |
| | 19PAU502B | Advanced Accounting |
| VI | 19PAU601A | Banking Law and Practice |
| | 19PAU611A | Banking Law and Practice (Practical) |
| | 19PAU601B | Insurance Law and Practice |
| | 19PAU611B | Insurance Law and Practice (Practical) |
| | 19PAU691 | Project |
| GENERAL ELECTIVE | | |
| Semester | Course code | Name of the course |
| V | 19PAU504A | Business Economics |
| | 19PAU512A | Business Economics (Practical) |
| | 19PAU504B | Management and Organization Behaviour |
| | 19PAU512B | Management and Organization Behaviour (Practical) |
| VI | 19PAU603A | Information Systems Control and Audit |
| | 19PAU613A | Information Systems Control and Audit (Practical) |
| | 19PAU603B | Strategic Management |
| | 19PAU613B | Strategic Management (Practical) |

B. COM. (PA) : THREE-YEAR (6-SEMESTER) CBCS PROGRAMME
PROGRAMME STRUCTURE

| Course code | Name of the course | Course Type |
|---------------------|-------------------------------------|----------------------------|
| SEMESTER I | | |
| 19LAU101 | Language - I | Ability Enhancement Course |
| 19ENU101 | English – I | Ability Enhancement Course |
| 19PAU101 | Financial Accounting | Core Course – I |
| 19PAU102 | Business Law | Core Course - II |
| 19AEC101 | Business Communication | Ability Enhancement Course |
| SEMESTER II | | |
| 19LAU201 | Language – II | Ability Enhancement Course |
| 19ENU201 | English – II | Ability Enhancement Course |
| 19PAU201 | Corporate Accounting | Core Course – III |
| 19PAU202 | Business Mathematics and Statistics | Core Course - IV |
| 19AEC201 | Environmental Studies | Ability Enhancement course |
| SEMESTER III | | |
| 19ENU301 | English – III | Ability Enhancement Course |

| Course code | Name of the course | Course Type |
|--------------------|---|--|
| 19PAU301 | Cost Accounting | Core Course V |
| 19PAU302 | Income Tax Law and Practice | Core Course VI |
| 19PAU303A | Auditing and Corporate Governance | Skill Enhancement Elective Course - I |
| 19PAU311A | Auditing and Corporate Governance (practical) | |
| 19PAU303B | Computerised Accounting System | |
| 19PAU311B | Computerised Accounting System (practical) | |
| SEMESTER IV | | |
| 19ENU401 | English – IV | Ability Enhancement Course |
| 19PAU401 | Research Methodology | Core Course VII |
| 19PAU411 | Research Methodology (Practical) | |
| 19PAU402 | Indirect Taxation | Core Course VIII |
| 19PAU412 | Indirect Taxation (Practical) | |
| 19PAU403A | Financial Analysis and Reporting | Skill Enhancement Elective Course - II |
| 19PAU413A | Financial Analysis and Reporting (Practical) | |
| 19PAU403B | Excel for Business | |
| 19PAU413B | Excel for Business (Practical) | |
| SEMESTER V | | |
| 19PAU501A | Company Law | Discipline Specific Elective (DSE)-I |
| 19PAU501B | Financial Management | |
| 19PAU502A | Management Accounting | Discipline Specific Elective (DSE)-II |
| 19PAU502B | Advanced Accounting | |
| 19PAU503A | Marketing Management | Skill Enhancement Elective Course – III |
| 19PAU511A | Marketing Management (Practical) | |
| 19PAU503B | Investment Management | |
| 19PAU511B | Investment Management (Practical) | |
| 19PAU504A | Business Economics | Generic Elective (GE) – I |
| 19PAU512A | Business Economics (Practical) | |
| 19PAU504B | Management and Organization Behaviour | |
| 19PAU512B | Management and Organization Behaviour (Practical) | |
| SEMESTER VI | | |
| 19PAU601A | Banking Law and Practice | Discipline Specific Elective (DSE)-III |
| 19PAU611A | Banking Law and Practice(Practical) | |
| 19PAU601B | Insurance Law and Practice | |
| 19PAU611B | Insurance Law and Practice(Practical) | |
| 19PAU602A | Entrepreneurship | Skill Enhancement Elective Course – IV |
| 19PAU612A | Entrepreneurship (practical) | |
| 19PAU602B | Personal Selling and Salesmanship | |
| 19PAU612B | Personal Selling and Salesmanship (practical) | |
| 19PAU603A | Information Systems Control and Audit | Generic Elective (GE) – II |
| 19PAU613A | Information Systems Control and Audit (Practical) | |
| 19PAU603B | Strategic Management | |
| 19PAU613B | Strategic Management (Practical) | |
| 19PAU691 | Project | Discipline Specific Elective (DSE)-IV |

PROGRAM OUTCOMES [PO]

- a. Graduates will have a knowledge in bookkeeping, accounting, compliance abiding norms of financial services industry.
- b. Graduates will apply the IT skills in accounting, taxation and finance career for effective decision making.
- c. Graduates will obtain ability to analyze and solve the complex business problems with professional expertise and accuracy using quantitative and qualitative tools and techniques for effective decision making.
- d. Graduates will exhibit critical thinking skills to understand the accuracy in financial reporting, real-time business issues and advocate suitable solutions.
- e. Graduates will acquire and demonstrate the interpersonal and communication skills to convey the audited findings and negotiate for the conformity of the results got through in-depth analysis.
- f. Graduates will attain and exhibit skills to work as team to take effective decisions in achieving the common goals.
- g. Graduates will demonstrate the leadership skills to initiate, lead and deliver the best performance together with the team members.

PROGRAM SPECIFIC OUTCOMES (PSO)

- h. Graduates will apply a lifelong learning in research and practice gained through knowledge and skills in continuous adaption of the changes in environment factors pertaining to accounting, auditing, and finance.
- i. Graduates will demonstrate legal, ethical compliance and socially sustainable code of conduct in both personal and professional decision making process.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- I. Graduates will gain knowledge of accounting, taxation, auditing, finance and management to perform effectively in professional courses like CA, CMA, CS, ICWA and other courses.
- II. Graduates will obtain and demonstrate skills pertaining to professional courses to perform effectively in studies, jobs and entrepreneurial ventures.
- III. Graduates will develop a life-long learning by applying the gained knowledge and skills in Professional practice and research.
- IV. Graduates will demonstrate high standard of ethical conduct and become socially responsible citizens contributing to the sustainable growth of profession and the community.

| Program Educational Objectives | Program Outcomes | | | | | | | | |
|--|------------------|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i |
| Graduates will gain knowledge of accounting, taxation, auditing, finance and management to perform effectively in professional courses like CA, CMA, CS, ICWA and other courses. | √ | √ | √ | √ | | | | | |
| Graduates will obtain and demonstrate skills pertaining to professional courses to perform effectively in studies, jobs and entrepreneurial ventures. | | √ | √ | √ | √ | √ | √ | √ | √ |
| Graduates will develop a lifelong learning by applying the gained knowledge and skills in Professional practice and research. | √ | √ | √ | √ | √ | √ | | √ | |
| Graduates will demonstrate high standard of ethical conduct and become socially responsible citizens contributing to the sustainable growth of profession and the community. | | | | √ | √ | √ | √ | √ | √ |

**KARPAGAM ACADEMY OF HIGHER EDUCATION,
(Deemed to be University)
(Established Under Section 3 of UGC Act 1956)
MASTER OF COMMERCE (Computer Applications)
M.Com.**

Scheme of Examination

| Course Code | Name of the Course | Objectives and Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
|--------------|---|-------------------------|--------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEOs | Pos | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| Semester 1 | | | | | | | | | | |
| 19CMP101 | Managerial Economics | IV | b,g,h,i | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP102 | Management Accounting | IV | b,g,h,i | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP103 | Statistical Analysis | IV | b,g,h,i | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP104 | Advanced Corporate Accounting | I,II, IV | a,e, b,g,h,i | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP105A | Indian Financial System | IV | b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP105B | Organization Behavior | I,II | a,e, | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP105C | Consumer Behaviour | IV | b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP106 | Corporate Law | IV | b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP111 | Computer Application for Accounting (Practical) | I, II, III | a,e,c,d,f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | Journal Paper Analysis and Presentation | III | c,d,f | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 22 | 4 | 4 | 26 | 280 | 420 | 700 |
| Semester II | | | | | | | | | | |
| 19CMP201 | Corporate Finance | I,II | a,e, | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP202 | Operations Research | IV | b,g,h,i | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP203 | Applied Cost Accounting | IV | b,g,h,i | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP204 | Financial Markets and Institutions | IV | b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP205A | Security Analysis and Portfolio Management | III | c,d,f | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP205B | Human Resource Management | I,II | a,e, | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP205C | Advertising and Sales Promotion | III | c,d,f | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP206 | Direct Taxation | III | c,d,f | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| | Journal Paper Analysis and Presentation | III | c,d,f | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 22 | 4 | 4 | 26 | 320 | 480 | 800 |
| Semester III | | | | | | | | | | |

| | | | | | | | | | | |
|--------------------|--|-----------|-------------|-----------|----------|----------|-----------|-------------|-------------|-------------|
| 19CMP301 | Financial Reporting and Analysis | I, II, IV | a,e,b,g,h,i | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP302 | Business Research Methods and Techniques | III | c,d,f | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP303 | Indirect Taxation | III | c,d,f | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19CMP304 | Financial Services | I,II, IV | a,e,b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP305A | Insurance and Risk Management | I,II | a,e, | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP305B | Human Resource Development | I,II, IV | a,e,b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP305C | Retail Management | IV | b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP306 | International Business | IV | b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP311 | SPSS (Practical) | III | c,d,f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | Journal Paper Analysis and Presentation | III | c,d,f | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 23 | 3 | 4 | 26 | 280 | 420 | 700 |
| Semester IV | | | | | | | | | | |
| 19CMP401 | Corporate Governance, Ethics and Social Responsibility | IV | b,g,h,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19CMP402 | Entrepreneurial Development | IV | b,g,h,i | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19CMP491 | Project | III | c,d,f | 0 | 0 | 20 | 8 | 40 | 60 | 100 |
| | Journal Paper Analysis and Presentation | III | c,d,f | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 10 | 0 | 20 | 15 | 160 | 240 | 400 |
| | | | | | | | | | | |
| | | | | | | | 93 | 1040 | 1560 | 2600 |

PROGRAMME OUTCOMES (PO)

- a) Postgraduates will develop an understanding of various commerce functions such as finance, accounting, financial analysis, project evaluation, cost accounting.
- b) Postgraduates will have exposure to solve complex commerce problems and analyze problems critically through research based or project based approach of learning.
- c) Postgraduates will excerpt information from various sources and apply mathematical, analytical, statistical and IT tools for financial and accounting analysis.
- d) Postgraduates will develop an ability to effectively communicate both orally and in written forms.
- e) Postgraduates will appreciate the importance of working independently and in a team in order to achieve common goals.
- f) Postgraduates will acquire critical and analytical thinking and will be able to apply the same in effective decision making.
- g) Postgraduates will acquire professional and intellectual integrity, professional code of conduct, ethics and values to contribute for sustainable development of society by becoming socially responsible citizen.

PROGRAMME SPECIFIC OUTCOMES (PSO)

- h) Postgraduates will apply the lifelong learning and exhibit high level of commitment to identify a timely opportunity and use business innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.
- i) Postgraduates will acquire managerial positions or take up entrepreneurial ventures by applying the skills and knowledge gained.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- I. Postgraduates will gain advanced knowledge in the domain of commerce, management and finance
- II. Postgraduates will be able to apply the accounting, finance and management tools and techniques to implement systematic decision making process.
- III. Postgraduates will attain research insights, professional skills and competencies to enhance lifelong learning and excel in diverse career path.
- IV. Postgraduates will adapt to a rapidly changing global environment and become socially responsible and value driven citizens committed to sustainable growth.

| Program Educational Objectives | Program Outcomes | | | | | | | | |
|--|------------------|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i |
| Postgraduates will gain advanced knowledge in the domain of commerce, management and finance | ✓ | | | | ✓ | | | | |
| Postgraduates will be able to apply the accounting, finance and management tools and techniques to implement systematic decision making process. | ✓ | | | | ✓ | | | | |
| Postgraduates will attain research insights, professional skills and competencies to enhance lifelong learning and excel in diverse career path. | | | ✓ | ✓ | | ✓ | | | |
| Postgraduates will adapt to a rapidly changing global environment and become socially responsible and value driven citizens committed to sustainable growth. | | ✓ | | | | | ✓ | ✓ | ✓ |

BACHELOR OF COMPUTER APPLICATIONS (BCA)

CHOICE BASED CREDIT SYSTEM (CBCS)

**Curriculum
(2019 – 2022)**



**DEPARTMENT OF COMPUTER APPLICATIONS
FACULTY OF ARTS, SCIENCE AND HUMANITIES**

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act, 1956)

Eachanari (Post), Coimbatore – 641 021.

Phone No. 0422-6471114, 6471115, 6453777

Fax No: 0422-2980022-3

E mail ID: info@karpagam.com

Web: www.kahedu.edu.in

PROGRAM OUTCOMES :The program must enable students to attain by the time of graduation

- a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
- b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- c) An ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
- d) An ability to function effectively on teams to accomplish a common goal
- e) An understanding of professional, ethical, legal, security and social issues and responsibilities
- f) An ability to communicate effectively with a range of audiences
- g) An ability to use current techniques, skills and improves the employability of students.
- h) An ability to use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking and web systems and technologies
- i) An ability to effectively integrate IT-based solutions into the user environment
- j) An understanding of best practices and standards and their application

PROGRAM SPECIFIC OUTCOME (PSOs)

- k) Understand analyze and develop computer programs in the areas related to Database systems and Big data Analytics, cloud computing, soft computing, IoT, Image processing, Green computing, web designing, mobile computing and networking for efficient design of computer based system of varying complexity.
- l) Apply standard software Engineering practices and strategies in software project development using open-source programming environment and enhance entrepreneurship skills to deliver a quality for business success.
- m) Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.
- n) An ability to produce cost effective, quality and maintainable software products and solutions (services) meeting the global standards and requirements with the knowledge acquired and using the emerging techniques, tools and software engineering methodologies and principles and able to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- PEO I : To be a working Information Technology (IT) professional with core competencies that can be used on multi-disciplinary projects
- PEO II : To understand the importance of relationship building within the IT industry
- PEO III : To understand the need for lifelong learning in the exploration and journey in IT
- PEO IV : To understand, evaluate and practice ethical behavior within the IT industry
- PEO V : To be cognizant of security issues and their impacts on industry

MAPPING of PEOs and POs

| POs | a | b | c | d | e | f | f | h | i | j | k | l | m | n |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO I | X | X | X | | | | X | X | X | | | | X | |
| PEO II | | | | X | X | X | | | | | | | | X |
| PEO III | X | X | | | | | | X | | X | X | | | |
| PEO IV | | | X | X | X | | | | X | | | X | | |
| PEO V | | | | | X | | | | | X | | X | | |

DEPARTMENT OF COMPUTER APPLICATIONS
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – Bachelor of Computer Applications (BCA)
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Cred it(s) | Maximum Marks | | |
|----------------------|--|--------------------------|--------------|--------------------------|---|----|------------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER - I | | | | | | | | | | |
| 19LSU101 | Language -I | V | d,e,f | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU101 | Programming Fundamentals using C / C++ | I | a,b,c, h | 05 | - | - | 5 | 40 | 60 | 100 |
| 19CAU102 | Computer System Architecture | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU103 | Introduction to Information Technology | III | a,b,c, h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU111 | Programming Fundamentals using C / C++ (Practical) | I | a,b,c, g,i,j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU112 | Computer System Architecture (Practical) | I | b,c,g, i,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19CAU113 | Introduction to Information Technology (Practical) | III | a,b,c, h,i,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19AEC101 | Environmental Studies | IV | d,e | 03 | - | - | 3 | 40 | 60 | 100 |
| Semester Total | | | | 20 | - | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – II | | | | | | | | | | |
| 19LSU201 | Language – II | V | d,e,f | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ENU201 | English | II | d,e,f | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU201 | Programming in JAVA | I | a,b,c, d | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU202 | Discrete Structures | I,II I | a,b | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU203 | Computer Networks and Internet Technologies | IV ,V | g,k | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU211 | Programming in JAVA - Practical | I | a,c,h,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU212 | Discrete Structures - Practical | I,II I | a,b,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19CAU213 | Computer Networks and Internet | IV | g,k,i,j | - | - | 03 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--------------------------|---|---------|-----------------|-----------|----------|-----------|-----------|------------|------------|------------|
| | Technologies-Practical | | | | | | | | | |
| Semester Total | | | | 20 | - | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – III | | | | | | | | | | |
| 19CAU301 | Data Structures | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU302 | Operating Systems | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU303 | Advanced Networking | I, V | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU304A / 19CAU304B | Android Programming / Struts Framework | I | g,k,i | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CAU311 | Data Structures - Practical | I | a,b,c,i j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU312 | Operating Systems - Practical | I | a,b,c,i j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU313 | Advanced Networking - Practical | I, V | a,b,c,i j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU314A / 19CAU314B | Android Programming - Practical / Struts Framework- Practical | I | g,i,j,k | - | - | 03 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19CAU401 | Relational Database Management Systems | I | f,g,k | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU402 | Software Engineering | I,II | a,b,l, n | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU403 | Web Programming | I | g,k | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU404A / 19CAU404B | R Programming / Open Source Technologies | I | a,b,g, i | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CAU411 | Relational Database Management Systems- Practical | I | b,c,d, g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU412 | Software Engineering - Practical | I,II | b,c,h, i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU413 | Web Programming - Practical | I,II | a,b,g, i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU414A / 19CAU414B | R Programming - Practical / Open Source Technologies - Practical | I,II | a,b,g, i | - | - | 03 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – V | | | | | | | | | | |
| 19CAU501A / 19CAU501B | Artificial Intelligence/ Software Testing | I | a,b,e, g,i,m | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU502A / 19CAU502B | Computer Graphics/ Information Security and Cyber Laws | I, V | a,b,h, g,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU503A / | Data Mining / | I,II | a,c,h,i | 04 | - | - | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|---|------|-----------------|------------|----------|-----------|------------|-------------|-------------|-------------|
| 19CAU503B | Programming in Python | | e,g,l,m | | | | | | | |
| 19CAU504A / 19CAU504B | Digital Image Processing / Mongo DB | I | a,b,h | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CAU511A / 19CAU511B | Artificial Intelligence- Practical/ Software Testing - Practical | I | a,b,e,g,i,m | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU512A / 19CAU512B | Computer Graphics- Practical / Information Security and Cyber Laws- Practical | I, V | a,b,h,g,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU513A / 19CAU513B | Data Mining - Practical/ Programming in Python - Practical | I,II | a,c,h,i,e,g,l,m | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU514A / 19CAU514B | Digital Image Processing - Practical / Mongo DB - Practical | I | a,b,h | - | - | 03 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – VI | | | | | | | | | | |
| 19CAU601A / 19CAU601B | PHP Programming / Unix / Linux Programming | I | a,b,g,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU602A / 19CAU602B | Database Administration / Cloud Computing | I,II | g,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CAU603A / 19CAU603B | Big Data Analytics / System Programming | I | a,b,g,i | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CAU611A / 19CAU611B | PHP Programming - Practical/ Unix / Linux Programming - Practical | I | C,h,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU612A / 19CAU612B | Database Administration - Practical/ Cloud Computing- Practical | I | g,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CAU613A / 19CAU613B | Big Data Analytics - Practical/ System Programming - Practical | I | a,b,g,i | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CAU691 | Project and Viva Voce | III | a,b,i,j | 08 | - | - | 6 | 40 | 60 | 100 |
| | ECA / NCC / NSS / Sports / General interest etc | Good | | | | | | | | |
| Semester Total | | | | 19 | - | 11 | 22 | 280 | 420 | 700 |
| Program Total | | | | 104 | - | 76 | 140 | 1880 | 2820 | 4700 |

**** The color indicates:**

***Entrepreneur oriented courses – Green**

***Employability oriented courses – Blue**

***Skill development oriented courses - Red**

| Ability Enhancement Courses (AEC) | | |
|-----------------------------------|-------------|-----------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language –I |
| | 19AEC101 | Environmental Studies |
| II | 19LSU201 | Language –II |
| | 19ENU201 | English |

| Generic Elective Courses (GE) / Allied Courses | | |
|--|-------------|--|
| Semester | Course Code | Name of the Course |
| I | 19CAU102 | Computer System Architecture |
| | 19CAU112 | Computer System Architecture - Practical |
| II | 19CAU202 | Discrete Structures |
| | 19CAU212 | Discrete Structures - Practical |

| Core Courses (CC) | | |
|-------------------|-------------|---|
| Semester | Course Code | Name of the Course |
| I | 19CAU101 | Programming Fundamentals using C / C++ |
| | 19CAU103 | Computer Fundamentals |
| | 19CAU111 | Programming Fundamentals using C / C++ -Practical |
| | 19CAU113 | Computer Fundamentals - Practical |
| II | 19CAU201 | Programming in JAVA |
| | 19CAU203 | Computer Networks and Internet Technologies |
| | 19CAU211 | Programming in JAVA - Practical |
| | 19CAU213 | Computer Networks and Internet Technologies-Practical |
| III | 19CAU301 | Data Structures |
| | 19CAU302 | Operating Systems |
| | 19CAU303 | Advanced Networking |
| | 19CAU311 | Data Structures-Practical |
| | 19CAU312 | Operating Systems-Practical |
| | 19CAU313 | Advanced Networking-Practical |
| IV | 19CAU401 | Relational Database Management Systems |
| | 19CAU402 | Software Engineering |
| | 19CAU403 | Web Programming |
| | 19CAU411 | Relational Database Management Systems-Practical |
| | 19CAU412 | Software Engineering-Practical |
| | 19CAU413 | Web Programming-Practical |
| V | 19CAU501A | Artificial Intelligence |
| | 19CAU501B | Software Testing |
| | 19CAU511A | Artificial Intelligence-Practical |
| | 19CAU511B | Software Testing-Practical |
| VI | 19CAU601A | PHP Programming |
| | 19CAU601B | Unix / Linux Programming |
| | 19CAU611A | PHP Programming -Practical |
| | 19CAU611B | Unix / Linux Programming -Practical |
| | 19CAU691 | Project and Viva Voce |

| Skill Enhancement Courses(SEC) | | |
|--------------------------------|-------------|-------------------------------|
| Semester | Course Code | Name of the Course |
| III | 19CAU304A | Android Programming |
| | 19CAU304B | Struts Framework |
| | 19CAU314A | Android Programming-Practical |
| | 19CAU314B | Struts Framework-Practical |

| | | |
|-----------|-----------|--|
| IV | 19CAU404A | R Programming |
| | 19CAU404B | Open Source Technologies |
| | 19CAU414A | R Programming-Practical |
| | 19CAU414B | Open Source Technologies-Practical |
| V | 19CAU502A | Computer Graphics |
| | 19CAU502B | Information Security and Cyber Laws |
| | 19CAU512A | Computer Graphics-Practical |
| | 19CAU512B | Information Security and Cyber Laws -Practical |
| VI | 19CAU603A | Big Data Analytics |
| | 19CAU603B | System Programming |
| | 19CAU613A | Big Data Analytics -Practical |
| | 19CAU613B | System Programming-Practical |

| Discipline Specific Elective Courses (DSE) | | |
|---|--------------------|------------------------------------|
| Semester | Course Code | Name of the Course |
| V | 19CAU503A | Data Mining |
| | 19CAU503B | Programming in Python |
| | 19CAU513A | Data Mining-Practical |
| | 19CAU513B | Programming in Python -Practical |
| | 19CAU504A | Digital Image Processing |
| | 19CAU504B | Mongo DB |
| | 19CAU514A | Digital Image Processing-Practical |
| | 19CAU514B | Mongo DB -Practical |
| VI | 19CAU602A | Database Administration |
| | 19CAU602B | Cloud Computing |
| | 19CAU612A | Database Administration -Practical |
| | 19CAU612B | Cloud Computing-Practical |

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MASTER OF COMPUTER APPLICATIONS (MCA) CHOICE BASED CREDIT SYSTEM (CBCS)

**Curriculum
(2019 – 2022)**



**DEPARTMENT OF COMPUTER APPLICATIONS
FACULTY OF ARTS, SCIENCE AND HUMANITIES**

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act, 1956)

Eachanari(Post), Coimbatore – 641 021.

Phone No. 0422-6471114, 6471115, 6453777

Fax No: 0422-2980022-3

E mail ID: info@karpagam.com

Web: www.kahedu.edu.in

PROGRAM OUTCOMES: On successful completion of the program the student attains

- a. Engineering Knowledge: Apply the knowledge of mathematics and computing fundamentals to various real time applications for any given requirement
- b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- c. Design/ Development of Solutions: Design solutions for complex problems and design system components or processes that meets the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- d. Conduct Investigations of Difficult Problems: Use research-based information and methods including design of applications, analysis and interpretation of data, and synthesis of the information to provide valid results.
- e. Recent Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to advanced software engineering activities with an understanding of the limitations.
- f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- g. Environment and Sustainability: Understand the impact of the software engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse groups, and in multidisciplinary scenarios.
- j. Communication: Communicate effectively on different engineering activities with the IT community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

k. Project Management and Finance: Demonstrate knowledge and understanding of the computer engineering and management principles and apply these techniques as a member and as leader in a team, to manage projects and in multidisciplinary environments.

l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OBJECTIVES (PSOs):

m. Enable the students to select the suitable data model, appropriate architecture and platform to implement a system with high performance.

n. Enable the students to design and integrate various system based modules to provide user interactive solutions for various challenges.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I: To enable the students to excel in the computing profession by providing high technical foundations in the field of computer applications.

PEO II: To provide students with various computing skills like analysis, design and development of innovative software products to meet the industry needs.

PEO III: To motivate students to pursue lifelong learning and to do research as computing experts and scientists.

PEO IV: To encourage students to communicate and function effectively in teams in multidisciplinary fields within the global, social and environmental context.

MAPPING of PEOs and POs

| POs | a | b | c | d | e | f | g | h | i | j | k | l |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| PEO1 | X | X | X | X | X | | | | | | | |
| PEO2 | | X | X | X | | X | | X | | X | X | X |
| PEO3 | | | X | | X | X | X | | X | | X | X |
| PEO4 | X | X | | | X | X | | X | | X | X | X |

DEPARTMENT OF COMPUTER SCIENCE, APPLICATIONS & INFORMATION TECHNOLOGY
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS) - MCA
(2019 – 2020 Batch and onwards)

| Course Code | Name of the Course | Objectives and out comes | | Instruction Hours / Week | | | Credit(s) | Maximum Marks | | |
|----------------------|--|--------------------------|--------------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER - I | | | | | | | | | | |
| 19CAP101 | Information Technology | I,III | c,d,e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP102 | C Programming and Data Structures | I,IV | a,b,c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP103 | Computer Organization and Architecture | I ,II, IV | a,c,e, f | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP104 | Mathematical Foundations | II | a,b,k | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP105 | Introduction to Management Functions | I,II, III | h,i,j,k | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP111 | Information Technology- Practical | I,II, V | c,d,e | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CAP112 | Programming in C - Practical | I,III | a,b,c | - | - | 5 | 2 | 40 | 60 | 100 |
| 19CAP113 | Tally - Practical | I - IV | a,b,c. d | - | - | 4 | 2 | 40 | 60 | 100 |
| | Journal Paper Analysis & Presentation | | | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 13 | 26 | 320 | 480 | 800 |
| SEMESTER - II | | | | | | | | | | |
| 19CAP201 | Object Oriented Programming with C++ | I-III | b,c,d, e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP202 | Operating System | I-III | a,b,c, f | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP203 | Information Systems : Analysis , Design and Implementation | I-III | a,b,c d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP204 | Accounting and Management Control | I,IV | a,b,d, e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP205 | Probability and Combinations | I,II | a,b | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP211 | Object Oriented Programming with C++ - Practical | I,II, III | b,c,d, e,i,k | - | - | 5 | 2 | 40 | 60 | 100 |
| 19CAP212 | Operating System - Practical | I-IV | a,b,c | - | - | 4 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|---|------------|-------------------------|-----------|----------|-----------|-----------|------------|------------|------------|
| 19CAP213 | CASE Tools - Practical | I,IV | a,b,c, d,e | - | - | 4 | 2 | 40 | 60 | 100 |
| | Journal Paper Analysis & Presentation | | | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 13 | 26 | 320 | 480 | 800 |
| SEMESTER - III | | | | | | | | | | |
| 19CAP301 | Database Management Systems | I-III | a,b,c d,e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP302 | Computer Networks | I-III | a,b,c, e,f,l | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP303 | Advanced Java and Springs | I-III | b,c,e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP304 | Statistical Computing | II,II I | a,b,c, d,e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP305 | Management Support Systems | I-IV | h,i,j,k ,l | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP311 | Database Management Systems- Practical | I-III | a,b,c d,e | - | - | 5 | 2 | 40 | 60 | 100 |
| 19CAP312 | Computer Network - Practical | I-III | a,b,c, e,f,j,l | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CAP313 | Advanced Java and Springs- Practical | I-III | b,c,e | - | - | 4 | 2 | 40 | 60 | 100 |
| | Journal Paper Analysis & Presentation | | | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 13 | 26 | 320 | 480 | 800 |
| SEMESTER - IV | | | | | | | | | | |
| 19CAP401 | J2EE | I-III | a,b,c, d,e,i | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP402 | Mobile Computing | I-III | a,b,c, d,e,f, g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP403 | Organizational Behaviour | I-IV | a,f,g, h,i,j,k ,l | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP404D | Database Administration | I-III | a,b,c, e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP404N | Cryptography and Network Security | I-III | a,b,c, f,g | | | | | | | |
| 19CAP404S | Software Testing | I-III | a,b,c, d,e | | | | | | | |
| 19CAP404W | XML | I-III | a,b,c, d,e | | | | | | | |
| 19CAP404B | Managerial Economics | I-IV | f,g,h, i,j,k,l | | | | | | | |

| | | | | | | | | | | |
|-----------------------|--|-------|-------------------|-----------|---|-----------|-----------|------------|------------|------------|
| 19CAP405D | Distributed Database Management System | I-III | a,b,c, e,g,k | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP405N | TCP/IP | I-III | a,b,d c.d.e. f,j | | | | | | | |
| 19CAP405S | Object Oriented Analysis and Design with UML | I-III | a,b,c, d,e | | | | | | | |
| 19CAP405W | Web Services | I-III | a,b,c, e,j | | | | | | | |
| 19CAP405B | Corporate Planning | I-IV | f,g,h, i,j,k,l | | | | | | | |
| 19CAP411 | J2EE - Practical | I-III | a,b,c, d,e,i, k,l | - | - | 5 | 2 | 40 | 60 | 100 |
| 19CAP412 | Mobile Computing - Practical | I-III | a,b,c, d,e,f, g,h | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CAP413D | DBA – Practical | I-III | a,b,c, e | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CAP413N | Network security - Practical | I-III | a,b,c, f,g,h | | | | | | | |
| 19CAP413S | Software Testing – Practical | I-IV | a,b,c, d,e | | | | | | | |
| 19CAP413W | XML – Practical | I-III | a,b,c, d,e | | | | | | | |
| 19CAP413B | WAP - Practical | I-III | a,b,c, d,e | | | | | | | |
| | Journal Paper Analysis & Presentation | - | - | 2 | - | - | - | - | - | - |
| Semester Total | | - | - | 22 | - | 13 | 26 | 320 | 480 | 800 |
| SEMESTER - V | | | | | | | | | | |
| 19CAP501 | PHP5/ MySQL | I-III | a,b,c, e,f | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP502 | .Net Programming | I-III | a,c,d, e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP503 | Optimization Techniques | II | a,b,d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP504N | Network Architecture and Management | I-IV | b,c,e, l | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP504S | Software Project Management | I-IV | a,c,d, e,i,k | | | | | | | |
| 19CAP504W | Angular JS | II | a,b | | | | | | | |
| 19CAP504B | MIS Framework | I-III | a,c,d | | | | | | | |

| | | | | | | | | | | |
|-----------------------|---|-------|-----------------|------------|---|-----------|------------|-------------|-------------|-------------|
| 19CAP504D | Data Mining and Data Warehousing | I-III | a,c,d,f,k | | | | | | | |
| 19CAP505N | Distributed Computing | I-III | a,c,d,e,f | | | | | | | |
| 19CAP505S | Software Metrics | I-III | a,b,c,d,e,f,g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CAP505W | Semantic Web | II | a,b | | | | | | | |
| 19CAP505B | Taxation Practices | I-III | a,c,d | | | | | | | |
| 19CAP505D | Big Data Analytics | I-III | a,b,c,e | | | | | | | |
| 19CAP511 | PHP5/ MySQL (Practical) | I-III | a,b,c,e | - | - | 5 | 2 | 40 | 60 | 100 |
| 19CAP512 | .Net Programming (Practical) | I-III | a,b,c,d,e | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CAP513N | Network Simulator (Practical) | I-III | a,b,c,d,e | | | | | | | |
| 19CAP513S | Software Development (Practical) Using Moodle | I-IV | a,c,d,e,i,k | | | | | | | |
| 19CAP513W | Angular JS (Practical) | I-III | a,b,c,d,e | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CAP513B | MIS (Practical) | I-IV | a,b,c,d,h,i,j,k | | | | | | | |
| 19CAP513D | Data Mining (Practical) | I-III | a,c,e,f | | | | | | | |
| | Journal Paper Analysis & Presentation | - | - | 2 | - | - | - | - | - | - |
| Semester Total | | - | - | 22 | - | 13 | 26 | 320 | 480 | 800 |
| SEMESTER – VI | | | | | | | | | | |
| 19CAP691 | Project and Viva Voce | I-III | a-l | - | - | - | 15 | 80 | 120 | 200 |
| Semester Total | | | | - | - | - | 15 | 80 | 120 | 200 |
| Program Total | | | | 110 | - | 65 | 145 | 1680 | 2520 | 4200 |

Elective Courses*

| Elective – 1 (19CAP404) | | Elective – 2 (19CAP405) | |
|--------------------------------|--|--------------------------------|--|
| Course Code | Name of the Course (Theory & Practical) | Course Code | Name of the Course (Theory) |
| 19CAP404D | Database Administration | 19CAP405D | Distributed Database Management System |
| 19CAP404N | Cryptography And Network Security | 19CAP405N | TCP/IP |
| 19CAP404S | Software Testing | 19CAP405S | Object Oriented Analysis and Design with UML |
| 19CAP404W | XML | 19CAP405W | Web Services |
| 19CAP404B | Managerial Economics | 19CAP405B | Corporate Planning |
| 19CAP413D | DBA - Practical | | |
| 19CAP413N | Network security- Practical | | |
| 19CAP413S | Software Testing- Practical | | |
| 19CAP413W | XML - Practical | | |
| 19CAP413B | WAP - Practical | | |

Elective Courses*

| Elective – 1 (19CAP504) | | Elective – 2 (19CAP505) | |
|--------------------------------|--|--------------------------------|------------------------------------|
| Course Code | Name of the Course (Theory & Practical) | Course Code | Name of the Course (Theory) |
| 19CAP504N | Network Architecture and Management | 19CAP505N | Distributed Computing |
| 19CAP504S | Software Project Management | 19CAP505S | Software Metrics |
| 19CAP504W | Angular JS | 19CAP505W | Semantic Web |
| 19CAP504B | MIS Framework | 19CAP505B | Taxation Practices |
| 19CAP504D | Data Mining and Data Warehousing | 19CAP505D | Big Data Analytics |
| 19CAP513N | Network Simulator (Practical) | | |
| 19CAP513S | Software Development (Practical) Using Moodle | | |
| 19CAP513W | Angular JS (Practical) | | |
| 19CAP513B | MIS (Practical) | | |
| 19CAP513D | Data Mining (Practical) | | |

Specialization:

| |
|---------------------------------|
| D - Database |
| N - Network |
| S - Software Engineering |
| W - Web Designing |
| B - Business Management |

**** The color indicates:**

*** Entrepreneurship oriented course-Green**

*** Employability Oriented Course-Blue**

*** Skill Development oriented course-Red**

DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.Sc. Computer Science
(2019–2020 Batch and onwards)

CURRICULUM

PROGRAM OUTCOMES: The program must enable students to attain by the time of graduation

- a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
- b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- c) An ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
- d) An ability to function effectively on teams to accomplish a common goal
- e) An understanding of professional, ethical, legal, security and social issues and responsibilities
- f) An ability to communicate effectively with a range of audiences
- g) An ability to use current techniques, skills and tools necessary for computing practice
- h) An ability to use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking and web systems and technologies
- i) An ability to effectively integrate IT-based solutions into the user environment
- j) An understanding of best practices and standards and their application

PROGRAM SPECIFIC OUTCOME (PSOs)

- k) Understand analyze and develop computer programs in the areas related to Database systems and Big data Analytics, cloud computing, soft computing, IoT, Image

processing, Green computing, web designing, mobile computing and networking for efficient design of computer based system of varying complexity.

- l) Apply standard software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality for business success.
- m) Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.
- n) An ability to produce cost effective, quality and maintainable software products and solutions (services) meeting the global standards and requirements with the knowledge acquired and using the emerging techniques, tools and software engineering methodologies and principles and able to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- PEO I : To be a working Information Technology (IT) professional with core competencies that can be used on multi-disciplinary projects
- PEO II : To understand the importance of relationship building within the IT industry
- PEO III : To understand the need for lifelong learning in the exploration and journey in IT
- PEO IV : To understand, evaluate and practice ethical behavior within the IT industry
- PEO V : To be cognizant of security issues and their impacts on industry

MAPPING of PEOs and POs

| POs | a | b | C | d | e | f | f | h | i | j | k | l | m | n |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO I | X | X | X | | | | X | X | X | | | | X | |
| PEO II | | | | X | X | X | | | | | | | | X |
| PEO III | X | X | | | | | | X | | X | X | | | |
| PEO IV | | | X | X | X | | | | X | | | X | | |
| PEO V | | | | | X | | | | | X | | X | | |

DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.Sc. Computer Science
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|--------------------------|---------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER - I | | | | | | | | | | |
| 19LSU101 | Language-I | IV | d,e | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU101 | Programming Fundamentals using C / C++ | I | a,b,c | 05 | - | - | 5 | 40 | 60 | 100 |
| 19CSU102 | Computer System Architecture | I | b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU103 | Computer Fundamentals | III | h,j | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU111 | Programming Fundamentals using C / C++ - Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU112 | Computer System Architecture – Practical | I | a,c,g | - | - | 03 | 2 | 40 | 60 | 100 |
| 19CSU113 | Computer Fundamentals – Practical | III | b,h,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19AEC101 | Environmental Studies | IV | d,e | 03 | - | - | 3 | 40 | 60 | 100 |
| Semester Total | | | | 20 | - | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – II | | | | | | | | | | |
| 19LSU201 | Language – II | IV | d,e | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ENU201 | English – I | II | d,f | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU201 | Programming in JAVA | I | c,h,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU202 | Discrete Structures | III | a,b | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU203 | Computer Networks and Internet Technologies | IV | e,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU211 | Programming in JAVA – Practical | I | a,c,h,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU212 | Discrete Structures – Practical | III | a,b,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19CSU213 | Computer Networks and Internet Technologies - Practical | IV | c,e | - | - | 03 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 20 | - | 10 | 26 | 320 | 480 | 800 |
| SEMESTER - III | | | | | | | | | | |
| 19CSU301 | Data Structures | I | a,b,g,h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU302 | Operating Systems | III | a,b,h,k | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU303 | Computer Networks | III | a,b,j,k | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU304A | Android Programming | I | a,b,c,m | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CSU304B | Programming in Visual Basic / Gambas | IV | c,d,e,i | | | | | 40 | 60 | 100 |
| 19CSU311 | Data Structures – Practical | I | a,b,g, | - | - | 04 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|--|-----|-----------|-----------|----------|-----------|-----------|------------|------------|------------|
| | | | h | | | | | | | |
| 19CSU312 | Operating Systems – Practical | III | a,b,h,k | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU313 | Computer Networks – Practical | III | a,b,j,k | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU314A | Android Programming – Practical | I | a,b,c,m | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CSU314B | Programming in Visual Basic / Gambas - Practical | IV | c,d,e,i | - | - | 03 | | 40 | 60 | 100 |
| Semester Total | | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19CSU401 | Design and Analysis of Algorithms | I | a,b,c,m | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU402 | Software Engineering | IV | c,d,e,l | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU403 | Database Management Systems | I | a,b,g,h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU404A | HTML Programming | III | a,b,h,j,k | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CSU404B | XML Programming | III | a,b,h,j,k | | | | | | | |
| 19CSU411 | Design and Analysis of Algorithms - Practical | I | a,b,c,m | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU412 | Software Engineering – Practical | IV | c,d,e,l | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU413 | Database Management Systems – Practical | I | a,b,g,h | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU414A | HTML Programming – Practical | III | a,b,h,j,k | | | 03 | 1 | 40 | 60 | 100 |
| 19CSU414B | XML Programming – Practical | III | a,b,h,j,k | | | | | | | |
| Semester Total | | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER –V | | | | | | | | | | |
| 19CSU501A | Cloud Computing | I | b,e,m | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU501B | Software Testing | I | c,g | | - | - | | | | |
| 19CSU502A | Internet Technologies | III | a,b,h,j | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU502B | Information Security and Cyber Law | I | a,b,h | | | | | | | |
| 19CSU503A | Data Mining | III | A,b,h,k | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU503B | R Programming | II | d,e,f | | - | - | | | | |
| 19CSU504A | Oracle (SQL/PL-SQL) | IV | c,e,i,l | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CSU504B | Programming in Python | III | b,h,j,k | | | | | | | |
| 19CSU511A | Cloud Computing – Practical | I | b,e,m | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU511B | Software Testing - Practical | I | c,g | - | - | | | | | |
| 19CSU512A | Internet Technologies - Practical | III | a,b,h,j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU512B | Information Security and Cyber Law - Practical | I | a,b,h | | | | | | | |
| 19CSU513A | Data Mining – Practical | III | a,b,h,k | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU513B | R Programming – Practical | II | d,e,f | - | - | | | | | |

| | | | | | | | | | | |
|---------------------|---|------|-----------|------------|----------|-----------|------------|-------------|-------------|-------------|
| 19CSU514A | Oracle (SQL/PL-SQL) – Practical | IV | c,e,i,l | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CSU514B | Programming in Python – Practical | III | b,h,j,k | - | - | 03 | 1 | 40 | 60 | 100 |
| | Semester Total | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER –VI | | | | | | | | | | |
| 19CSU601A | PHP Programming | V | e,j,l | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU601B | Unix / Linux Programming | I | a,b,h,i | | | | | | | |
| 19CSU602A | Web and E-Commerce Technologies | I | a,d,g,m | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CSU602B | Computer Graphics | I | a,c,g,m | | | | | | | |
| 19CSU603A | Artificial Intelligence | III | a,b,h,j,k | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CSU603B | System Programming | IV | c,d,e | | | | | | | |
| 19CSU611A | PHP Programming –Practical | V | e,j,l | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU611B | Unix / Linux Programming – Practical | I | a,b,h,i | | | | | | | |
| 19CSU612A | Web and E-Commerce Technologies - Practical | I | a,d,g,m | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CSU612B | Computer Graphics – Practical | I | a,c,g,m | - | - | | | | | |
| 19CSU613A | Artificial Intelligence – Practical | III | a,b,h,j,k | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CSU613B | System Programming – Practical | IV | c,d,e | | | | | | | |
| 19CSU691 | Project | II | d,e,f,n | 08 | - | - | 6 | 40 | 60 | 100 |
| | ECA / NCC / NSS / Sports / General interest etc | Good | | | | | | | | |
| | Semester Total | | | 19 | - | 11 | 22 | 280 | 420 | 700 |
| | Grand Total | | | 104 | - | 76 | 140 | 1880 | 2820 | 4700 |

Entrepreneur Oriented Courses -Green
 Employability Oriented Courses -Blue
 Skill Development Oriented Courses -Red

| Ability Enhancement Courses (AEC) | | |
|--|-------------|-----------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language –I |
| | 19AEC101 | Environmental Studies |
| II | 19LSU201 | Language –II |
| | 19ENU201 | English |

| Generic Elective Courses (GE) /Allied Courses | | |
|--|-------------|--|
| Semester | Course Code | Name of the Course |
| I | 19CSU102 | Computer System Architecture |
| | 19CSU112 | Computer System Architecture - Practical |
| II | 19CSU202 | Discrete Structures |
| | 19CSU212 | Discrete Structures - Practical |

| Core Courses (CC) | | |
|--------------------------|-------------|---|
| Semester | Course Code | Name of the Course |
| I | 19CSU101 | Programming Fundamentals using C / C++ |
| | 19CSU103 | Computer Fundamentals |
| | 19CSU111 | Programming Fundamentals using C / C++ -Practical |
| | 19CSU113 | Computer Fundamentals - Practical |
| II | 19CSU201 | Programming in JAVA |
| | 19CSU203 | Computer Networks and Internet Technologies |
| | 19CSU211 | Programming in JAVA - Practical |
| | 19CSU213 | Computer Networks and Internet Technologies - Practical |
| III | 19CSU301 | Data Structures |
| | 19CSU302 | Operating Systems |
| | 19CSU303 | Computer Networks |
| | 19CSU311 | Data Structures – Practical |
| | 19CSU312 | Operating Systems – Practical |
| | 19CSU313 | Computer Networks– Practical |
| IV | 19CSU401 | Design and Analysis of Algorithms |
| | 19CSU402 | Software Engineering |
| | 19CSU403 | Database Management Systems |
| | 19CSU411 | Design and Analysis of Algorithms - Practical |
| | 19CSU412 | Software Engineering – Practical |
| | 19CSU413 | Database Management Systems – Practical |
| V | 19CSU502A | Internet Technologies |
| | 19CSU502B | Information Security and Cyber Laws |
| | 19CSU512A | Internet Technologies– Practical |
| | 19CSU512B | Information Security and Cyber Laws – Practical |
| VI | 19CSU603A | Artificial Intelligence |
| | 19CSU603B | System Programming |
| | 19CSU613A | Artificial Intelligence – Practical |
| | 19CSU613B | System Programming – Practical |
| | 19CSU691 | Project |

| Skill Enhancement Courses(SEC) | | |
|---------------------------------------|-------------|---|
| Semester | Course Code | Name of the Course |
| III | 19CSU304A | Android Programming |
| | 19CSU304B | Programming in Visual Basic/Gambas |
| | 19CSU314A | Android Programming – Practical |
| | 19CSU314B | Programming in Visual Basic/Gambas– Practical |
| IV | 19CSU404A | HTML Programming |
| | 19CSU404B | XML Programming |
| | 19CSU414A | HTML Programming – Practical |
| | 19CSU414B | XML Programming – Practical |
| V | 19CSU501A | Cloud Computing |
| | 19CSU501B | Software Testing |
| | 19CSU511A | Cloud Computing - Practical |
| | 19CSU511B | Software Testing – Practical |
| VI | 19CSU601A | PHP Programming |
| | 19CSU601B | Unix / Linux Programming |
| | 19CSU611A | PHP Programming –Practical |
| | 19CSU611B | Unix / Linux Programming – Practical |

| Discipline Specific Elective Courses (DSE) | | |
|---|-------------|---|
| Semester | Course Code | Name of the Course |
| V | 19CSU503A | Data Mining |
| | 19CSU503B | R Programming |
| | 19CSU504A | Oracle (SQL/PL-SQL) |
| | 19CSU504B | Programming in Python |
| V | 19CSU513A | Data Mining – Practical |
| | 19CSU513B | R Programming –Practical |
| | 19CSU514A | Oracle (SQL/PL-SQL) – Practical |
| | 19CSU514B | Programming in Python – Practical |
| VI | 19CSU602A | Web and E-Commerce Technologies |
| | 19CSU602B | Computer Graphics |
| | 19CSU612A | Web and E-Commerce Technologies – Practical |
| | 19CSU612B | Computer Graphics – Practical |

DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.Sc. Computer Science(Cognitive Systems)
(2019–2020 Batch and onwards)
CURRICULUM

PROGRAM OUTCOMES:

The program must enable students to attain by the time of graduation

- a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
- b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- c) An ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
- d) An ability to function effectively on teams to accomplish a common goal
- e) An understanding of professional, ethical, legal, security and social issues and responsibilities
- f) An ability to communicate effectively with a range of audiences
- g) An ability to use current techniques, skills and tools necessary for computing practice
- h) An ability to use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking and web systems and technologies
- i) An ability to effectively integrate IT-based solutions into the user environment
- j) An understanding of best practices and standards and their application

PROGRAM SPECIFIC OUTCOME (PSOs)

- k) Understand analyze and develop computer programs in the areas related to Database systems and Big data Analytics, cloud computing, soft computing, IoT, Image processing, Green computing, web designing, mobile computing and networking for efficient design of computer based system of varying complexity.
- l) Apply standard software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality for business success.
- m) Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.

- n) An ability to produce cost effective, quality and maintainable software products and solutions (services) meeting the global standards and requirements with the knowledge acquired and using the emerging techniques, tools and software engineering methodologies and principles and able to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- PEO I : To be a working Information Technology (IT) professional with core competencies that can be used on multi-disciplinary projects
- PEO II : To understand the importance of relationship building within the IT industry
- PEO III : To understand the need for lifelong learning in the exploration and journey in IT
- PEO IV : To understand, evaluate and practice ethical behavior within the IT industry
- PEO V : To be cognizant of security issues and their impacts on industry

MAPPING of PEOs and POs

| POs | a | B | C | d | e | f | F | h | i | j | k | l | m | n |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO I | X | X | X | | | | X | X | X | | | | X | |
| PEO II | | | | X | X | X | | | | | | | | X |
| PEO III | X | X | | | | | | X | | X | X | | | |
| PEO IV | | | X | X | X | | | | X | | | X | | |
| PEO V | | | | | X | | | | | X | | X | | |

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
(Established Under Section 3 of UGC Act, 1956)
Coimbatore-21
Faculty of Arts, Science and Humanities
Department of Computer Science
UG Curriculum (CBCS)- (2019 – 2022) Batch

Program: B.Sc Computer Science (Cognitive Systems)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|--------------------------|---------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - I | | | | | | | | | | |
| 19LSU101 | Language –I | IV | d,e | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU101 | Programming Fundamentals using C / C++ | I | a,b,c | 05 | - | - | 5 | 40 | 60 | 100 |
| 19CGU102 | Operating Systems | I | b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU103 | Computer Fundamentals | III | h,j | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU111 | Programming Fundamentals using C / C++ - Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU112 | Operating Systems – Practical | I | a,c,g | - | - | 03 | 2 | 40 | 60 | 100 |
| 19CGU113 | Problem solving using worksheets – Practical | III | b,h,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19AEC101 | Environmental Studies | IV | d,e | 03 | - | - | 3 | 40 | 60 | 100 |
| Semester Total | | | | 20 | - | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – II | | | | | | | | | | |
| 19LSU201 | Language – II | IV | d,e | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ENU201 | English | II | d,f | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU201 | Computer Networks | I | c,h,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU202 | Discrete Structures | IV | e,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU203 | Information Technology Information Library | III | a,b | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU211 | Computer Networks – Practical | I | a,c,h,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU212 | Discrete Structures – Practical | IV | c,e | - | - | 03 | 2 | 40 | 60 | 100 |
| 19CGU213 | Web Technologies - Practical | III | a,b,j | - | - | 03 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 20 | - | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – III | | | | | | | | | | |
| 19CGU301 | Data Structures | I | a,b,g,h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU302 | Python Programming | III | a,b,h,k | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU303 | Virtualization and Cloud | III | a,b,j,k | 04 | - | - | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|--|-----|-----------|-----------|----------|-----------|-----------|------------|------------|------------|
| 19CGU304A | Infrastructure Management | I | a,b,c,m | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CGU304B | XML Programming | IV | c,d,e,i | | | | | 40 | 60 | 100 |
| 19CGU311 | Data Structures – Practical | I | a,b,g,h | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU312 | Python Programming- Practical | III | a,b,h,k | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU313 | Virtualization and Cloud – Practical | III | a,b,j,k | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU314A | Infrastructure Management – Practical | I | a,b,c,m | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CGU314B | XML Programming – Practical | IV | c,d,e,i | - | - | 03 | | 40 | 60 | 100 |
| Semester Total | | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19CGU401 | Programming in JAVA | I | a,b,c,m | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU402 | Database Management System | IV | c,d,e,l | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU403 | Cognition and Problem Solving | I | a,b,g,h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU404A | Process Management | III | a,b,h,j,k | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CGU404B | Programming in MATLAB | III | a,b,h,j,k | | | | | | | |
| 19CGU411 | Programming in JAVA – Practical | I | a,b,c,m | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU412 | Database Management System – Practical | IV | c,d,e,l | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU413 | Design and Analysis of Algorithms – Practical | I | a,b,g,h | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU414A | Devops tools – Practical | III | a,b,h,j,k | | | 03 | 1 | 40 | 60 | 100 |
| 19CGU414B | Programming in MATLAB | III | a,b,h,j,k | | | | | | | |
| Semester Total | | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER –V | | | | | | | | | | |
| 19CGU501A | Introduction to Digital Technology | I | b,e,m | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU501B | Machine Learning | III | a,b,h,j | | - | - | | | | |
| 19CGU502A | Software Testing | II | a,b,h,j | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU502B | Information Security and Cyber Laws | I | c,g | | | | | | | |
| 19CGU503A | Data Mining | I | a,b,h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU503B | Introduction to Data Science | II | d,e,f | | - | - | | | | |
| 19CGU504A | Client Relationship Management | IV | c,e,i,l | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CGU504B | Programming in Visual Basic/Gambas | III | b,h,j,k | | | | | | | |
| 19CGU511A | Introduction to Digital Technology – Practical | I | b,e,m | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU511B | Machine Learning - Practical | III | a,b,h,j | - | - | | | | | |
| 19CGU512A | Software Testing - Practical | III | a,b,h,j | - | - | 04 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|---------------------|---|-----|-----------|------------|----------|-----------|------------|-------------|-------------|-------------|
| 19CGU512B | Information Security and Cyber Laws– Practical | I | c,g | | | | | | | |
| 19CGU513A | Data Mining – Practical | III | a,b,h | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU513B | Introduction to Data Science – Practical | II | d,e,f | - | - | | | | | |
| 19CGU514A | Client Relationship Management– Practical | IV | c,e,i,l | | | | | | | |
| 19CGU514B | Programming in Visual Basic/Gambas– Practical | III | b,h,j,k | - | - | 03 | 1 | 40 | 60 | 100 |
| | Semester Total | | | 15 | - | 15 | 22 | 320 | 480 | 800 |
| SEMESTER –VI | | | | | | | | | | |
| 19CGU601A | PHP Programming | III | a,b,h,j,k | | | | | | | |
| 19CGU601B | Unix/Linux Programming | IV | c,d,e | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CGU602A | Digital Image Processing | I | a,c,g,m | | | | | | | |
| 19CGU602B | Computer Graphics | I | a,d,g,m | | - | - | 4 | 40 | 60 | 100 |
| 19CGU603A | Artificial Intelligence | V | e,j,l | | | | | | | |
| 19CGU603B | System Programming | I | a,b,h,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CGU611A | PHP Programming – Practical | III | a,b,h,j,k | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CGU611B | Unix/Linux Programming– Practical | IV | c,d,e | | | | | | | |
| 19CGU612A | Digital Image Processing – Practical | I | a,c,g,m | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU612B | Computer Graphics - Practical | I | a,d,g,m | - | - | | | | | |
| 19CGU613A | Artificial Intelligence – Practical | V | e,j,l | | | | | | | |
| 19CGU613B | System Programming – Practical | I | a,b,h,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CGU691 | Project | II | d,e,f,n | 08 | - | - | 6 | 40 | 60 | 100 |
| | ECA / NCC / NSS / Sports / General interest etc | | | Good | | | | | | |
| | Semester Total | | | 15 | - | 15 | 22 | 280 | 420 | 700 |
| | Grand Total | | | 100 | - | 80 | 140 | 1880 | 2820 | 4700 |

* Instruction Hours / Week

Entrepreneur Oriented Courses -Green

Employability Oriented Courses -Blue

Skill Development Oriented Courses -Red

| Ability Enhancement Courses (AEC) | | |
|--|--------------------|-------------------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language –I |
| | 19AEC101 | Environmental Studies |
| II | 19LSU201 | Language –II |
| | 19ENU201 | English |
| IV | 19CGU403 | Cognition and Problem Solving |

| Generic Elective Courses (GE) /Allied Courses | | |
|--|--------------------|---------------------------------|
| Semester | Course Code | Name of the Course |
| II | 19CGU202 | Discrete Structures |
| | 19CGU212 | Discrete Structures – Practical |

| Core Courses (CC) | | |
|--------------------------|--------------------|--|
| Semester | Course Code | Name of the Course |
| I | 19CGU101 | Programming Fundamentals using C / C++ |
| | 19CGU102 | Operating Systems |
| | 19CGU103 | Computer Fundamentals |
| | 19CGU111 | Programming Fundamentals using C / C++ - Practical |
| | 19CGU112 | Operating Systems – Practical |
| | 19CGU113 | Problem solving using worksheets – Practical |
| II | 19CGU201 | Computer Networks |
| | 19CGU203 | Information Technology Information Library |
| | 19CGU211 | Computer Networks – Practical |
| | 19CGU212 | Web Technologies - Practical |
| III | 19CGU301 | Data Structures |
| | 19CGU302 | Python Programming |
| | 19CGU303 | Virtualization and Cloud |
| | 19CGU311 | Data Structures – Practical |
| | 19CGU312 | Python Programming- Practical |
| | 19CGU313 | Virtualization and Cloud – Practical |
| IV | 19CGU401 | Programming in JAVA |
| | 19CGU402 | Database Management System |
| | 19CGU411 | Programming in JAVA – Practical |
| | 19CGU412 | Database Management System – Practical |
| | 19CGU413 | Design and Analysis of Algorithms – Practical |
| V | 19CGU501A | Introduction to Digital Technology |
| | 19CGU501B | Machine Learning |
| | 19CGU511A | Introduction to Digital Technology – Practical |
| | 19CGU511B | Machine Learning - Practical |
| VI | 19CGU603A | Artificial Intelligence |
| | 19CGU603B | System Programming |
| | 19CGU613A | Artificial Intelligence – Practical |
| | 19CGU613B | System Programming – Practical |
| | 19CGU691 | Project |

| Skill Enhancement Courses(SEC) | | |
|---------------------------------------|--------------------|--|
| Semester | Course Code | Name of the Course |
| III | 19CGU304A | Infrastructure Management |
| | 19CGU304B | XML Programming |
| | 19CGU314A | Infrastructure Management – Practical |
| | 19CGU314B | XML Programming – Practical |
| IV | 19CGU404A | Process Management |
| | 19CGU404B | Programming in MATLAB |
| | 19CGU414A | Devops tools – practical |
| | 19CGU414B | Programming in MATLAB |
| V | 19CGU502A | Software Testing |
| | 19CGU502B | Information Security and Cyber Laws |
| | 19CGU512A | Software Testing - Practical |
| | 19CGU512B | Information Security and Cyber Laws– Practical |
| VI | 19CGU601A | PHP Programming |
| | 19CGU601B | Unix / Linux Programming |
| | 19CGU611A | PHP Programming –Practical |
| | 19CGU611B | Unix / Linux Programming – Practical |

| Discipline Specific Elective Courses (DSE) | | |
|---|--------------------|---|
| Semester | Course Code | Name of the Course |
| V | 19CGU503A | Data Mining |
| | 19CGU503B | Introduction to Data Science |
| | 19CGU504A | Client Relationship Management |
| | 19CGU504B | Programming in Visual Basic/Gambas |
| V | 19CGU513A | Data Mining – Practical |
| | 19CGU513B | Introduction to Data Science –Practical |
| | 19CGU514A | Client Relationship Management– Practical |
| | 19CGU514B | Programming in Visual Basic/Gambas– Practical |
| VI | 19CGU602A | Digital Image Processing |
| | 19CGU602B | Computer Graphics |
| | 19CGU612A | Digital Image Processing– Practical |
| | 19CGU612B | Computer Graphics – Practical |

DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS) – M.Sc. Computer Science
(2019–2020 Batch and onwards)
CURRICULUM

PROGRAM OUTCOMES: Post Graduate student of Computer Science programme will be able to

- a. Apply basic concepts of Computer Science to effectively involve in the research.
- b. Design software to meet required needs with realistic constraints such as economical, environmental, social, ethical and sustainable in the field of Computer Science.
- c. Design and conduct experiments as well as to analyze, interpret data on experiments relevant to Computer Science practice.
- d. implement software designs to provide working solutions, including use of appropriate programming languages, web-based systems and tools, design methodologies, and database systems
- e. To attain in depth knowledge and understanding the principles of programming for applying in broad range of languages and open source platforms.
- f. use IT skills and display mature computer literacy
- g. Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to computer science practice.
- h. Communicate effectively on complex research issues with research community and society, such as, being able to comprehend, write effective reports, design documentation and make effective presentations with clear instructions.
- i. Demonstrate knowledge and understanding of the computer science and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- j. Recognize the need for ability to engage in independent and life-long learning.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- k. Exhibit an outstanding association and active contribution in their professional including entrepreneurship using the information in Computer Science.

- l. Contribute effectively as a team member/leader using common tools and adopt latest technologies in education and solve real world problems.
- m. Pursue life-long learning and research in specific fields of Computer Science and develop novel and research oriented methodologies in an effective manner.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO I: Understand analyze and develop computer programs in the areas related to Database systems and Big data Analytics, cloud computing, soft computing, IoT, Image processing, Green computing, web designing, mobile computing and networking for efficient design of computer based system of varying complexity.

PEO II: Apply standard software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality for business success.

PEO III: Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.

MAPPING of PEOs and POs

| POs | a | b | c | d | e | f | g | h | i | j | k | l | m |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| PEO1 | X | | X | X | X | X | | | X | X | | X | X |
| PEO2 | X | X | X | X | X | X | X | X | | | X | X | |
| PEO3 | X | | X | X | X | X | | | X | X | X | | X |

DEPARTMENT OF COMPUTER SCIENCE
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| Course code | Name of the course | Object ives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|---------------------------------------|---|---------------------------|-------------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - I | | | | | | | | | | |
| 19CSP101 | Python Programming | I | c, d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP102 | Big Data Analytics | I | a, g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP103 | Cryptography and Network Security | I | b, c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP104 | Cloud Computing | III | b, g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP105A/ 19CSP105B/ 19CSP105C | Wireless and Mobile Computing / Geographical Information Systems / Soft Computing | I III II | b g c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP111 | Python Programming - Practical | I | c, d | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CSP112 | Hadoop – Practical | I | b, c | - | - | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | III | h | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – II | | | | | | | | | | |
| 19CSP201 | Internetworking with TCP/IP | I | c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP202 | Cyber Security | I | b, g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP203 | MongoDB | II | d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP204 | Internet of Things | I | b | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP205A/ 19CSP205B/ 19CSP205C | Artificial Intelligence / Machine Learning/ Neural Networks & Fuzzy logic | III | b, g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP211 | Router Configuration – Practical | I | c | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CSP212 | MongoDB – Practical | II | d | - | - | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | III | h | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| Program Total | | | | 44 | - | 16 | 48 | 560 | 840 | 1400 |

| SEMESTER – III | | | | | | | | | | |
|---------------------------------------|---|-------------------|-------------|----|---|----|----|-----|------|------|
| 19CSP301 | J2EE | I | c, d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP302 | Open Source Technologies | I, II | d g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP303 | Digital Image Processing | I | c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP304 | Green Computing | I, III | d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP305A/ 19CSP305B/ 19CSP305C | Web Engineering / Wireless Application Protocol / Software Project Management | I,II III II | b d f | 4 | - | - | 4 | 40 | 60 | 100 |
| 19CSP311 | J2EE – Practical | I | c, d | - | - | 4 | 2 | 40 | 60 | 100 |
| 19CSP312 | Linux – Practical | I | d g | - | - | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | III | h | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – IV | | | | | | | | | | |
| 19CSP491 | Project and Viva Voce | III | i j | - | - | - | 15 | 80 | 120 | 200 |
| Semester Total | | | | - | - | - | 15 | 80 | 120 | 200 |
| Program Total | | | | 66 | - | 24 | 87 | 920 | 1380 | 2300 |

Entrepreneur Oriented Courses -Green

Employability Oriented Courses -Blue

Skill Development Oriented Courses -Red

Elective courses*

| Elective - 1 | | Elective - 2 | | Elective - 3 | |
|--------------|----------------------------------|--------------|-------------------------------|--------------|-------------------------------|
| Course code | Name of the course (Theory) | Course Code | Name of the course (Theory) | Course Code | Name of the course (Theory) |
| 19CSP105A | Wireless and Mobile Computing | 19CSP205A | Artificial Intelligence | 19CSP305A | Web Engineering |
| 19CSP105B | Geographical Information Systems | 19CSP205B | Machine Learning | 19CSP305B | Wireless Application Protocol |
| 19CSP105C | Soft Computing | 19CSP205C | Neural Networks & Fuzzy logic | 19CSP305C | Software Project Management |

KARPAGAM ACADEMY OF HIGHER EDUCATION
COIMBATORE-21
DEPARTMENT OF COMPUTER SCIENCE, COMPUTER APPLICATIONS &
INFORMATION TECHNOLOGY
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.Sc. Computer Technology
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------------|---|--------------------------|---------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER - I | | | | | | | | | | |
| 19LSU101 | Language – I | IV | d,e | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU101 | Programming Fundamentals using C / C++ | I | a,b,c | 05 | - | - | 5 | 40 | 60 | 100 |
| 19CTU102 | Computer System Architecture | I | b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU103 | Computer Fundamentals | III | h,j | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU111 | Programming Fundamentals using C / C++ -Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU112 | Computer System Architecture - Practical | I | a,c,g | - | - | 03 | 2 | 40 | 60 | 100 |
| 19CTU113 | Computer Fundamentals - Practical | III | b,h,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19AEC101 | Environmental Studies | IV | d,e | 03 | - | - | 3 | 40 | 60 | 100 |
| Semester Total | | | | 20 | - | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – II | | | | | | | | | | |
| 19LSU201 | Language – II | | | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ENU201 | English | II | d,f | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU201 | Programming in JAVA | I | c,h,i | 04 | - | - | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|---|-----|---------|----|---|-----------|-----------|------------|------------|------------|
| 19CTU202 | Discrete Structures | III | a,b | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU203 | Computer Networks and Internet Technologies | IV | e,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU211 | Programming in JAVA - Practical | I | a,c,h,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU212 | Discrete Structures - Practical | III | a,b,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19CTU213 | Computer Networks and Internet Technologies Practical | IV | c,e | - | - | 03 | 2 | 40 | 60 | 100 |
| SEMESTER – III | | | | | | | | | | |
| 19CTU301 | Data Structures | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU302 | Data Communication and Networks | V | b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU303 | Relational Database Management Systems | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU304A | Android Programming | I | a,b,c | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CTU304B | Programming in Python | I | a,b,c | | | | | | | |
| 19CTU311 | Data Structures – Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU312 | Data Communication and Networks – Practical | V | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU313 | RDBMS – Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU314A | Android Programming – Practical | I | a,b,c,g | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CTU314B | Programming in Python – Practical | I | a,b,c,g | - | - | | | | | |
| | | | | | | 30 | 22 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19CTU401 | Operating Systems | II | a,b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU402 | Software Engineering | II | a,b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU403 | Artificial Intelligence | I | a,b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU404A | Scripting Language | I | a,b,c,g | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CTU404B | XML Programming | I | a,b,c,g | | | | | | | |
| 19CTU411 | Operating Systems - Practical | II | b,h,j | - | - | 04 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|----------------------|---|-----|---------|----|---|----|----|-----|-----|-----|
| 19CTU412 | Software Engineering - Practical | II | b,h,j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU413 | Artificial Intelligence - Practical | I | b,h,j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU414A | Scripting Language - Practical | I | a,c,h,i | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CTU414B | XML Programming - Practical | I | a,c,h,i | - | - | | | | | |
| | | | | | | 30 | 22 | 320 | 480 | 800 |
| SEMESTER – V | | | | | | | | | | |
| 19CTU501A | Cryptography and Network Security | V | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU501B | Software Testing | V | a,b,c | | | | | | | |
| 19CTU502A | .NET Programming | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU502B | Network Programming | I | a,b,c | | | | | | | |
| 19CTU503A | Data Mining | III | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU503B | R - Programming | III | a,b,c | | | | | | | |
| 19CTU504A | Digital Image Processing | I | a,b,c | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CTU504B | Multimedia and its Applications | I | a,b,c | | | | | | | |
| 19CTU511A | Cryptography and Network Security - Practical | V | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU511B | Software Testing - Practical | V | a,b,c,g | - | - | | | | | |
| 19CTU512A | .NET Programming - Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU512B | Network Programming - Practical | I | a,b,c,g | - | - | | | | | |
| 19CTU513A | Data Mining - Practical | III | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU513B | R – Programming - Practical | III | a,b,c,g | - | - | | | | | |
| 19CTU514A | Digital Image Processing - Practical | I | a,b,c,g | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CTU514B | Multimedia and its Applications - Practical | I | a,b,c,g | - | - | | | | | |
| | | | | | | 30 | 22 | 320 | 480 | 800 |
| SEMESTER – VI | | | | | | | | | | |
| 19CTU601A | PHP Programming | I | b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|--------------------------------------|-----|---------|----|---|-----|-----|------|------|------|
| 19CTU601B | Unix / Linux Programming | I | a,b,c | | | | | | | |
| 19CTU602A | E-Commerce Technologies | II | b,c,h,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19CTU602B | Cloud Computing | II | b,c,g | | | | | | | |
| 19CTU603A | Big Data Analytics | III | b,c,g | 03 | - | - | 3 | 40 | 60 | 100 |
| 19CTU603B | System Programming | III | b,c,h,i | | | | | | | |
| 19CTU611A | PHP Programming - Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU611B | Unix / Linux Programming - Practical | I | a,b,c,g | - | - | | | | | |
| 19CTU612A | E-Commerce Technologies - Practical | II | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19CTU612B | Cloud Computing - Practical | II | a,b,c,g | - | - | | | | | |
| 19CTU613A | Big Data Analytics - Practical | III | a,b,c,g | - | - | 03 | 1 | 40 | 60 | 100 |
| 19CTU613B | System Programming - Practical | III | a,b,c,g | - | - | | | | | |
| 19CTU691 | Project | IV | i,j | - | - | 08 | 6 | 40 | 60 | 100 |
| | | | | | | | | | | |
| Semester Total | | | | | - | 30 | 22 | 280 | 420 | 700 |
| Program Total | | | | | - | 180 | 140 | 1880 | 2820 | 4700 |

** The colour indicates

* Entrepreneur Oriented courses - green

* Employability Oriented courses- blue

* Skill Development Oriented courses- Red

| Ability Enhancement Courses (AEC) | | |
|-----------------------------------|-------------|-----------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language –I |
| | 19AEC101 | Environmental Studies |
| II | 19LSU201 | Language –II |
| | 19ENU201 | English |

| Generic Elective Courses (GE) /Allied Courses | | |
|---|-------------|--|
| Semester | Course Code | Name of the Course |
| I | 19CTU102 | Computer System Architecture |
| | 19CTU112 | Computer System Architecture - Practical |
| II | 19CTU202 | Discrete Structures |
| | 19CTU212 | Discrete Structures – Practical |

| Core Courses (CC) | | |
|-------------------|-------------|---|
| Semester | Course Code | Name of the Course |
| I | 19CTU101 | Programming Fundamentals using C / C++ |
| | 19CTU103 | Computer Fundamentals |
| | 19CTU111 | Programming Fundamentals using C / C++ -Practical |
| | 19CTU113 | Computer Fundamentals - Practical |
| II | 19CTU201 | Programming in JAVA |
| | 19CTU203 | Computer Networks and Internet Technologies |
| | 19CTU211 | Programming in JAVA - Practical |
| | 19CTU213 | Computer Networks and Internet Technologies - Practical |
| III | 19CTU301 | Data Structures |
| | 19CTU302 | Data Communication and Networks |
| | 19CTU303 | Relational Database Management Systems |
| | 19CTU311 | Data Structures – Practical |
| | 19CTU312 | Data Communication and Networks – Practical |
| | 19CTU313 | RDBMS – Practical |
| IV | 19CTU401 | Operating Systems |
| | 19CTU402 | Software Engineering |

| | | |
|-----------|-----------|--------------------------------------|
| | 19CTU403 | Artificial Intelligence |
| | 19CTU411 | Operating Systems - Practical |
| | 19CTU412 | Software Engineering - Practical |
| | 19CTU413 | Artificial Intelligence - Practical |
| V | 19CTU502A | .NET Programming |
| | 19CTU502B | Network Programming |
| | 19CTU512A | .NET Programming -Practical |
| | 19CTU512B | Network Programming -Practical |
| VI | 19CTU601A | PHP Programming |
| | 19CTU601B | Unix / Linux Programming |
| | 19CTU611A | PHP Programming - Practical |
| | 19CTU611B | Unix / Linux Programming - Practical |
| | 19CTU691 | Project |

| Skill Enhancement Courses(SEC) | | |
|---------------------------------------|--------------------|-----------------------------------|
| Semester | Course Code | Name of the Course |
| III | 19CTU304A | Android Programming |
| | 19CTU304B | Programming in Python |
| | 19CTU314A | Android Programming – Practical |
| | 19CTU314B | Programming in Python – Practical |
| IV | 19CTU404A | Scripting Language |
| | 19CTU404B | XML Programming |
| | 19CTU414A | Scripting Language - Practical |
| | 19CTU414B | XML Programming - Practical |
| V | 19CTU501A | Cryptography and Network Security |

| | | |
|-----------|-----------|---|
| | 19CTU501B | Software Testing |
| | 19CTU511A | Cryptography and Network Security - Practical |
| | 19CTU511B | Software Testing - Practical |
| VI | 19CTU603A | Big Data Analytics |
| | 19CTU603B | System Programming |
| | 19CTU613A | Big Data Analytics - Practical |
| | 19CTU613B | System Programming - Practical |

| Discipline Specific Elective Courses (DSE) | | |
|---|--------------------|---|
| Semester | Course Code | Name of the Course |
| V | 19CTU503A | Data Mining |
| | 19CTU503B | R - Programming |
| | 19CTU504A | Digital Image Processing |
| | 19CTU504B | Multimedia and its Applications |
| | 19CTU513A | Data Mining - Practical |
| | 19CTU513B | R-Programming - Practical |
| | 19CTU514A | Digital Image Processing - Practical |
| | 19CTU514B | Multimedia and Applications - Practical |
| VI | 19CTU602A | E-Commerce Technologies |
| | 19CTU602B | Cloud Computing |
| | 19CTU612A | E-Commerce Technologies -Practical |
| | 19CTU612B | Cloud Computing – Practical |

**KARPAGAM ACADEMY OF HIGHER EDUCATION
COIMBATORE-21
DEPARTMENT OF COMPUTER SCIENCE, COMPUTER
APPLICATIONS & INFORMATION TECHNOLOGY
FACULTY OF ARTS, SCIENCE AND HUMANITIES**

**PROGRAM OUTCOMES :The program must enable students to attain by the time
of graduation**

- a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
- b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- c) An ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
- d) An ability to function effectively on teams to accomplish a common goal
- e) An understanding of professional, ethical, legal, security and social issues and responsibilities
- f) An ability to communicate effectively with a range of audiences
- g) An ability to use current techniques, skills and tools necessary for computing practice
- h) An ability to use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking and web systems and technologies
- i) An ability to effectively integrate IT-based solutions into the user environment
- j) An understanding of best practices and standards and their application

PROGRAM SPECIFIC OUTCOME (PSOs)

- k) Understand analyze and develop computer programs in the areas related to Database systems and Big data Analytics, cloud computing, soft computing, IoT, Image processing, Green computing, web designing, mobile computing and networking for efficient design of computer based system of varying complexity.
- l) Apply standard software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality for business success.
- m) Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.
- n) An ability to produce cost effective, quality and maintainable software products and solutions (services) meeting the global standards and requirements with the knowledge acquired and using the emerging techniques, tools and software engineering methodologies and principles and able to comprehend and write effective

project reports in multidisciplinary environment in the context of changing technologies.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- PEO I : To be a working Information Technology (IT) professional with core competencies that can be used on multi-disciplinary projects
- PEO II : To understand the importance of relationship building within the IT industry
- PEO III : To understand the need for lifelong learning in the exploration and journey in IT
- PEO IV : To understand, evaluate and practice ethical behavior within the IT industry
- PEO V : To be cognizant of security issues and their impacts on industry

MAPPING of PEOs and POs

| POs | a | b | c | D | e | f | f | h | i | j | k | l | m | n |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO I | X | X | X | | | | X | X | X | | | | X | |
| PEO II | | | | X | X | X | | | | | | | | X |
| PEO III | X | X | | | | | | X | | X | X | | | |
| PEO IV | | | X | X | X | | | | X | | | X | | |
| PEO V | | | | | X | | | | | X | | X | | |

**DEPARTMENT OF COMPUTER SCIENCE, COMPUTER
APPLICATIONS & INFORMATION TECHNOLOGY
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.Sc. Information Technology
(2019–2020 Batch and onwards)**

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|--------------------------|---------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - I | | | | | | | | | | |
| 19LSU101 | Language – I | IV | d,e | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU101 | Programming Fundamentals using C / C++ | I | a,b,c | 05 | - | - | 5 | 40 | 60 | 100 |
| 19ITU102 | Computer System Architecture | I | b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU103 | Computer Fundamentals | III | h,j | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU111 | Programming Fundamentals using C / C++ - Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU112 | Computer System Architecture – Practical | I | a,c,g | - | - | 03 | 2 | 40 | 60 | 100 |
| 19ITU113 | Computer Fundamentals - Practical | III | b,h,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19AEC101 | Environmental Studies | IV | d,e | 03 | - | - | 3 | 40 | 60 | 100 |
| Semester Total | | | | 20 | - | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – II | | | | | | | | | | |
| 19LSU201 | Language – II | | | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ENU201 | English | II | d,f | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU201 | Programming in JAVA | I | c,h,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU202 | Discrete Structures | III | a,b | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU203 | Computer Networks and Internet Technologies | IV | e,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU211 | Programming in JAVA - Practical | I | a,c,h,i | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU212 | Discrete Structures - Practical | III | a,b,j | - | - | 03 | 2 | 40 | 60 | 100 |
| 19ITU213 | Computer Networks and Internet Technologies Practical | IV | c,e | - | - | 03 | 2 | 40 | 60 | 100 |
| SEMESTER – III | | | | | | | | | | |
| 19ITU301 | Data Structures | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU302 | Operating Systems | II | a,b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU303 | Relational Database Management Systems | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU304A | Android Programming | I | a,b,c | 03 | - | - | 3 | 40 | 60 | 100 |
| 19ITU304B | Programming in Python | I | a,b,c | | | | | | | |
| 19ITU311 | Data Structures – Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU312 | Operating Systems – Practical | II | b,h,j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU313 | RDBMS – Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU314A | Android Programming – Practical | I | a,b,c,g | - | - | 03 | 1 | 40 | 60 | 100 |
| 19ITU314B | Programming in Python – Practical | I | a,b,c,g | | | | | | | |
| | | | | | | 30 | 22 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19ITU401 | Data Communication and Networks | V | b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU402 | Software Engineering | II | a,b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU403 | Programming in PERL | I | a,b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|---|-----|---------|----|---|-----|-----|------|------|------|
| 19ITU404A | Scripting Language | I | a,b,c,g | 03 | - | - | 3 | 40 | 60 | 100 |
| 19ITU404B | XML Programming | I | a,b,c,g | | | | | | | |
| 19ITU411 | Data Communication and Networks - Practical | V | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU412 | Software Engineering - Practical | II | b,h,j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU413 | Programming in PERL - Practical | I | b,h,j | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU414A | Scripting Language - Practical | I | a,c,h,i | - | - | 03 | 1 | 40 | 60 | 100 |
| 19ITU414B | XML Programming - Practical | I | a,c,h,i | | | | | | | |
| | | | | | | 30 | 22 | 320 | 480 | 800 |
| SEMESTER – V | | | | | | | | | | |
| 19ITU501A | Artificial Intelligence | V | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU501B | Software Testing | V | a,b,c | | | | | | | |
| 19ITU502A | .NET Programming | I | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU502B | Network Programming | I | a,b,c | | | | | | | |
| 19ITU503A | Data Mining | III | a,b,c | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU503B | Machine Learning | III | a,b,c | | | | | | | |
| 19ITU504A | Digital Image Processing | I | a,b,c | 03 | - | - | 3 | 40 | 60 | 100 |
| 19ITU504B | Multimedia and its Applications | I | a,b,c | | | | | | | |
| 19ITU511A | Computer Graphics - Practical | V | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU511B | Software Testing - Practical | V | a,b,c,g | | | | | | | |
| 19ITU512A | .NET Programming -Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU512B | Network Programming -Practical | I | a,b,c,g | | | | | | | |
| 19ITU513A | Data Mining - Practical | III | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU513B | Machine Learning - Practical | III | a,b,c,g | | | | | | | |
| 19ITU514A | Digital Image Processing - Practical | I | a,b,c,g | - | - | 03 | 1 | 40 | 60 | 100 |
| 19ITU514B | Multimedia and Applications - Practical | I | a,b,c,g | | | | | | | |
| | | | | | | 30 | 22 | 320 | 480 | 800 |
| SEMESTER – VI | | | | | | | | | | |
| 19ITU601A | PHP Programming | I | b,c,g | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU601B | Unix / Linux Programming | I | a,b,c | | | | | | | |
| 19ITU602A | E-Commerce Technologies | II | b,c,h,i | 04 | - | - | 4 | 40 | 60 | 100 |
| 19ITU602B | Cloud Computing | II | b,c,g | | | | | | | |
| 19ITU603A | Big Data Analytics | III | b,c,g | 03 | - | - | 3 | 40 | 60 | 100 |
| 19ITU603B | System Programming | III | b,c,h,i | | | | | | | |
| 19ITU611A | PHP Programming - Practical | I | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU611B | Unix / Linux Programming - Practical | I | a,b,c,g | | | | | | | |
| 19ITU612A | E-Commerce Technologies -Practical | II | a,b,c,g | - | - | 04 | 2 | 40 | 60 | 100 |
| 19ITU612B | Cloud Computing – Practical | II | a,b,c,g | | | | | | | |
| 19ITU613A | Big Data Analytics - Practical | III | a,b,c,g | - | - | 03 | 1 | 40 | 60 | 100 |
| 19ITU613B | System Programming - Practical | III | a,b,c,g | | | | | | | |
| 19ITU691 | Project | IV | i,j | - | - | 08 | 6 | 40 | 60 | 100 |
| Semester Total | | | | | - | 30 | 22 | 280 | 420 | 700 |
| Program Total | | | | | - | 180 | 140 | 1880 | 2820 | 4700 |

** The colour indicates

- * Entrepreneur Oriented courses - green
- * Employability Oriented courses- blue
- * Skill DevelopmentOriented courses- Red

| Ability Enhancement Courses (AEC) | | |
|-----------------------------------|-------------|--------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language –I |

| | | |
|-----------|----------|-----------------------|
| | 19AEC101 | Environmental Studies |
| II | 19LSU201 | Language –II |
| | 19ENU201 | English |

| Generic Elective Courses (GE) /Allied Courses | | |
|--|--------------------|---|
| Semester | Course Code | Name of the Course |
| I | 19ITU102 | Computer System Architecture |
| | 19ITU112 | Computer System Architecture - Practical |
| II | 19ITU202 | Discrete Structures |
| | 19ITU212 | Discrete Structures – Practical |
| Core Courses (CC) | | |
| Semester | Course Code | Name of the Course |
| I | 19ITU101 | Programming Fundamentals using C / C++ |
| | 19ITU103 | Computer Fundamentals |
| | 19ITU111 | Programming Fundamentals using C / C++ -Practical |
| | 19ITU113 | Computer Fundamentals - Practical |
| II | 19ITU201 | Programming in JAVA |
| | 19ITU203 | Computer Networks and Internet Technologies |
| | 19ITU211 | Programming in JAVA - Practical |
| | 19ITU213 | Computer Networks and Internet Technologies - Practical |
| III | 19ITU301 | Data Structures |
| | 19ITU302 | Operating Systems |
| | 19ITU303 | Relational Database Management Systems |
| | 19ITU311 | Data Structures – Practical |
| | 19ITU312 | Operating Systems – Practical |
| | 19ITU313 | RDBMS – Practical |
| IV | 19ITU401 | Data Communication and Networks |

| | | |
|-----------|-----------|---|
| | 19ITU402 | Software Engineering |
| | 19ITU403 | Programming in PERL |
| | 19ITU411 | Data Communication and Networks - Practical |
| | 19ITU412 | Software Engineering - Practical |
| | 19ITU413 | Programming in PERL - Practical |
| V | 19ITU502A | .NET Programming |
| | 19ITU502B | Network Programming |
| | 19ITU512A | .NET Programming -Practical |
| | 19ITU512B | Network Programming -Practical |
| VI | 19ITU601A | PHP Programming |
| | 19ITU601B | Unix / Linux Programming |
| | 19ITU611A | PHP Programming - Practical |
| | 19ITU611B | Unix / Linux Programming - Practical |
| | 19ITU691 | Project |

| Skill Enhancement Courses(SEC) | | |
|---------------------------------------|--------------------|-----------------------------------|
| Semester | Course Code | Name of the Course |
| III | 19ITU304A | Android Programming |
| | 19ITU304B | Programming in Python |
| | 19ITU314A | Android Programming – Practical |
| | 19ITU314B | Programming in Python – Practical |
| IV | 19ITU404A | Scripting Language |
| | 19ITU404B | XML Programming |
| | 19ITU414A | Scripting Language - Practical |
| | 19ITU414B | XML Programming - Practical |
| V | 19ITU501A | Artificial Intelligence |
| | 19ITU501B | Software Testing |
| | 19ITU511A | Computer Graphics - Practical |

| | | |
|-----------|-----------|--------------------------------|
| | 19ITU511B | Software Testing - Practical |
| VI | 19ITU603B | System Programming |
| | 19ITU613B | System Programming - Practical |

| Discipline Specific Elective Courses (DSE) | | |
|---|--------------------|---|
| Semester | Course Code | Name of the Course |
| V | 19ITU503A | Machine Learning |
| | 19ITU503B | Data Mining |
| | 19ITU504A | Digital Image Processing |
| | 19ITU504B | Multimedia and its Applications |
| | 19ITU513A | Machine Learning - Practical |
| | 19ITU513B | Data Mining - Practical |
| | 19ITU514A | Digital Image Processing - Practical |
| | 19ITU514B | Multimedia and Applications - Practical |
| VI | 19ITU602A | E-Commerce Technologies |
| | 19ITU602B | Cloud Computing |
| | 19ITU603A | Big Data Analytics |
| | 19ITU603A | Big Data Analytics - Practical |
| | 19ITU612A | E-Commerce Technologies -Practical |
| | 19ITU612B | Cloud Computing – Practical |

BBA
Bachelor of Business Administration
CHOICE BASED CREDIT SYSTEM
(CBCS)

Syllabus
2019 – 2020



DEPARTMENT OF MANAGEMENT
FACULTY OF ARTS, SCIENCE AND HUMANITIES
KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)
(Established Under Section 3 of UGC Act, 1956)
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DEPARTMENT OF MANAGEMENT
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.B.A.
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|-------------------------|---------------------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19LAU101 | Language - I | I, II, III | a, e | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19ENU101 | English – I | I, II, III | a, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BAU101 | Fundamentals of Management and Organizational Behaviour | I, II, III, IV | a, b, c,d,e, f, g,j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU102 | Business Accounting | I, II, III,IV | a, b, c, e, i,j,k | 5 | 1 | 0 | 5 | 40 | 60 | 100 |
| 19AEC101 | Business Communication | I, II, III | a, b, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BAU111 | Fundamentals of Management and Organizational Behaviour (Practical) | I,II,III | a, c, d,e,f,g, h,j | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU112 | Financial software package (Practical) | I,II, III,IV | a, b, c,d,e, j | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 25 | 1 | 4 | 26 | 280 | 420 | 700 |
| SEMESTER – II | | | | | | | | | | |
| 19LAU201 | Language – II | I, II, III | a, e | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19ENU201 | English – II | I, II, III | a, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19BAU201 | Managerial Economics | I, II, III | a, b, c,e, d,j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU202 | Business Mathematics and Statistics | I, II, III | a, b, c, d,e,j,k | 6 | 3 | 0 | 6 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | I,II, III, IV | a, h, e, i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BAU211 | Managerial Economics (Practical) | I, II, III | a,b,c,d,e,f,g, j | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 25 | 3 | 2 | 25 | 240 | 360 | 600 |
| SEMESTER – III | | | | | | | | | | |
| 19BAU301 | Human Resource Management | I, III | a,e | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU302 | Principles of Marketing | I, III | a,e | 6 | 0 | 0 | 5 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Cred it(s) | Maximum Marks | | |
|----------------|--|-------------------------|---------------------------|--------------------------|---|----|------------|---------------|-----|-----|
| 19BAU303 | Management Accounting | I, II, III | a, b, c, d,e | 5 | 1 | 0 | 5 | 40 | 60 | 100 |
| 19BAU304A | IT Tools for Business | I, III | a,e | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BAU304B | E- Commerce | I, III | a,e | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BAU311 | Human Resource Management (Practical) | I, II,III | a, b.c,d,e,f,g,j, k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU312 | Principles of Marketing (Practical) | I, II, III | a, b.c,d,e,f,g,j, k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU313 | Management Accounting (Practical) | I, II, III | a, b.c,d,e,f,g,j, k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU314A | IT Tools for Business (Practical) | I,II, III | a, b, c, e | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BAU314B | E-Commerce (Practical) | I,II, III | a, b, c, e | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 19 | 1 | 10 | 22 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19BAU401 | Legal Aspects for Business | I, II, III, IV | a, b, e,,i, j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU402 | Business Research Methods | I, II, III | a,c,d,e,j,k | 6 | 0 | 0 | 6 | 40 | 60 | 100 |
| 19BAU403 | Financial Management | I, II, III | a, b, c,d, e, j | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19BAU404A | Financial Analysis and Reporting | I, III, IV | a,c,d,e, i,j | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BAU404B | Decision making using SPSS | I, III | a,c,d, j,k | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BAU411 | Legal Aspects for Business (Practical) | I, II, III, IV | a, b,d,e,,i, j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU412 | Business Research Methods (Practical) | I, II, III | a, b.c,d,e,f,g,j, k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU413A | Financial Analysis and Reporting (Practical) | I, II, III | a, b.c,d,e,f,g,j, k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|-------------------------|-----------------------|--------------------------|---|-----|-----------|---------------|-----|-----|
| 19BAU413B | Decision Making Using SPSS (Practical) | I, II, III | a, b,c,d,e, j,k | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 22/20 | 2 | 6/8 | 23 | 280 | 420 | 700 |
| SEMESTER V | | | | | | | | | | |
| 19BAU501A | Investment Analysis and Portfolio Management | I,III | a, e, j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU501B | Banking and Insurance | I,III | a, e, j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU502A | Advertising and Brand Management | I,III | a, e, j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU502B | Retail Management | I,III | a, e, j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU503A | International Trade Procedures and Documentation | I, II, III, IV | a, b, e,,i, j | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BAU503B | Leadership and Team Building | I,II,III | a, b, c,d,e,f,g,j | 6 | 0 | 0 | 4 | 100 | 0 | 100 |
| 19BAU504A | Taxation | I, II, III, IV | a,b,c,d,e,i,j,k | 5 | 1 | 0 | 5 | 40 | 60 | 100 |
| 19BAU504B | Production and Operations Management | I, II, III,IV | a,,c,d,e,h,i,j, k | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU511A | Investment Analysis and Portfolio Management (practical) | I, II, III | a, b,c,d,e,j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU511B | Banking and Insurance (Practical) | I, II, III | a, b,c,d,e,j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU512A | Advertising and Brand Management (practical) | I, II, III | a, b,c,d,e,f,g,j, k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU512B | Retail Management (practical) | I, II, III | a, b, c, d,e, f,g,j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU513A | International Trade Procedures and Documentation (Practical) | I, II, III, IV | a, b,d,e,,i, j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU514A | Taxation (Practical) | I, II, III, IV | a, b,c,d,e,i,j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU514B | Production and Operations Management (Practical) | I, II, III, IV | a, b,c,d,e,f,g,j, k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|---|--|-------------------------|------------------------|--------------------------|-----|-----|-----------|---------------|-----------|-----------|
| Semester Total | | | | 21/24 | 1/0 | 8/6 | 22 | 320/340 | 480/360 | 800/700 |
| SEMESTER – VI | | | | | | | | | | |
| 19BAU601A | Management of Industrial Relations | I, III, IV | a, e,i,j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU601B | Training and Development | I, III | a,e,j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU602A | Excel for Business | I, III | a,e,j,k | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BAU602B | Personality Development and Communication Skills | I,II,III | a, b, d,e,f,g,j | 6 | 0 | 0 | 4 | 100 | 0 | 100 |
| 19BAU603A | Ethics & Corporate Social Responsibility | I, III, IV | a, e,i,j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU603B | Entrepreneurship Development | I, III | a,e,j | 6 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19BAU611A | Management of Industrial Relations (Practical) | I, II, III, IV | a,b,c,d,e,f, g,i,j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU611B | Training and Development (practical) | I, II, III | a, b, c, e, f, g,j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU612A | Excel for Business (Practical) | I,II,III | a, b, c, d, e,j,k | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BAU613A | Ethics & Corporate Social Responsibility (Practical) | I,II,III, IV | a,b,c,d,e,f, g,h,i,j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU613B | Entrepreneurship Development (Practical) | I, II, III | a,b,c,d,e,f, g,h,j,k | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BAU691 | Project | I, II, III | a,b,c,d, e,h,j,k | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| ECA/NCC/NSS/Sports/General Interest etc | | | | | | | | | | Good |
| Semester Total | | | | 22/26 | 0 | 8/4 | 22 | 280/300 | 420/300 | 700/600 |
| Programme Total | | | | | | | 140 | 1720/1760 | 2580/2340 | 4300/4100 |

| ABILITY ENHANCEMENT COURSES | | |
|-----------------------------|-------------|------------------------|
| Semester | Course code | Name of the course |
| I | 19ENU101 | English – I |
| I | 19LAU101 | Language - I |
| I | 19AEC101 | Business Communication |
| II | 19ENU201 | English – II |
| II | 19LAU201 | Language – II |
| II | 19AEC201 | Environmental Studies |

| CORE COURSES | | |
|--------------|-------------|---|
| Semester | Course code | Name of the course |
| I | 19BAU101 | Fundamentals of Management and Organizational Behaviour |
| | 19BAU111 | Fundamentals of Management and Organizational Behaviour (Practical) |
| I | 19BAU102 | Business Accounting |
| | 19BAU112 | Financial software package (Practical) |
| II | 19BAU201 | Managerial Economics |
| | 19BAU211 | Managerial Economics (Practical) |
| II | 19BAU202 | Business Mathematics and Statistics |
| III | 19BAU301 | Human Resource Management |
| | 19BAU311 | Human Resource Management (Practical) |
| | 19BAU302 | Principles of Marketing |
| | 19BAU312 | Principles of Marketing (Practical) |
| | 19BAU303 | Management Accounting |
| | 19BAU313 | Management Accounting (Practical) |
| IV | 19BAU401 | Legal Aspects for Business |
| | 19BAU411 | Legal Aspects for Business (Practical) |
| | 19BAU402 | Business Research Methods |
| | 19BAU412 | Business Research Methods (Practical) |
| | 19BAU403 | Financial Management |

| SKILL ENHANCEMENT COURSES | | |
|---------------------------|-------------|---|
| Semester | Course code | Name of the course |
| III | 19BAU304A | IT Tools for Business |
| | 19BAU314A | IT Tools for Business (Practical) |
| | 19BAU304B | E- Commerce |
| | 19BAU314B | E-Commerce (Practical) |
| IV | 19BAU404A | Financial Analysis and Reporting |
| | 19BAU413A | Financial Analysis and Reporting (Practical) |
| | 19BAU404B | Decision Making Using SPSS |
| | 19BAU413B | Decision Making Using SPSS (Practical) |
| V | 19BAU503A | International Trade Procedure and Documentation |
| | 19BAU513A | International Trade Procedure and Documentation (Practical) |
| | 19BAU503B | Leadership and Team Building |
| VI | 19BAU602A | Excel for Business |
| | 19BAU612A | Excel for Business (Practical) |
| | 19BAU602B | Personality Development and Communication Skills |

| DISCIPLINE SPECIFIC ELECTIVES | | |
|-------------------------------|-------------|--|
| Semester | Course code | Name of the course |
| V | 19BAU501A | Investment Analysis and Portfolio Management |
| | 19BAU511A | Investment Analysis and Portfolio Management (practical) |
| | 19BAU501B | Banking and Insurance |
| | 19BAU511B | Banking and Insurance (Practical) |

| | | |
|-----------|-----------|--|
| | 19BAU502A | Advertising and Brand Management |
| | 19BAU512A | Advertising and Brand Management (practical) |
| | 19BAU502B | Retail Management |
| | 19BAU512B | Retail Management (practical) |
| VI | 19BAU601A | Management of Industrial Relations |
| | 19BAU611A | Management of Industrial Relations (Practical) |
| | 19BAU601B | Training and Development |
| | 19BAU611B | Training and Development (practical) |
| | 19BAU691 | Project |

| GENERIC ELECTIVE | | |
|-------------------------|--------------------|--|
| Semester | Course code | Name of the course |
| V | 19BAU504A | Taxation |
| | 19BAU514A | Taxation (Practical) |
| | 19BAU504B | Production and Operations Management |
| | 19BAU514B | Production and Operations Management (Practical) |
| VI | 19BAU603A | Ethics & Corporate Social Responsibility |
| | 19BAU613A | Ethics & Corporate Social Responsibility (Practical) |
| | 19BAU603B | Entrepreneurship Development |
| | 19BAU613B | Entrepreneurship Development (Practical) |

PROGRAMME OUTCOMES (PO)

- a) Graduates will acquire fundamental knowledge in the Management and its functional domains.
- b) Graduates will gain hands on experience of real time business practices through tutorials, case studies, role plays, projects, workshops and training to facilitate lifelong learning.
- c) Graduates will obtain the ability to analyse and solve the complex business problems using management tools and technologies
- d) Graduates will exhibit critical thinking skills in understanding the real-time managerial issues and advocate creative and innovative solutions.
- e) Graduates will acquire and demonstrate the interpersonal and communication skills to convey and negotiate ideas.
- f) Graduates will attain and exhibit skills to work as team and take effective decisions in achieving the common goals.
- g) Graduates will demonstrate the leadership skills to initiate, lead and deliver the best performance together with the team members.
- h) Graduates will understand various environmental factors and their impact on society and business.
- i) Graduates will demonstrate ethical and socially sustainable code of conduct in personal and professional decision making process.

PROGRAMME SPECIFIC OUTCOMES (PSO)

- j) Graduates will understand the problems faced by the business sector in the current scenario and analyse the practical aspects of Organizational setting and techniques applying theoretical knowledge.
- k) Graduates will acquire the research and technological skills needed to analyze a business situation and prepare and present a management report and take strategic decisions.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

- I. Graduates will gain knowledge on theory and practical aspects of management and functional domains.
- II. Graduates will be equipped with quantitative and qualitative skills to identify, analyze, create opportunities in higher studies, managerial jobs and entrepreneurial ventures.
- III. Graduates evince the importance of lifelong learning by acquiring necessary managerial skills to think strategically and to lead, motivate and manage teams.
- IV. Graduates will become socially responsible and value driven citizens contributing to the sustainable growth of management profession and the community.

| Program Educational Objectives | Program Outcomes | | | | | | | | | | |
|---|------------------|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| Graduates will gain knowledge on theory and practical aspects of management. | √ | √ | | | | | | | | √ | |
| Graduates will be equipped with quantitative and qualitative skills to identify, analyze, create opportunities in higher studies, managerial jobs and entrepreneurial ventures. | √ | √ | √ | √ | | | | | | √ | √ |
| Graduates evince the importance of life-long learning by acquiring necessary managerial skills to think strategically and to lead, motivate and manage teams. | | | √ | √ | √ | √ | √ | | | | √ |
| Graduates will become socially responsible and value driven citizens contributing to the sustainable growth of management profession and the community. | | | √ | √ | √ | √ | √ | √ | √ | | |

MBA
Master of Business Administration
CHOICE BASED CREDIT SYSTEM (CBCS)

Regulations
2019 – 2021



DEPARTMENT OF MANAGEMENT
FACULTY OF ARTS, SCIENCE AND HUMANITIES

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act, 1956)

Pollachi Main Road, Eachanari (Post), Coimbatore – 641 021, Tamil Nadu, India

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DEPARTMENT OF MANAGEMENT
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS) – M.B.A.
CURRICULUM
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|-------------------------|----------------------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19MBAP101 | Fundamentals of Management Organizational Behaviour | I,II | a,b,c,d,e,f, i,j | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBAP102 | Business Communication | I,II,IV | a,b,c,d,e,f, g,i,j | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBAP103 | Managerial Economics | I,II,III,IV | a,b,d,e,f,g, i,j | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19MBAP104 | Legal Aspects of Business | I,II,IV | a,c,d,f,g,h, i,j | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBAP105 | Accounting for Managers | I,II,IV | a,b,c,d,e,f, h,i,j | 4 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19MBAP106 | Statistics for Decision Making | I,III | a,b,c,d,e,f, i,j | 5 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19MBAP111 | MS Office and Tally (Practical) | I,II,III | a,b,c,d,f,i,j | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBAP112 | Case Analysis and Presentation | I,II,III,IV | a,b,c,d,e,f, g,i,j | 0 | 0 | 2 | 1 | 50 | 0 | 50 |
| - | Journal paper Analysis and Presentation | I,II | a,b,c,d,j | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Semester Total | | | | 26 | 3 | 6 | 23 | 330 | 420 | 750 |
| SEMESTER – II | | | | | | | | | | |
| 19MBAP201 | Production and Operations Management | I,II,III,IV | a,b,c,d,e,f, g,h,i,j | 4 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19MBAP202 | Marketing Management | I,II,III,IV | a,b,c,d,e,f, g,h,i,j | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBAP203 | Human Resource Management | I,II,III,IV | a,b,c,d,e,f, g,h,i,j | 4 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBAP204 | Quantitative Techniques | I,II,III | a,b,c,d,e,f, i,j | 4 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19MBAP205 | Financial Management | I,II,III,IV | a,b,c,d,e,f, g,h,i,j | 4 | 1 | 0 | 4 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|-------------------------|---------------------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19MBAP206 | Research Methodology for Management | I,II,III,IV | a,b,c,d,e,f,g,hi,j | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBAP211 | SPSS (Practical) | I,II,III | a,b,c,d,f,i,j | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBAP212 | Team Building and Leadership skills (Practical) | I,II | a,b,c,d,e,f,i,j | 0 | 0 | 2 | 1 | 50 | 0 | 50 |
| - | Journal paper Analysis and Presentation | I,II | a,b,c,d,j | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Semester Total | | | | 26 | 3 | 6 | 25 | 330 | 420 | 750 |
| SEMESTER – III | | | | | | | | | | |
| 19MBAP301 | Corporate Strategy | I,II,III,IV | a,b,c,d,f,g,h,i,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBAP302 | International Business | I,II,III,IV | a,c,d,f,g,h,i,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | +Specialization I Elective 1 | | | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | +Specialization I Elective 2 | | | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | +Specialization II Elective 1 | | | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | +Specialization II Elective 2 | | | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBAP321 | Internship | I,II,III,IV | a,b,c,d,e,f,g,h,i,j | 0 | 0 | 11 | 6 | 80 | 120 | 200 |
| - | Journal paper Analysis and Presentation | I,II | a,b,c,d,j | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Semester Total | | | | 24 | 0 | 11 | 28 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19MBAP401 | Indian Ethos and Business Ethics | I,II,IV | a,f,g,h,i,j | 2 | 0 | 0 | 1 | 50 | 0 | 50 |
| | +Specialization I Elective 3 | - | - | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | +Specialization I Elective 4 | - | - | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | +Specialization I Elective 5 | - | - | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | +Specialization II Elective 3 | - | - | 4 | 0 | 0 | 4 | 40 | 60 | 100 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|-----------------|---|-------------------------|---------------|--------------------------|---|----|-----------|---------------|------|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| | *Specialization II Elective 4 | - | - | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| | *Specialization II Elective5 | - | - | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBAP411 | Communication Practice | I,II | a,b,c,d,e,f,j | 0 | 0 | 2 | 1 | 50 | 0 | 50 |
| - | Journal paper Analysis and Presentation | I,II | a,b,c,d,j | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | Placement Readiness/Field Work | I,II | a,b,c,d,e,f,j | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Semester Total | | | | 33 | 0 | 2 | 26 | 340 | 360 | 700 |
| Programme Total | | | | 109 | 6 | 25 | 102 | 1320 | 1680 | 3000 |
| | | | | | | | | | | |

| Category | SEMESTER 1 | SEMESTER 2 | SEMESTER 3 | SEMESTER 4 | TOTAL |
|---------------------|------------|------------|------------|------------|-------|
| Programme Core | 23 | 25 | 6 | 2 | 56 |
| Programme Electives | | | | | |
| Specialisation 1 | | | 8 | 12 | 20 |
| Specialisation 2 | | | 8 | 12 | 20 |
| Internship | | | 6 | | 6 |
| TOTAL | 23 | 25 | 28 | 26 | 102 |

| SPECIALISATION OFFERED | NO.OF COURSES IN BASKET | COURSES IN SEMESTER 3 | CREDITS | COURSES IN SEMESTER 4 | CREDITS |
|-------------------------------------|-------------------------|-----------------------|---------|-----------------------|---------|
| Finance | 7 | 2 | 8 | 3 | 12 |
| Marketing Management | 7 | 2 | 8 | 3 | 12 |
| Human Resources Management | 7 | 2 | 8 | 3 | 12 |
| Management Information System | 7 | 2 | 8 | 3 | 12 |
| Entrepreneurship | 7 | 2 | 8 | 3 | 12 |
| Micro and Small Business Management | 7 | 2 | 8 | 3 | 12 |
| Business Analytics | 7 | 2 | 8 | 3 | 12 |
| International Business | 7 | 2 | 8 | 3 | 12 |
| Operations Management | 7 | 2 | 8 | 3 | 12 |
| Tourism Management | 7 | 2 | 8 | 3 | 12 |

ELECTIVE LIST - SEMESTER III

| Semester | List of Specializations | Course Code | Name of the Elective Course | PEO | PO |
|----------|-------------------------------------|-------------|---|-------------|-------------------|
| IV | Finance | 19MBAPF303A | Investment Analysis and Portfolio Management | I,II,III,IV | a,b,c,d,e,f,g,j |
| | | 19MBAPF303B | Financial Markets and Services | I,II,IV | a,b,c,d,e,f,g,j |
| | | 19MBAPF303C | Project Appraisal and Finance | I,II,III,IV | a,b,c,d,e,f,g,i |
| | Marketing Management | 19MBAPM303A | Services Marketing | I,II,IV | a,b,c,d,e,f,g |
| | | 19MBAPM303B | Integrated Marketing Communication | I,II,IV | a,b,c,d,e,f,g,i |
| | | 19MBAPM303C | Retail Management | I,II,III,IV | a,b,c,d,e,f,g,i |
| | Human Resources Management | 19MBAPH303A | Industrial Relations and Labour Welfare | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPH303B | Compensation and Benefits Management | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPH303C | Strategic HRM | I,II,IV | a,b,c,d,e,f,g,i |
| | Management Information System | 19MBAPS303A | Enterprise Resource Planning | I,II,III | a,b,c,d,e,f,g,i |
| | | 19MBAPS303B | Managing Software Projects | I,II,III,IV | a,b,c,d,e,f,g,i |
| | | 19MBAPS303C | E-Commerce | I,II,III,IV | a,b,c,d,e,f,g,i |
| | Entrepreneurship | 19MBAPE303A | Technology Management and Intellectual Property Right | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPE303B | Social Entrepreneurship | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPE303C | Venture Capital and Private Equity | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | Micro and Small Business Management | 19MBAPB303A | Planning, Structuring, and Financing Small Business | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPB303B | Finance and Accounting for Small Business: | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPB303C | Marketing for Small Business | I,II,IV | a,b,c,d,e,f,g,h,i |
| | Business Analytics | 19MBAPA303A | Data Mining and Data warehousing | I,II,III,IV | a,b,c,d,e,f,g,i |
| | | 19MBAPA303B | Data Visualization for Managers – Using R and Tableau | I,II,III,IV | a,b,c,d,e,f,g,i |
| | | 19MBAPA303C | Machine Language | I,II,III,IV | a,b,c,d,e,f,g,i |
| | International Business | 19MBAPI303A | International Economics | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPI303B | International Trade procedures and Documentation | I,II,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPI303C | International Logistics Management | I,II,IV | a,b,c,d,e,f,g,h,i |
| | Operations Management | 19MBAPO303A | Supply Chain Management | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPO303B | Operations Strategy | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPO303C | Total Quality Management | I,II,III,IV | a,b,c,d,e,f,g,h,i |
| | Tourism Management | 19MBAPT303A | Tourism Principles, Policies and Practices | I,II,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPT303B | Tourism Products of India | I,II,IV | a,b,c,d,e,f,g,h,i |
| | | 19MBAPT303C | Recreation Management | I,II,IV | a,b,c,d,e,f,g,h,i |

ELECTIVE LIST - SEMESTER IV

| Semester | List of Specializations | Course Code | Name of the Elective Course | PEO | PO |
|----------|-------------------------------------|-------------|---|-------------|---------------------|
| IV | Finance | 19MBAPF402A | Banking and Insurance | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPF402B | Mergers, Acquisitions and Corporate Restructuring | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPF402C | Financial Derivatives | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPF402D | Financial Econometrics | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | Marketing Management | 19MBAPM402A | New Product Development | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPM402B | Consumer Behaviour | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | | 19MBAPM402C | Brand Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPM402D | Sales and Distribution Management | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | Human Resources Management | 19MBAPH402A | Organizational Change and Development | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | | 19MBAPH402B | Performance Management Systems | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | | 19MBAPH402C | Competency Mapping | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | | 19MBAPH402D | Talent Management | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | Management Information Systems | 19MBAPS402A | Information Systems Audit and Control | I,II,III,IV | a,b,c,d,e,f,h,i |
| | | 19MBAPS402B | Knowledge Management | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | | 19MBAPS402C | Digital and Social Media Marketing | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | | 19MBAPS402D | System Analysis and Design | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | Entrepreneurship | 19MBAPE402A | Innovation Management | I,II,III,IV | a,b,c,d,e,f,g,i,j |
| | | 19MBAPE402B | Family Business Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPE402C | Entrepreneurial Leadership | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPE402D | Rural Entrepreneurship | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | Micro and Small Business Management | 19MBAPB402A | Indian Models of Economy, Business and Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPB402B | Institutional support to Small Business | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPB402C | Policy Framework for Small Business | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPB402D | Contemporary Environment in Small Business | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | Business Analytics | 19MBAPA402A | Human Resource Metrics and Analytics | I,II,III | a,b,c,d,e,f,i,j |
| | | 19MBAPA402B | Marketing Analytics | I,II,III | a,b,c,d,e,f,i,j |
| | | 19MBAPA402C | Big Data Analytics | I,II,III | a,b,c,d,e,f,i,j |
| | | 19MBAPA402D | Financial Analytics | I,II,III | a,b,c,d,e,f,i,j |
| | International Business | 19MBAPI402A | International Finance | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPI402B | International Marketing Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPI402C | International HRM | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPI402D | Cross cultural Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | Operations Management | 19MBAPO402A | Sourcing Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPO402B | Material Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPO402C | Supply Chain Analytics | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPO402D | Services Operations Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | Tourism Management | 19MBAPT402A | Travel Agency and Tour Operations | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPT402B | Ecotourism | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPT402C | Event Management | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |
| | | 19MBAPT402D | Healthcare Tourism | I,II,III,IV | a,b,c,d,e,f,g,h,i,j |

PROGRAMME OUTCOMES (PO)

- a. Postgraduates students will be able to acquire in-depth management and functional domain knowledge with an ability to differentiate, evaluate, analyze existing knowledge and apply the new knowledge relevant to the changing business environment.
- b. Postgraduates students will be able to analyze complex business problems critically by applying intellectual and creative developments gained through research based or project based approach of learning.
- c. Postgraduates students will be able to excerpt information from various sources and apply appropriate management techniques and tools to analyze and interpret data demonstrating a higher order thinking skill.
- d. Postgraduates will communicate day-to-day managerial activities confidently and effectively in written and oral communication in the organisation and society at large.
- e. Postgraduates will possess knowledge and understanding of working in teams in order to achieve common goals to exhibit their leadership skills.
- f. Postgraduates will acquire managerial positions or take up entrepreneurial ventures by applying the skills and knowledge gained.
- g. Postgraduates will be able to evaluate the implications of changing environmental factors in global perspective and cross cultural issues that affect the functioning of the organization.
- h. Postgraduates will acquire professional and intellectual integrity, professional code of conduct, ethics and values to contribute for sustainable development of society by becoming socially responsible citizen.

PROGRAMME SPECIFIC OUTCOMES (PSO)

- i. Postgraduates will develop lateral thinking and conceptualization of functional knowledge and put into consideration ethics, safety, diversity, cultural, society and environmental factors while evaluating potential solutions options to solve managerial problems.
- j. Postgraduates will apply the lifelong learning and exhibit high level of commitment to identify a timely opportunity and use business innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

- I. Postgraduates will acquire knowledge of management science and apply it to solve the real-time business problems.
- II. Postgraduates will attain professional skills to develop and communicate strategic, creative and innovative ideas to excel in diverse career path.
- III. Postgraduates will be able to apply the management tools and techniques to implement systematic decision making process.
- IV. Postgraduates will be able to adapt to a rapidly changing global environment and become socially responsible and value driven citizens committed to sustainable growth.

| Program Educational Objectives | Program Outcomes | | | | | | | | | |
|---|------------------|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j |
| Postgraduates will acquire knowledge of management science and apply it to solve the real-time business problems. | √ | | | | | √ | | | √ | √ |
| Postgraduates will attain professional skills to develop and communicate strategic, creative and innovative ideas to excel in diverse career path. | | √ | √ | √ | √ | √ | | | √ | √ |
| Postgraduates will be able to apply the management tools and techniques to implement systematic decision making process. | | √ | √ | √ | | | | | √ | √ |
| Postgraduates will be able to adapt to a rapidly changing global environment and become socially responsible and value driven citizens committed to sustainable growth. | | | | | | | √ | √ | √ | √ |

DEPARTMENT OF MATHEMATICS
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.Sc. Mathematics
(2019–2020 Batch and onwards)

| Course Code | Name of the Course | Objective s and Out Comes | | Instruction Hours / Week | | | Credit(s) | Maximum Marks | | |
|----------------|------------------------------------|---------------------------------|------|-----------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19LSU101 | Language –I | III | n,o | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ENU101 | English | II | n,p | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMU101 | Calculus | II | g, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMU102 | Algebra | II | m | 6 | 1 | 0 | 6 | 40 | 60 | 100 |
| 19MMU103 | Physics I | I | a, c | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMU111 | Calculus-Practical | II | g, e | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19MMU112 | Physics I-Practical | I | a, c | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 22 | 1 | 7 | 26 | 280 | 420 | 700 |
| SEMESTER – II | | | | | | | | | | |
| 19LSU201 | Language – II | | | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMU201 | Differential Equations | I,II | a, l | 5 | 0 | 0 | 5 | 40 | 60 | 100 |
| 19MMU202 | Real Analysis | II | d, m | 6 | 1 | 0 | 6 | 40 | 60 | 100 |
| 19MMU203 | Physics II | I | a, c | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMU211 | Differential Equations –Practical | I,II | a | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19MMU212 | Physics II-Practical | I | a, c | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | I | o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Semester Total | | | | 22 | 1 | 7 | 26 | 280 | 420 | 700 |
| SEMESTER – III | | | | | | | | | | |
| 19MMU301 | PDE and Systems of ODE | I,II | a, l | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMU302 | Group Theory I | II | d, m | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU303A | Logic and Sets | I | f | 4 | 2 | 0 | 4 | 40 | 60 | 100 |
| 19MMU303B | Computer Graphics | I | b, k | | | | | | | |
| 19MMU304 | Introduction to Accounting | III | i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU311 | PDE and Systems of ODE – Practical | II | l | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 20 | 6 | 4 | 22 | 200 | 300 | 500 |
| SEMESTER – IV | | | | | | | | | | |
| 19MMU401 | Numerical Methods | I | h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMU402 | Group Theory II | II | f | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU403A | Graph Theory | II | k | 4 | 2 | 0 | 4 | 40 | 60 | 100 |
| 19MMU403B | Operating System: Linux | I | k | | | | | | | |

| | | | | | | | | | | |
|--|---|------|------|------------|-----------|-----------|------------|-------------|-------------|-------------|
| 19MMU404 | Cost and Management Accounting | III | i | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU411 | Numerical Methods-Practical | I | h, j | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 20 | 6 | 4 | 22 | 240 | 360 | 600 |
| SEMESTER – V | | | | | | | | | | |
| 19MMU501A | Multivariate Calculus | II | e, g | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU501B | Theory of Real Functions | I | e | | | | | | | |
| 19MMU502A | Ring Theory and Linear algebra I | II | m | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU502B | Industrial Mathematics | I,II | a, b | | | | | | | |
| 19MMU503A | Probability and Statistics | I | a | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU503B | Boolean Algebra and Automata Theory | I | k | | | | | | | |
| 19MMU504A | Number Theory | II | j | 4 | 2 | 0 | 4 | 40 | 60 | 100 |
| 19MMU504B | Portfolio Optimization | II, | i | | | | | | | |
| Semester Total | | | | 22 | 8 | 0 | 22 | 160 | 240 | 400 |
| SEMESTER – VI | | | | | | | | | | |
| 19MMU601A | Metric Spaces and Complex Analysis | II | d, m | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU601B | Riemann Integration and Series of Functions | I | c | | | | | | | |
| 19MMU602A | Ring Theory and Linear algebra II | II | m | 6 | 2 | 0 | 6 | 40 | 60 | 100 |
| 19MMU602B | Linear Programming | I,II | a, i | | | | | | | |
| 19MMU603A | Mathematical Modeling | I,II | a, b | 4 | 2 | 0 | 4 | 40 | 60 | 100 |
| 19MMU603B | Differential Geometry | I | e | | | | | | | |
| 19MMU691 | Project | II | n | 8 | 0 | 0 | 6 | 40 | 60 | 100 |
| ECA / NCC / NSS / Sports / General interest etc | | | | | | | | | | Good |
| Semester Total | | | | 24 | 6 | 0 | 22 | 160 | 240 | 400 |
| Grand Total | | | | 130 | 28 | 22 | 140 | 1320 | 1980 | 3300 |

Employability → Blue

Skill development → Red

Entrepreneurship → Green

DEPARTMENT OF MATHEMATICS
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.Sc. Mathematics
(2019–2020 Batch and onwards)

PROGRAM OUTCOMES (POs)

- a. Familiarize the student's physical intuition and thinking process through the understanding of the theory and application of this knowledge to the solution of practical problems.
- b. Acquire insight into the classifications of mathematical models stating examples and the features of good models.
- c. Analyze the motion of particles under the influence of various forces.
- d. Gear up with rigorous mathematical proofs of basic results in analysis.
- e. Acquire knowledge about the line integral and its geometrical applications.
- f. Familiarize some fundamental results and techniques from the theory of groups.
- g. Application of integration in various fields.
- h. Understanding of common numerical methods and how they are used to obtain approximate solutions to intractable mathematical problems.
- i. Analyze and resolve the conflicts of economic situations.
- j. Estimates and check mathematical results for reasonableness.
- k. Ability to formulate mathematical structure for computer and communication systems.
- l. Acquire knowledge about differential equations and integrating factor, separable equations and its applications.
- m. Enrich the facts on functions, relations and systems of linear equations.
- n. An ability to function effectively on teams to accomplish a common goal.
- o. An understanding of professional, ethical, legal, security and social issues and responsibilities.
- p. An ability to communicate effectively with a range of audiences.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- q. Ability to solve diverse situation problems in physics, engineering and other science fields.
- r. Ability to think in a conceptual, analytical and logical manner.
- s. Formulation and evaluation of appropriate mathematical models to optimize the real life problems.

PROGRAM EDUCATIONAL OUTCOMES (PEOs)

PEO I: To enrich the students to solve numerous of physical problems in engineering and biological models.

PEO II : To stimulate the skills needed to pursue careers in education, business and / or industry.

PEO III : To develop the professional and managerial skills, especially in areas requiring the application of quantitative skills.

| POs | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO I | X | X | X | | | | X | X | X | | | | | X | X | X | X | | X |
| PEO II | | | | X | X | X | | | | X | | X | X | | X | | X | | |
| PEO III | X | | | | | | | | X | X | X | | | | | X | | X | X |

DEPARTMENT OF MATHEMATICS
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS) – M.Sc. Mathematics

| Course code | Name of the course | Objectives and Out Comes | | Instruction Hours / Week | | | Credit(s) | Maximum Marks | | |
|---------------------------------------|---------------------------------------|--------------------------|---------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19MMP101 | Algebra | III | a, c, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP102 | Real Analysis | I | a, g, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP103 | Numerical Analysis | I | b, d, g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP104 | Ordinary Differential Equations | II | b, d, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP105A | Advanced Discrete Mathematics | III | e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP105B | Number Theory | I | a, g | | | | | | | |
| 19MMP105C | Combinatorics | II | e | | | | | | | |
| 19MMP106 | Mechanics | II | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP111 | Numerical Analysis - Practical | I | a | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper analysis & Presentation | | | | 2 | - | - | - | - | - | - |
| Semester Total | | | | 26 | 0 | 4 | 26 | 280 | 420 | 700 |
| SEMESTER – II | | | | | | | | | | |
| 19MMP201 | Linear Algebra | III | c, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP202 | Complex Analysis | I | a, c | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP203 | Optimization Techniques | III | f | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP204 | Partial Differential Equations | II | d, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP205A | Graph Theory | I | a | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP205B | Differential Geometry | I | a, g | | | | | | | |
| 19MMP205C | Fundamentals of Actuarial Mathematics | III | b, g | | | | | | | |
| 19MMP206 | Fluid Dynamics | II | c, f | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP211 | Optimization Techniques – Practical | II | g | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper analysis & Presentation | | | | 2 | - | - | - | - | - | - |
| Semester Total | | | | 26 | 0 | 4 | 26 | 280 | 420 | 700 |
| SEMESTER – III | | | | | | | | | | |
| 19MMP301 | Topology | III | c, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP302 | Fuzzy Sets and Fuzzy Logic | III | c, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|---------------------------------------|--------------------------------------|------------|--------------|-----------|----------|-----------|-----------|-------------|-------------|-------------|
| 19MMP303 | Measure Theory | III | f,g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP304 | Mathematical Statistics | I | i,j | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP305A | Formal Languages and Automata Theory | I | e,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP305B | Magnetohydrodynamics | II | e,j | | | | | | | |
| 19MMP305C | Neural Networks | III | b, e | | | | | | | |
| 19MMP306 | Mathematical Methods | II | j,g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP311 | Mathematical Statistics - Practical | I | a | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper analysis & Presentation | | | | 2 | - | - | - | - | - | - |
| Semester total | | | | 26 | 0 | 4 | 26 | 280 | 420 | 700 |
| SEMESTER – IV | | | | | | | | | | |
| 19MMP401 | Functional Analysis | III | c, e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MMP402 | Stochastic Processes | I | g,e,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MMP491 | Project | III | e | - | - | - | 8 | 80 | 120 | 200 |
| Semester total | | | | 7 | 0 | 0 | 15 | 160 | 240 | 400 |
| Grand Total | | | | 85 | 0 | 12 | 93 | 1000 | 1500 | 2500 |

Electives Courses*

| Elective I | | Elective II | | Elective III | |
|--------------------|-------------------------------|--------------------|---------------------------------------|---------------------|--------------------------------------|
| Course code | Name of the course | Course code | Name of the course | Course code | Name of the course |
| 19MMP105A | Advanced Discrete Mathematics | 19MMP205A | Graph theory | 19MMP305A | Formal Languages and Automata Theory |
| 19MMP105B | Number theory | 19MMP205B | Differential Geometry | 19MMP305B | Magneto hydrodynamics |
| 19MMP105C | Combinatorics | 19MMP205C | Fundamentals of Actuarial Mathematics | 19MMP305C | Neural Networks |

Employability → Blue Skill development → Red Entrepreneurship → Green

DEPARTMENT OF MATHEMATICS
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS) – M.Sc. Mathematics

PROGRAMME OUTCOMES (POs)

- a. Solve intricate mathematical problems using the knowledge of pure and applied Mathematics.
- b. Explain the knowledge of modern issues in the field of mathematics.
- c. Proficiency in all lectureship exams approved by UGC.
- d. Solve differential equations governing real life issues.
- e. Pursue further studies and conduct research.
- f. Mathematical lifelong learning through continuous professional development.
- g. Employ technology in solving and understanding mathematical problems.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- h. Acquire knowledge of mathematics and its applications in all the fields.
- i. Acquaint with the recent advances in applied mathematical sciences such as numerical computations and mathematical modeling.
- j. Capable of formulating and analyzing mathematical models of real life applications.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I : To engender problem-solving skills and apply them to the problems of pure and applied Mathematics.

PEO II : To assimilate complicated mathematical concepts and arguments.

PEO III : To enhance your own learning and create mathematical thinking

MAPPING OF POs AND PEOs

| POs | a | b | c | d | e | f | g | h | i | j |
|---------|---|---|---|---|---|---|---|---|---|---|
| PEO I | X | | X | | X | | | X | | X |
| PEO II | X | | | X | | | X | | | X |
| PEO III | | X | | | | X | | | X | |

DEPARTMENT OF MICROBIOLOGY

FACULTY OF ARTS, SCIENCES AND HUMANITIES

UG PROGRAM (CBCS) – B.Sc.

Microbiology (2019–2022 Batch)

| Course code | Name of the course | Objective and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|------------------------|-------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEO s | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER-I | | | | | | | | | | |
| 19LSU101 | Language – I | VII | e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19ENU101 | English | VII | e | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU101 | Introduction to Microbiology and Microbial Diversity | I | a | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19MBU102 | Bacteriology | I | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU103 | Biochemistry - I | I | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU111 | Basic Microbiology - Practical | VI | b | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19MBU112 | Bacteriology - Practical | VI | b | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19MBU113 | Basic Biochemistry - I- Practical | VI | b | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | Semester total | | | 19 | 1 | 10 | 26 | 320 | 480 | 800 |
| SEMESTER-II | | | | | | | | | | |
| 19LSU201 | Language –II | VII | E | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU201 | Biochemistry – II | I | G | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU202 | Microbial Physiology and Metabolism | II | G | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU203 | Microbial genetics | IV | G | 4 | 1 | 0 | 5 | 40 | 60 | 100 |
| 19MBU211 | Biochemistry – II - Practical | VI | B | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19MBU212 | Microbial Physiology and Metabolism - Practical | VI | B | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19MBU213 | Microbial Genetics - Practical | VI | B | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | IV | F | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | Semester total | | | 19 | 1 | 10 | 26 | 320 | 480 | 800 |
| SEMESTER – III | | | | | | | | | | |
| 19MBU301 | Virology | I | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU302 | Food and Dairy Microbiology | IV | h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU303 | Industrial Microbiology | IV | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU304A | Microbial Quality Control in Food and Pharmaceutical Industries | IV | h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBU304B | Microbial Diagnosis in Health Clinic | | | | | | | | | |
| 19MBU311 | Virology - Practical | VI | b | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU312 | Food and Dairy Microbiology - Practical | IV | h | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU313 | Industrial Microbiology - Practical | IV | g | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU314A | Microbial Quality Control in Food and Pharmaceutical Industries - Practical | III | b,h | 0 | 0 | 3 | 1 | 40 | 60 | 100 |
| 19MBU314B | Microbial Diagnosis in Health Clinic -Practical | | | | | | | | | |
| | Semester total | | | 15 | 0 | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – IV | | | | | | | | | | |
| 19MBU401 | Immunology | I | h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU402 | Medical Microbiology | IV | j | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU403 | Environmental Microbiology | I | g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU404A | Biofertilizers and Biopesticides | IV | h,g,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBU404B | Recombinant DNA Technology | | | | | | | | | |

| | | | | | | | | | | |
|----------------------|--|----------|-------|-----------|----------|-----------|------------|-------------|-------------|-------------|
| 19MBU411 | Immunology - Practical | I | h | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU412 | Medical Microbiology - Practical | IV | j | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU413 | Environmental Microbiology - Practical | I | b,g | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU414A | Biofertilizers and Biopesticides - Practical | IV | h,g,i | 0 | 0 | 3 | 1 | 40 | 60 | 100 |
| 19MBU414B | Recombinant DNA Technology – Practical | | | | | | | | | |
| | Semester total | | | 15 | 0 | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – V | | | | | | | | | | |
| 19MBU501A | Management of Human Microbial Diseases | I | J | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU501B | Microbiological Analysis of air and water | IV | | | | | | | | |
| 19MBU502A | Biomathematics and Biostatistics | V | c,d | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU502B | Bioinformatics | VII | | | | | | | | |
| 19MBU503A | Instrumentation and Biotechniques | IV | a,j | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU503B | Plant Pathology | | | | | | | | | |
| 19MBU504A | Microbial Biotechnology | IV | g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBU504B | Inheritance Biology | VI | | | | | | | | |
| 19MBU511A | Management of Human Microbial Diseases - Practical | I IV | j | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU511B | Microbiological Analysis of air and water - Practical | | | | | | | | | |
| 19MBU512A | Biomathematics and Biostatistics - Practical | V VII | d | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU512B | Bioinformatics - Practical | | | | | | | | | |
| 19MBU513A | Instrumentation and Biotechniques - Practical | IV | a,j | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU513B | Plant Pathology - Practical | | | | | | | | | |
| 19MBU514A | Microbial Biotechnology - Practical | IV VI | g | 0 | 0 | 3 | 1 | 40 | 60 | 100 |
| 19MBU514B | Inheritance Biology - Practical | | | | | | | | | |
| | Semester total | | | 15 | 0 | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – VI | | | | | | | | | | |
| 19MBU601A | Mushroom Cultivation | III | h | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU601B | Food Fermentation Techniques | | | | | | | | | |
| 19MBU602A | Biosafety and Intellectual Property Rights | V IV | a | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBU602B | Microbes in Sustainable Agriculture and Development | | | | | | | | | |
| 19MBU603A | Cell Biology | VI | b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19MBU603B | Molecular Biology | | | | | | | | | |
| 19MBU611A | Mushroom Cultivation - Practical | III | h | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU611B | Food Fermentation Techniques - Practical | | | | | | | | | |
| 19MBU612A | Biosafety and Intellectual Property Rights - Practical | V IV | a,i | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBU612B | Microbes in Sustainable Agriculture and Development –Practical | | | | | | | | | |
| 19MBU613A | Cell Biology - Practical | VI | b | 0 | 0 | 3 | 1 | 40 | 60 | 100 |
| 19MBU613B | Molecular Biology - Practical | | | | | | | | | |
| 19MBU691 | Project | IV | b,g | 0 | 0 | 8 | 6 | 40 | 60 | 100 |
| | ECA / NCC / NSS / Sports / General interest etc | | | | | | | Good | | |
| | Semester total | | | 11 | 0 | 19 | 22 | 280 | 420 | 700 |
| | COURSE TOTAL | | | 94 | 2 | 84 | 140 | 1880 | 2820 | 4700 |

*Colour fonts highlights

Red colour : Entrepreneurship course

Green colour : Employability courses

Blue colour : Skill development courses

| Ability Enhancement Courses (AEC) | | |
|-----------------------------------|-------------|-----------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language –I |
| | 19ENU 101 | English |
| II | 19LSU201 | Language –II |
| | 19AEC201 | Environmental Studies |

| Generic Elective Courses (GE) / Allied Courses | | |
|--|-------------|-------------------------------|
| Semester | Course Code | Name of the Course |
| I | 19MBU103 | Biochemistry – I |
| | 19MBU113 | Biochemistry –I - Practical |
| II | 19MBU201 | Biochemistry – II |
| | 19MBU211 | Biochemistry – II – Practical |

| Core Courses (CC) | | |
|-------------------|-------------|--|
| Semester | Course Code | Name of the Course |
| I | 19MBU101 | Introduction to Microbiology and Microbial Diversity |
| | 19MBU102 | Bacteriology |
| | 19MBU111 | Basic Microbiology – Practical |
| | 19MBU112 | Bacteriology – Practical |
| II | 19MBU202 | Microbial Physiology and Metabolism |
| | 19MBU203 | Microbial genetics |
| | 19MBU212 | Microbial Physiology and Metabolism - Practical |
| | 19MBU213 | Microbial Genetics – Practical |
| III | 19MBU301 | Virology |
| | 19MBU302 | Food and Dairy Microbiology |
| | 19MBU303 | Industrial Microbiology |
| | 19MBU311 | Virology - Practical |
| | 19MBU312 | Food and Dairy Microbiology – Practical |
| | 19MBU313 | Industrial Microbiology – Practical |
| IV | 19MBU401 | Immunology |
| | 19MBU402 | Medical Microbiology |
| | 19MBU403 | Environmental Microbiology |
| | 19MBU411 | Immunology - Practical |
| | 19MBU412 | Medical Microbiology - Practical |
| | 19MBU413 | Environmental Microbiology – Practical |
| VI | 19MBU691 | Project |

| Skill Enhancement Courses(SEC) | | |
|--------------------------------|-------------|---|
| Semester | Course Code | Name of the Course |
| III | 19MBU304A | Microbial Quality Control in Food and Pharmaceutical Industries |
| | 19MBU304B | Microbial Diagnosis in Health Clinic |
| III | 19MBU314A | Microbial Quality Control in Food and Pharmaceutical Industries - Practical |
| | 19MBU314B | Microbial Diagnosis in Health Clinic -Practical |
| IV | 19MBU404A | Biofertilizers and Biopesticides |
| | 19MBU404B | Recombinant DNA Technology |
| IV | 19MBU414A | Biofertilizers and Biopesticides - Practical |
| | 19MBU414B | Recombinant DNA Technology – Practical |
| V | 19MBU501A | Management of Human Microbial Diseases |
| | 19MBU501B | Microbiological Analysis of air and water |
| | 19MBU502A | Biomathematics and Biostatistics |

| | | |
|-----------|-----------|---|
| | 19MBU502B | Bioinformatics |
| V | 19MBU511A | Management of Human Microbial Diseases - Practical |
| | 19MBU511B | Microbiological Analysis of air and water - Practical |
| | 19MBU512A | Biomathematics and Biostatistics - Practical |
| | 19MBU512B | Bioinformatics - Practical |
| VI | 19MBU601A | Mushroom Cultivation |
| | 19MBU601B | Food Fermentation Techniques |
| VI | 19MBU611A | Mushroom Cultivation – Practical |
| | 19MBU611B | Food Fermentation Techniques - Practical |

| Discipline Specific Elective Courses (DSE) | | |
|---|--------------------|--|
| Semester | Course Code | Name of the Course |
| V | 19MBU503A | Instrumentation and Biotechniques |
| | 19MBU503B | Plant Pathology |
| | 19MBU504A | Microbial Biotechnology |
| | 19MBU504B | Inheritance Biology |
| V | 19MBU513A | Instrumentation and Biotechniques - Practical |
| | 19MBU513B | Plant Pathology – Practical |
| | 19MBU514A | Microbial Biotechnology – Practical |
| | 19MBU514B | Inheritance Biology – Practical |
| VI | 19MBU602A | Biosafety and Intellectual Property Rights |
| | 19MBU602B | Microbes in Sustainable Agriculture and Development |
| | 19MBU603A | Cell Biology |
| | 19MBU603B | Molecular Biology |
| | 19MBU612A | Biosafety and Intellectual Property Rights - Practical |
| | 19MBU612B | Microbes in Sustainable Agriculture and Development -Practical |
| | 19MBU613A | Cell Biology – Practical |
| | 19MBU613B | Molecular Biology - Practical |

Undergraduate Programme – B.Sc Microbiology

Programme Outcomes of UG Microbiology: Students of all undergraduate microbiology degree Programmes at the time of graduation will be able to

- a. Scientific Knowledge: Microbiology majors able to make observations, develop hypotheses, and design and execute experiments using advanced methods. Able to discuss science and scientific methodology. They will have a good knowledge of Intellectual Property Rights.
- b. Laboratory Skills: Microbiology students will master the following laboratory skills: aseptic culture techniques, microscopy, use of appropriate methods to identify microorganisms and to use high laboratory equipments. They are able to practice safe microbiology, using appropriate protective and emergency procedures.
- c. Data analysis skills: Systematically collect, record, and analyze data, identify sources of error, interpret the results, and reach logical conclusions.
- d. Problem-Solving Skills: Microbiology students will be able to analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations. Use mathematical and graphing skills and reasoning to solve problems in microbiology.
- e. Communication Skills: Microbiology majors will demonstrate competence in written and oral communication.
- f. Cooperation/Social Responsibility: Microbiology majors able to understand and appreciate the value of cooperating and working effectively with peers and be able to demonstrate a commitment to the process of developing such skills.
- g. Able to understand the importance of microorganisms in various industries such as pharmaceuticals, food, biofertilizers and biopesticides etc, Students will have a major knowledge on concepts of immunology, biotechnology, molecular biology, biochemistry, genetics. Able to explain the beneficial and harmful role of microorganisms in environment.

Programme Specific Outcomes (PSOs)

- h. Students will have a major knowledge on concepts of immunology, biotechnology, molecular biology, biochemistry, genetics. Able to explain the beneficial and harmful role of microorganisms in environment. Able to understand the importance of microorganisms in various industries such as pharmaceuticals, food, biofertilizers and biopesticides etc,
- i. Describe how microorganisms are used as model systems to study basic biology, genetics, metabolism and ecology.
- j. Identify ways microorganisms' play an integral role in disease, and microbial and immunological methodologies are used in disease treatment and prevention.

PROGRAMME EDUCATIONAL COURSE OBJECTIVES (PEOs)

Programme Educational COURSE OBJECTIVES of UG Microbiology: The major COURSE OBJECTIVES of the undergraduate course is

PEO-I: To impart knowledge on basic concepts of microbiology. To understand the beneficial and harmful role of microorganisms in the environment.

PEO-II: To understand the fundamentals of physiological reactions including metabolic pathways and biochemical reactions in microorganisms.

PEO-III: To develop human resource and entrepreneurs in Microbiology with the ability to independently start their own ventures or small biotech units in the field of biotechnology.

PEO-IV: Understand modern microbiology - practices and approaches with an emphasis in technology application in pharmaceutical, medical, industrial, environmental and agricultural areas.

PEO-V: Become familiar with public policy, bio-safety, and intellectual property rights issues related to microbiology applications nationally and globally

PEO-VI: Gain experience with standard bioinstrumentations and molecular tools and approaches utilized: manipulate genes, gene products and organisms.

PEO-VII: To demonstrate the written and oral communication skill. To develop the problem solving and data interpretation skills.

| POs | a | b | c | d | e | F | g | h | i | j |
|---------|---|---|---|---|---|---|---|---|---|---|
| PEO I | X | X | | | | | | X | | X |
| PEO II | X | X | | | | | | X | X | |
| PEO III | X | X | | X | | | X | X | | |
| PEO IV | | X | | X | | | X | | X | |
| PEO V | X | | | | | X | | | | X |
| PEO VI | | X | X | X | | | | X | X | X |
| PEO VII | X | X | X | X | X | X | X | | | X |

DEPARTMENT OF MICROBIOLOGY
FACULTY OF ARTS, SCIENCES AND HUMANITIES
PG PROGRAM – M. Sc. Microbiology
(2019 – 2020 Batch & onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit (s) | Marks | | |
|---------------------------------------|---|--------------------------|-------|--------------------------|---|---|------------|-------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| SEMESTER-I | | | | | | | | | | |
| 19MBP101 | Fundamentals of Microbiology and Classification | I | a | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP102 | Microbial Physiology and Metabolism | II | a | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP103 | Molecular genetics | II | b | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP104 | Bioinstrumentation | VI | b | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19MBP105A | Marine microbiology | I | a | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP105B | Computer applications and Bioinformatics | VII | c,d | | | | | | | |
| 19MBP105C | Biochemistry | II | A | | | | | | | |
| 19MBP111 | Basic Practical – I | VI | b, e | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBP112 | Basic Practical – II | VI | b, e | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | IV | c,e | 2 | 0 | 0 | - | - | - | - |
| Semester total | | | | 21 | 1 | 8 | 24 | 280 | 420 | 700 |
| SEMESTER–II | | | | | | | | | | |
| 19MBP201 | Virology | I | a, b | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19MBP202 | Medical Bacteriology | I | a, c | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP203 | Biostatistics and Research Methodology | VI | c,d,g | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP204 | Environmental and agricultural microbiology | I | a,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP205A | Cell biology | I | a,c | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP205B | Quality assurance and quality control | I | a,d,e | | | | | | | |
| 19MBP205C | Bioprocess engineering | IV | a,e | | | | | | | |
| 19MBP211 | Advanced Practical – III | I | b,e,f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBP212 | Advanced Practical – IV | I | b,e,f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | IV | c,e | 2 | 0 | 0 | - | - | - | - |
| Semester total | | | | 21 | 1 | 8 | 24 | 280 | 420 | 700 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit (s) | Marks | | |
|---------------------------------------|---|--------------------------|-------|--------------------------|---|---|------------|-------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| SEMESTER-III | | | | | | | | | | |
| 19MBP301 | Advanced Immunology | II | b,d | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP302 | Food Microbiology | IV | a,c | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP303 | Medical Mycology and Parasitology | I | a,e,f | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP304 | Microbial Technology and Intellectual Property Rights | V | b,d | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP305A | Biofertilizer and Biomanure Technology | I | a,i | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 19MBP305B | Laboratory animal care | V | b,d,f | | | | | | | |
| 19MBP305C | Bio nanotechnology | IV | a,d,g | | | | | | | |
| 19MBP311 | Application Oriented Practical – V | I | b,h | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19MBP312 | Application Oriented Practical – VI | I | b,j | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | IV | c,d,e | 2 | 0 | 0 | - | - | - | - |
| Semester total | | | | 22 | 0 | 8 | 24 | 280 | 420 | 700 |

| Course code | Name of the course | Hrs / Week | Marks | | | Exam Hrs | Credit (s) |
|----------------|-----------------------|------------|-------|------|-------|----------|------------|
| | | | CIA | ESE | Total | | |
| SEMESTER – IV | | | | | | | |
| 19MBP491 | Project and Viva Voce | - | 80 | 120 | 200 | - | 15 |
| Semester total | | - | 80 | 120 | 200 | - | 15 |
| | | 90 | 920 | 1380 | 2300 | | 87 |

Elective courses*

| Elective – 1 (I9MBP105) | | Elective – 2 (I9MBP205) | | Elective – 3 (I9MBP305) | |
|-------------------------|--|-------------------------|---------------------------------------|-------------------------|--|
| Course code | Name of the course (Theory) | Course Code | Name of the course (Theory) | Course Code | Name of the course (Theory) |
| 19MBP105A | Marine Microbiology | I9MBP205A | Cell biology | I9MBP305A | Biofertilizer and Biomanure Technology |
| 19MBP105B | Computer Applications and Bioinformatics | I9MBP205B | Quality assurance and quality control | I9MBP305B | Laboratory animal care |
| 19MBP105C | Biochemistry | I9MBP205C | Bioprocess engineering | I9MBP305C | Bio nanotechnology |

*Red colour : Entrepreneurship course / Green colour : Employability courses/ Blue colour : Skill development courses

Postgraduate Programme – M.Sc Microbiology

Programme Outcomes of PG Microbiology: Students of all postgraduate microbiology degree Programmes at the time of graduation will be able to

- a. Science Observation: Microbiology majors able to discuss science and scientific methodology as a way of knowing. Microbiology majors will make observations, develop hypotheses and design and execute experiments using appropriate methods. They will be able to explain how the nature of science is applied to everyday problems.
- b. Laboratory Skills: Microbiology students will master the following laboratory skills: aseptic pure culture techniques, preparation of and viewing samples for microscopy, use appropriate methods to identify microorganisms, estimate the number of microorganisms in a sample and use common lab equipment. They will be able to practice safe microbiology using appropriate protective and emergency procedures. Student able to gain the good knowledge of the development process and the planning process involved in the microbial products and enhance the entrepreneurship.
- c. Data analysis skills: Microbiology majors will be able to systematically collect record and analyze data, identify sources of error, interpret the result and reach logical conclusions. They will be able to appropriately format data into tables, graphs and charts for presentation and publication.
- d. Critical Thinking Skills: Microbiology majors will be able to (1) differentiate between fact and opinion, (2) recognize and evaluate author bias and rhetoric, (3) develop inferential skill, (4) recognize logical fallacies and faulty reasoning and (5) make decisions and judgments by drawing logical conclusions using sound quantitative and statistically – based reasoning.
- e. Problem Solving Skills: Microbiology majors will be competent problem-solvers. They should be able to assess the elements of a problem and develop and test a solution based on logic and the best possible information. Microbiology students should be able to analyze and interpret results from a variety of microbiological methods and apply these methods to analogous situations. They will use mathematical and graphing skills and reasoning to solve problems in microbiology

Programme Specific Outcomes (PSOs)

- f. Upon master graduation, Microbiology majors will mastered a set of advanced skills, which would be useful to function effectively as professionals and to their continued development and learning within the field of Microbiology.
- g. Our candidates will be able to explain why microorganisms are ubiquitous in nature, inhabiting a multitude of habitats and occupying a wide range of ecological habitats.
- h. Able to cite examples of the vital role of microorganisms in biotechnology, fermentation, medicine and other industries important to human well being.
- i. Able to demonstrate that microorganisms have an indispensable role in the environment, including elemental cycles, biodegradation etc.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Programme Educational Objectives of PG Microbiology: The major objectives of the postgraduate course is

PEO-I: To provide detailed knowledge of Microbiology (bacteriology, virology, parasitology and mycology) and their application fields (Medical, Agricultural and Marine Microbiology). To understand the beneficial and harmful role of microorganisms in the environment and in the industries.

PEO-II: To understand the fundamentals of physiological reactions including metabolic pathways and biochemical reactions in microorganisms. To understand the fundamental concepts of immunology, biochemistry, biotechnology and genetics etc.

PEO-III: To develop human resource and entrepreneurs in Microbiology with the ability to independently start their own ventures or small biotech units in the field of biotechnology.

PEO-IV: Understand modern microbiology - practices and approaches with an emphasis in technology application in pharmaceutical, medical, industrial, environmental and agricultural areas.

PEO-V: Gain experience with standard molecular tools and approaches utilized: manipulate genes, gene products and organisms. Become familiar with handling of Laboratory animals for the research purpose. Interpret differences in data distributions via visual displays.

PEO-VI: Become familiar with public policy, biosafety, bioinformatics and intellectual property rights issues related to microbiology applications.

| Pos | A | B | c | d | e | f | g | h | I |
|---------|---|---|---|---|---|---|---|---|---|
| PEO I | X | X | | | | X | X | X | |
| PEO II | X | X | | | | X | | | X |
| PEO III | X | | X | X | X | X | | | |
| PEO IV | X | | | | | X | X | X | X |
| PEO V | | X | X | X | | | | | |
| PEO VI | | | | X | X | X | | | X |

B.Sc. PHYSICS

CHOICE BASED CREDIT SYSTEM (CBCS)

Curriculum and Syllabus

Students admitted from 2019 onwards



DEPARTMENT OF PHYSICS

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University Established Under Section 3 of UGC Act, 1956)

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PREAMBLE

The B.Sc. Physics course is conducted with the following objectives:

- To update the knowledge of the students in one of the most important basic sciences, namely PHYSICS.
- To update the knowledge of a person in the latest fields of science like Atomic and Nuclear Physics, Laser Physics, Materials Science, Nano Technology, Astrophysics etc.
- To motivate and support young talented researchers in their research activities.
- To prepare the students to fit into National Laboratories like CSIR laboratories and National Physical Laboratories etc., as working personnel. Also to make them to work in Universities and colleges as teachers.
- To enhance the knowledge of the structure and evolution of the Universe, fundamental properties of matter and energy through the support of leading edge research.
- To provide efficient and resourceful hands to help in inter-disciplinary areas where basic and advanced knowledge in physics is utilized.

DEPARTMENT OF PHYSICS
FACULTY OF ARTS, SCIENCE AND HUMANITIES
UG PROGRAM (CBCS) – B.Sc. Physics
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|--------------------------|-----|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER – I | | | | | | | | | | |
| 19LSU101 | Language – I | 2 | I | 4 | - | - | 4 | 40 | 60 | 100 |
| 19ENU101 | English | 2 | G | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU101 | Mechanics | 1,3 | A | 5 | - | - | 5 | 40 | 60 | 100 |
| 19PHU102 | Properties Of Matter And Acoustics | 1,6 | A | 5 | - | - | 5 | 40 | 60 | 100 |
| 19PHU103 | Mathematics –I | 5 | e,h | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU111 | Mechanics Practical | 1,6 | E | - | - | 2 | 1 | 40 | 60 | 100 |
| 19PHU112 | Properties Of Matter And Acoustics Practical | 6 | E | - | - | 2 | 1 | 40 | 60 | 100 |
| 19PHU113 | Mathematics Practical-I | 4,5 | E | - | - | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 22 | | 8 | 26 | 320 | 480 | 800 |
| SEMESTER – II | | | | | | | | | | |
| 19LSU201 | Language –II | 2 | I | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU201 | Electricity and Magnetism | 1,3 | A | 6 | - | - | 6 | 40 | 60 | 100 |
| 19PHU202 | Analog Systems and Applications | 2 | A | 5 | - | - | 5 | 40 | 60 | 100 |
| 19PHU203 | Mathematics – II | 5 | H | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU211 | Electricity and Magnetism Practical | 1,6 | E | - | - | 2 | 1 | 40 | 60 | 100 |
| 19PHU212 | Analog Systems and Applications Practical | 5 | E | - | - | 2 | 1 | 40 | 60 | 100 |
| 19PHU213 | Mathematics Practical– II | 4 | E | - | - | 4 | 2 | 40 | 60 | 100 |
| 19AEC201 | Environmental Studies | 3 | D | 3 | - | - | 3 | 40 | 60 | 100 |
| Semester Total | | | | 22 | | 8 | 26 | 320 | 480 | 800 |

| SEMESTER – III | | | | | | | | | | |
|----------------|--|---|------|----|---|----|----|-----|-----|-----|
| 19PHU301 | Thermal Physics and Statistical Mechanics | 3 | a,c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU302 | Physics of Electronic Devices and Circuits | 1 | a,e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU303A | Renewable Energy and Energy harvesting | 7 | e,f | 03 | - | - | 3 | 40 | 60 | 100 |
| 19PHU303B | Physics Workshop skill | 7 | e, f | | | | | | | |
| 19PHU304 | Chemistry –I | 7 | I | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU311 | Thermal Physics and Statistical Mechanics -Practical | 6 | a,e | - | - | 4 | 2 | 40 | 60 | 100 |
| 19PHU312 | Physics of Electronic Devices and Circuits Practical | 6 | a,e | - | - | 4 | 2 | 40 | 60 | 100 |
| 19PHU313A | Renewable Energy and Energy harvesting Practical | 6 | e | - | - | 3 | 1 | 40 | 60 | 100 |
| 19PHU313B | Physics Workshop skill Practical | 6 | e | | | | | | | |
| 19PHU314 | Chemistry Practical–I | 6 | e | - | - | 4 | 2 | 40 | 60 | 100 |
| | Semester total | | | 15 | | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – 4 | | | | | | | | | | |
| 19PHU401 | Waves and optics | 3 | a,c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU402 | Nuclear and Particle physics | 1 | j | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU403A | Basic Instrumentation Skill | 2 | f | 3 | - | - | 3 | 40 | 60 | 100 |
| 19PHU403B | Radiation Safety | 1 | a | | | | | | | |
| 19PHU404 | Chemistry –II | 7 | i | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU411 | Wave and Optics Practical | 6 | e | - | - | 04 | 2 | 40 | 60 | 100 |
| 19PHU412 | Nuclear and Particle Physics Practical | 6 | j,f | - | - | 04 | 2 | 40 | 60 | 100 |
| 19PHU413A | Basic Instrumentation Skill Practical | 6 | e | - | - | 3 | 1 | 40 | 60 | 100 |
| 19PHU413B | Radiation Safety Practical | 6 | e | | | | | | | |
| 19PHU414 | Chemistry Practical–II | 6 | e | - | - | 04 | 2 | 40 | 60 | 100 |
| | Semester total | | | 15 | | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – 5 | | | | | | | | | | |

| | | | | | | | | | | |
|--------------|---|---|-------|----|---|----|-----|------|------|------|
| 19PHU501 | Mathematical Physics-I | 5 | c,h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19PHU502 | Electromagnetic Wave Propagation | 3 | a,h | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU503A | Elements of Modern Physics | 1 | c,h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19PHU503B | Medical Physics | 2 | c | | | | | | | |
| 19PHU504A | Computational Skill | 1 | D | 03 | - | - | 3 | 40 | 60 | 100 |
| 19PHU504B | Weather Forecasting | 1 | D | | | | | | | |
| 19PHU511 | Mathematical Physics – I Practical | 4 | h | - | - | 4 | 2 | 40 | 60 | 100 |
| 19PHU512 | Electromagnetic wave Propagation Practical | 6 | e | - | - | 04 | 2 | 40 | 60 | 100 |
| 19PHU513A | Elements of Modern Physics Practical | 6 | e | - | - | 04 | 2 | 40 | 60 | 100 |
| 19PHU513B | Medical Physics Practical | 6 | f | | | | | | | |
| 19PHU514A | Computational Skill Practical | 6 | f | - | - | 03 | 1 | 40 | 60 | 100 |
| 19PHU514B | Weather Forecasting Practical | 6 | e,f | | | | | | | |
| | Semester total | | | 15 | | 15 | 22 | 320 | 480 | 800 |
| SEMESTER – 6 | | | | | | | | | | |
| 19PHU601 | Mathematical Physics-II | 5 | c,h | 04 | - | - | 4 | 40 | 60 | 100 |
| 19PHU602 | Solid State Physics | 7 | c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU603A | Nano Materials and Applications | 2 | f | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHU603B | Biological Physics | 3 | f | | | | | | | |
| 19PHU611 | Mathematical Physics Practical - II | 5 | e,h | - | - | 04 | 2 | 40 | 60 | 100 |
| 19PHU612 | Solid State Physics Practical | 1 | e | - | - | 04 | 2 | 40 | 60 | 100 |
| 19PHU613A | Nano Materials and Applications Practical | 6 | e,f | - | - | 04 | 2 | 40 | 60 | 100 |
| 19PHU613B | Biological Physics Practical | 6 | f | | | | | | | |
| 19PHU691 | Project | 8 | a,e,g | 06 | - | - | 4 | 40 | 60 | 100 |
| | Semester total | | | 18 | | 12 | 22 | 280 | 420 | 700 |
| | | | | | | | | | | |
| | ECA / NCC / NSS / Sports / General interest etc | | | | | | | | | |
| | G. Total | | | | | | 140 | 1880 | 2820 | 4700 |

| Ability Enhancement Courses (AEC) | | |
|-----------------------------------|-------------|-----------------------|
| Semester | Course Code | Name of the Course |
| I | 19LSU101 | Language –I |
| | 19ENU 101 | English |
| II | 19LSU201 | Language –II |
| | 19AEC201 | Environmental Studies |

| Generic Elective Courses (GE) / Allied Courses | | |
|--|-------------|---------------------------|
| Semester | Course Code | Name of the Course |
| I | 19PHU103 | Mathematics –I |
| | 19PHU113 | Mathematics Practical-I |
| II | 19PHU203 | Mathematics – II |
| | 19PHU213 | Mathematics Practical– II |
| III | 19PHU304 | Chemistry –I |
| | 19PHU314 | Chemistry Practical–I |
| IV | 19PHU404 | Chemistry –II |
| | 19PHU414 | Chemistry Practical–II |

| Core Courses (CC) | | |
|-------------------|-------------|--|
| Semester | Course Code | Name of the Course |
| I | 19PHU101 | Mechanics |
| | 19PHU102 | Properties Of Matter And Acoustics |
| | 19PHU111 | Mechanics Practical |
| | 19PHU112 | Properties Of Matter And Acoustics Practical |
| II | 19PHU201 | Electricity and Magnetism |
| | 19PHU202 | Analog Systems and Applications |
| | 19PHU211 | Electricity and Magnetism Practical |
| | 19PHU212 | Analog Systems and Applications Practical |
| III | 19PHU301 | Thermal Physics and Statistical Mechanics |

| | | |
|-----------|----------|--|
| | 19PHU302 | Physics of Electronic Devices and Circuits |
| | 19PHU311 | Thermal Physics and Statistical Mechanics -Practical |
| | 19PHU312 | Physics of Devices and Communication Practical |
| IV | 19PHU401 | Waves and optics |
| | 19PHU402 | Nuclear and Particle physics |
| | 19PHU411 | Wave and Optics Practical |
| | 19PHU412 | Nuclear and Particle Physics Practical |
| V | 19PHU501 | Mathematical Physics-I |
| | 19PHU502 | Electromagnetic Wave Propagation |
| | 19PHU511 | Mathematical Physics – I Practical |
| | 19PHU512 | Electromagnetic wave Propagation Practical |
| VI | 19PHU601 | Mathematical Physics-II |
| | 19PHU602 | Solid State Physics |
| | 19PHU611 | Mathematical Physics Practical - II |
| | 19PHU612 | Solid State Physics Practical |
| | 19PHU691 | Project |

| Skill Enhancement Courses (SEC) | | |
|--|--------------------|--|
| Semester | Course Code | Name of the Course |
| III | 19PHU303A | Renewable Energy and Energy harvesting |
| | 19PHU303B | Physics Workshop skill |
| III | 19PHU313A | Renewable Energy and Energy harvesting Practical |
| | 19PHU313B | Physics Workshop skill Practical |
| IV | 19PHU403A | Basic Instrumentation Skill |
| | 19PHU403B | Radiation Safety |
| IV | 19PHU413A | Basic Instrumentation Skill Practical |
| | 19PHU413B | Radiation Safety Practical |
| V | 19PHU504A | Computational Skill |
| | 19PHU504B | Weather Forecasting |
| V | 19PHU514A | Computational Skill (Practical) |
| | 19PHU514B | Weather Forecasting (Practical) |

| Discipline Specific Elective Courses (DSE) | | |
|---|--------------------|---|
| Semester | Course Code | Name of the Course |
| V | 19PHU503A | Elements of Modern Physics |
| | 19PHU503B | Medical Physics |
| V | 19PHU513A | Elements of Modern Physics Practical |
| | 19PHU513B | Medical Physics Practical |
| VI | 19PHU603A | Nano Materials and Applications |
| | 19PHU603B | Biological Physics |
| VI | 19PHU613A | Nano Materials and Applications Practical |
| | 19PHU613B | Biological Physics Practical |

Blue- Employability

Green –Entrepreneurship

Red- Skill development

PROGRAMME OUTCOMES (POs)

At the end of the programme, the students will

- a) Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
- b) Realized that knowledge of subjects in other faculties such as humanities, performing arts, social sciences etc. can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.
- c) Demonstrate a rigorous understanding of the core theories & principles of physics, which includes mechanics, electromagnetism, thermodynamics, & quantum mechanics.
- d) Be able to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- e) Gain skill in the acquisition of data using different laboratory instruments and in the analysis and interpretation of data using various algorithms.
- f) Realized how developments in any science subject helps in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments.
- g) Students will be capable of oral and written scientific communication, and will prove that they can think critically and work independently.
- h) Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.
- i) Work and communicate efficiently in inter-disciplinary environment.
- j) Understand the relationship between particles & atom, as well as their creation & decay.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

- k) Enhance the employable skills towards seeking appointments in the relevant areas.
- l) Able to use advanced mathematical tools and algorithms to elucidate the practical problems.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To create strong interest in physics so as students can further develop themselves through self-study.

PEO 2: To prepare the students to successfully compete for employment in Electronics, Manufacturing and Teaching and to offer a wide range of experience in research methods, data analysis to meet the industrial needs.

PEO 3: To equip the students with the ability to utilize the concepts of Physics such as optics, electricity, Magnetism, Thermodynamics etc and their applications in addressing the practical and heuristic issues.

PEO 4: Basic computer programming skills like C, C++, Scilab used in Physics can be used to solve laboratory data analysis.

PEO 5: basic mathematical tools commonly used in physics, including differential and integral calculus, vector calculus, ordinary differential equations, partial differential equations, and linear algebra to solve advanced problems encountered in the fields of applied physics and engineering.

PEO 6: Use basic laboratory equipments and data analysis techniques, including, propagating errors, and also representing data graphically.

PEO 7: To develop strong student competencies in Physics and its applications in a technology-rich, interactive environment.

PEO 8: Make measurements on physical systems understanding the limitations of the measurements and the limitations of models used to interpret the measurements, computationally model the behavior of physical systems, and understand the limitations of the algorithm and the machine.

| Pos | a | b | c | d | e | f | g | h | i | j | k | l |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|
|-----|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|
| PE01 | X | X | | X | | X | | | | X | | |
| PE02 | | | | | | | X | | X | | | |
| PE03 | | | X | | | X | | X | | | X | X |
| PE04 | | | | X | X | | | | | X | | |
| PE05 | X | | X | | X | | | X | | | X | |
| PE06 | | X | | X | | X | | | | | | |
| PE07 | | | X | | | | | X | | X | | |
| PE08 | X | | | | X | | X | | | | | |

M.Sc. PHYSICS
CHOICE BASED CREDIT SYSTEM (CBCS)

Curriculum and Syllabus

Students admitted from 2019 onwards



DEPARTMENT OF PHYSICS
KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University Established Under Section 3 of UGC Act, 1956)
Eachanari Post, Coimbatore – 641 021, INDIA.
Phone: 0422-6453777, 6471113-5, 2980011-2980018;
Fax No: 0422 – 2980022, 2980023
Email: info@karpagam.com
Web: www.kahedu.edu.in

DEPARTMENT OF PHYSICS
FACULTY OF ARTS, SCIENCE AND HUMANITIES
PG PROGRAM (CBCS) – M.Sc. Physics
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|---------------------------------------|--|--------------------------|------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19PHP101 | Condensed Matter Physics | 1, 3 | a | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP102 | Electronic Devices and Circuits | 2,4 | b | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP103 | Classical Mechanics and Relativity | 5 | e | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP104 | Mathematical Physics | 1 | a, b | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP105A/ 19PHP105B/ 19PHP105C | Elective-I | 3, 6 | d, f | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP111 | General Physics Practical – I | 4 | b, f | - | - | 4 | 2 | 40 | 60 | 100 |
| 19PHP112 | Electronics Practical – I | 4 | d | - | - | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | 5,7 | d | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – II | | | | | | | | | | |
| 19PHP201 | Thermodynamics and Statistical Mechanics | 1 | b | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP202 | Quantum Mechanics – I | 3 | c | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP203 | Nuclear Physics | 2 | d | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP204 | Spectroscopy | 5 | g | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP205A/ 19PHP205B/ 19PHP205C | Elective-II | 6,1 | a, f | 4 | - | - | 4 | 40 | 60 | 100 |
| 19PHP211 | General Physics Practical – II | 4 | b, f | - | - | 4 | 2 | 40 | 60 | 100 |
| 19PHP212 | Electronics Practical – II | 4 | d | - | - | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | 5,7 | d | 2 | - | - | - | - | - | - |
| Semester Total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – III | | | | | | | | | | |
| 19PHP301 | Quantum Mechanics – II | 3 | b, f | 4 | - | | 4 | 40 | 60 | 100 |
| 19PHP302 | Laser and its Applications | 4 | e | 4 | - | | 4 | 40 | 60 | 100 |
| 19PHP303 | Electromagnetic theory and Electrodynamics | 7 | a, b | 4 | - | | 4 | 40 | 60 | 100 |
| 19PHP304 | Digital Electronics and Microprocessor | 2 | c | 4 | - | | 4 | 40 | 60 | 100 |
| 19PHP305A | Nanostructures and Characterization | 1 | d | 4 | - | | 4 | 40 | 60 | 100 |
| 19PHP305B | Solar Energy and its utilization | 2, 6 | d | | | | | | | |
| 19PHP305C | Optoelectronics | 2 | d, e | | | | | | | |
| 19PHP311 | Advanced Physics Practical | 4 | b, f | | - | 4 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|---------------------------------------|--------------------------------|-------|---------|-----------|---|----------|-----------|------------|------------|------------|
| 19PHP312 | Advanced Electronics Practical | 4 | d | | - | 4 | 2 | 40 | 60 | 100 |
| Journal Paper Analysis & Presentation | | 5,7 | d | 2 | - | | | | | |
| Semester total | | | | 22 | - | 8 | 24 | 280 | 420 | 700 |
| SEMESTER – IV | | | | | | | | | | |
| 19PHP491 | Project | 1,5,6 | d, e, f | | - | | 15 | 80 | 120 | 200 |
| Total | | | | | - | | 87 | 920 | 1380 | 2300 |

Elective Courses*

| Elective – I (19PHP105) | | Elective – II (19PHP205) | | Elective – III (19PHP305) | |
|-------------------------|-----------------------------|--------------------------|-----------------------------|---------------------------|----------------------------------|
| Course code | Name of the course (Theory) | Course Code | Name of the course (Theory) | Course Code | Name of the course (Theory) |
| 19PHP105A | Material Characterization | 19PHP205A | Digital Signal Processing | 19PHP305A | Nanostructure Characterization |
| 19PHP105B | Astronomy and Astrophysics | 19PHP205B | Computational Physics | 19PHP305B | Solar Energy and its utilization |
| 19PHP105C | Crystal Growth Techniques | 19PHP205C | Thin Film Physics | 19PHP305C | Optoelectronics |

Blue- Employability

Green –Entrepreneurship

Red- Skill development

PROGRAMME OUTCOMES

At the end of the programme, the students will

- Acquire scientific knowledge to identify, analyze and solve the complex problems in the field of theoretical & experimental physics.

b) Apply theoretical knowledge of physics principles and mathematical techniques in research.

c) They can get opportunities after M.Sc. program include doing research in leading national and international universities, laboratories and research institutes.

d) Gain the knowledge and understand the fundamental laws and principles along with its applications in research skills which include advanced laboratory techniques.

e) Gain skill in the acquisition of data using different laboratory instruments and in the analysis and interpretation of data using various algorithms.

PROGRAMME SPECIFIC OUTCOMES

f) Recognize how observation, experiment and theory work together.

g) They acquire the knowledge to design and develop a device to meet the social needs.

h) Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: Understanding the advanced trends in Physics.

PEO 2: Perform procedures as per laboratory standards in the areas like electronics and communications, laser, Nuclear Physics, Solar energy and Thermal Physics.

PEO 3: Analyze the quantum methods in the solution of problems involving atomic spectra, blackbody radiation, the photoelectric effect, X-ray emission, the structure of the atom, and one-dimensional potentials.

PEO 4: To understand the classical experimental techniques and modern measurement technology including analog and digital electronics, laboratory test equipment, optics, lasers, and detectors

PEO 5: To develop and strong student competencies in Physics and its applications in a technology-rich, interactive environment.

PEO 6: To create a sense of ethical responsibilities among students.

PEO 7: To develop and strong student skills in research, analysis and interpretation of complex information.

| Pos | a | b | c | d | e | f | g | h |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|
| PEO1 | | X | | X | X | | | |
| PEO2 | X | | X | | | | | X |
| PEO3 | | | | X | | X | X | X |
| PEO4 | | X | | | X | | | |
| PEO5 | X | X | | X | | X | | |
| PEO6 | X | | X | X | | X | X | X |
| PEO7 | | X | X | | X | | X | X |

FACULTY OF ENGINEERING

B.E. AUTOMOBILE ENGINEERING

(For the regular programme students admitted during 2019-2020 and onwards)

CURRICULUM

SEMESTER I

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total | Hours / Week |
|--------------|--|-----|-----|-----------|----------|----------|-----------|------------|------------|------------|--------------|
| 19BEAE101 | Mathematics - I (Calculus and Linear Algebra for Mechanical and Automobile Engineering) | 2 | 1,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE141 | Engineering Physics | 1,2 | 4 | 3 | 1 | 3 | 5 | 40 | 60 | 100 | 7 |
| 19BEAE142 | Basic Electrical Engineering | 2,4 | 11 | 3 | 1 | 2 | 5 | 40 | 60 | 100 | 6 |
| 19BEAE111 | Engineering Graphics and Design | 2 | 3,4 | 1 | 0 | 4 | 3 | 40 | 60 | 100 | 5 |
| Total | | | | 10 | 3 | 9 | 17 | 160 | 240 | 400 | 22 |

SEMESTER II

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total | Hours / Week |
|-------------|--|-----|----|---|---|---|---|-----|-----|-------|--------------|
| 19BEAE201 | Mathematics - II (Calculus, Ordinary Differential Equations and Complex Variable for Mechanical and Automobile Engineering) | 2 | 1 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE202 | English | 4 | 12 | 2 | 0 | 2 | 3 | 40 | 60 | 100 | 4 |
| 19BEAE241 | Chemistry - I | 1 | 1 | 3 | 1 | 3 | 6 | 40 | 60 | 100 | 7 |

| | | | | | | | | | | | |
|-----------|--|---|-----|-----------|----------|-----------|-----------|------------|------------|------------|-----------|
| 19BEAE242 | Programming for Problem Solving | 2 | 1,2 | 3 | 0 | 4 | 5 | 40 | 60 | 100 | 7 |
| 19BEAE211 | Workshop/Manufacturing Practice Laboratory | 2 | 2,9 | 1 | 0 | 4 | 3 | 40 | 60 | 100 | 5 |
| 19BEAE251 | Constitution of India | 1 | 7 | 1 | 0 | 0 | – | 100 | 0 | 100 | 1 |
| | Total | | | 13 | 2 | 13 | 21 | 300 | 300 | 600 | 28 |

SEMESTER III

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total | Hours / Week |
|-------------|--|-----|-------|-----------|----------|-----------|-----------|------------|------------|-------------|--------------|
| 19BEAE301 | Mathematics - III (PDE, Probability and Statistics) | 2 | 1,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE302 | Engineering Mechanics | 2 | 2,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE303 | Applied Thermodynamics | 2 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE304 | Automotive Engines | 2,3 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE305 | Engineering Metrology and Measurements | 2,3 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE306 | Biology for Engineers | 4 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE311 | Automotive Engine Components and Measurements Laboratory | 2,3 | 2,3 | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEAE312 | Computer Aided Machine Drawing Laboratory | 2,3 | 2,3,4 | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEAE313 | Thermal Engineering Laboratory | 2,3 | 2,3 | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEAE351 | Soft Skills | 4 | 7 | 1 | 0 | 2 | – | 100 | 0 | 100 | 3 |
| | Total | | | 19 | 2 | 11 | 26 | 460 | 540 | 1000 | 32 |

SEMESTER IV

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total | Hours / Week |
|-------------|-----------------------------------|-----|-----|---|---|---|---|-----|-----|-------|--------------|
| 19BEAE401 | Fluid Mechanics and Heat Transfer | 2 | 1,3 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |

| | | | | | | | | | | | |
|-----------|--|-----|---------|-----------|----------|-----------|-----------|------------|------------|------------|-----------|
| 19BEAE402 | Strength of Materials | 2,3 | 1,3,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE403 | Theory of Machines | 2,3 | 1,3,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE404 | Engineering Materials and Metallurgy | 2,3 | 1,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE441 | Automotive Chassis and Transmission | 2,3 | 2,3,4 | 3 | 0 | 3 | 5 | 40 | 60 | 100 | 6 |
| 19BEAE442 | Automotive Electrical and Electronics Systems | 2,4 | 2 | 3 | 0 | 3 | 5 | 40 | 60 | 100 | 6 |
| 19BEAE411 | Fluid Mechanics and Strength of Materials Laboratory | 2,3 | 2,3 | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEAE451 | Course Oriented Project - I | 2,4 | 1,4,8,9 | 0 | 0 | 1 | – | 100 | 0 | 100 | 1 |
| 19BEAE452 | Fuels and Lubricants | 2 | 1,6 | 1 | 0 | 0 | – | 100 | 0 | 100 | 1 |
| | Total | | | 19 | 3 | 10 | 27 | 480 | 420 | 900 | 32 |

SEMESTER V

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total | Hours / Week |
|-------------|--------------------------------------|-----|---------|-----------|----------|----------|-----------|------------|------------|-------------|--------------|
| 19BEAE501 | Design of Machine Elements | 2,3 | 1,2,3,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE502 | IC Engine Design | 2,3 | 1,2,3,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE503 | Vehicle Dynamics | 2,3 | 1,2,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE504 | Environmental Sciences | 1,4 | 1,2,6,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE5E_ | Professional Elective - I | 2 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19B___OE_ | Open Elective - I | 2,4 | 2,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE511 | Dynamics and Mechatronics Laboratory | 2,3 | 1,2,3 | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEAE551 | Course Oriented Project - II | 2,4 | 1,4,8,9 | 0 | 0 | 1 | – | 100 | 0 | 100 | 1 |
| 19BEAE552 | Technical Presentation | 4 | 11 | 0 | 0 | 1 | – | 100 | 0 | 100 | 1 |
| 19BEAE553 | In-plant Training | 2,4 | 1,4,8,9 | 0 | 0 | 0 | – | 100 | 0 | 100 | – |
| | Total | | | 18 | 2 | 5 | 22 | 580 | 420 | 1000 | 25 |

SEMESTER VI

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total | Hours / Week |
|-------------|--|-----|---------|-----------|----------|----------|-----------|------------|------------|-------------|--------------|
| 19BEAE601 | Automotive Chassis Components Design | 2,3 | 1,2,3,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEAE602 | Engineering Economics and Financial Management | 1,4 | 8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE641 | Manufacturing Technology | 2,3 | 1,2,3,4 | 3 | 0 | 3 | 5 | 40 | 60 | 100 | 6 |
| 19BEAE6E_ | Professional Elective - II | 2 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19B__ _OE_ | Open Elective - II | 2,4 | 2,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19B__ _OE_ | Open Elective - III | 2,4 | 2,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE611 | Vehicle Maintenance Laboratory | 2,3 | 1,2,3 | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEAE651 | Mini Project | 2,4 | 1,4,8,9 | 0 | 0 | 2 | 1 | 100 | 0 | 100 | 2 |
| 19BEAE652 | Engine and Vehicle Management System | 2 | 2,9 | 1 | 0 | 0 | – | 100 | 0 | 100 | 1 |
| 19BEAE653 | Essence of Indian Traditional Knowledge | 1 | 11 | 1 | 0 | 0 | – | 100 | 0 | 100 | 1 |
| | Total | | | 20 | 1 | 8 | 24 | 580 | 420 | 1000 | 29 |

SEMESTER VII

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total | Hours / Week |
|-------------|---|-----|-------------|---|---|---|---|-----|-----|-------|--------------|
| 19BEAE701 | Total Quality Management | 1,3 | 7,10, 11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE7E_ | Professional Elective - III | 2 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE7E_ | Professional Elective - IV | 2 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE7E_ | Professional Elective - V | 2 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19B__ _OE_ | Open Elective - IV | 2,4 | 2,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE711 | Computer Aided Design Analysis Laboratory | 2,3 | 1,2,3,4,5 | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |

| | | | | | | | | | | | |
|-----------|---------------------|-----|---------|-----------|----------|----------|-----------|------------|------------|------------|-----------|
| 19BEAE751 | Industrial Robotics | 2 | 2,9 | 1 | 0 | 0 | – | 100 | 0 | 100 | 1 |
| 19BEAE791 | Project Phase - I | 2,4 | 1,4,8,9 | 0 | 0 | 4 | 2 | 100 | 0 | 100 | 4 |
| | Total | | | 16 | 0 | 7 | 19 | 440 | 360 | 800 | 23 |

SEMESTER VIII

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total | Hours / Week |
|-------------|--|-----|------------|----------|----------|-----------|-----------|------------|------------|------------|--------------|
| 19BEAE801 | Professional Ethics and Entrepreneurship Development | 1,3 | 7,10,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE8E_– | Professional Elective - VI | 2 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEAE891 | Project Phase - II | 2,4 | 1,4,8,9 | 0 | 0 | 12 | 6 | 120 | 180 | 300 | 12 |
| | Total | | | 6 | 0 | 12 | 12 | 200 | 300 | 500 | 18 |

TOTAL CREDITS FOR THE PROGRAMME = 168

LIST OF PROFESSIONAL ELECTIVE COURSES

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total |
|---|--|-----|-------------|---|---|---|---|-----|-----|-------|
| Professional Elective - I (Semester V) | | | | | | | | | | |
| 19BEAE5E01 | Automotive Emissions and NVH Control | 1,2 | 2,6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE5E02 | Vehicle Body Engineering | 2,3 | 1,2, 3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE5E03 | Two and Three Wheeler Technology | 2,3 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE5E04 | Tractor and Farm Equipments | 2,3 | 2,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE5E05 | Vibration and Noise Control | 2,3 | 2,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE5E06 | Composite Materials | 2,3 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Elective - II (Semester VI) | | | | | | | | | | |
| 19BEAE6E01 | Advanced Theory of IC Engines | 2,3 | 2,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE6E02 | Automotive Air Conditioning | 2,3 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE6E03 | Automotive Safety | 2,3 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE6E04 | Off-Road Vehicles | 2,3 | 2,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE6E05 | Design for Manufacture and Assembly | 2,3 | 2,3,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE6E06 | Industrial Engineering and Operations Research | 2,3 | 1,,2,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Elective - III (Semester VII) | | | | | | | | | | |
| 19BEAE7E01 | Automotive Aerodynamics | 2,3 | 1,2,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E02 | Automotive Testing | 2,3 | 2,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E03 | Alternate Fuels and Energy Systems | 2,3 | 2,6,8,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E04 | Applied Hydraulics and Pneumatics | 2,3 | 2,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E05 | Optimization for Engineering Design | 2,3 | 2,5,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E06 | Mechatronics | 2,3 | 2,5,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Elective - IV (Semester VII) | | | | | | | | | | |
| 19BEAE7E07 | Modern Vehicle Technology | 2,3 | 2,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E08 | Intelligent Vehicle Technology | 2,3 | 2,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E09 | Manufacturing of Automotive Components | 2,3 | 2,3,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|---|---|-----|-----------|----------|----------|----------|----------|------------|------------|--------------|
| 19BEAE7E10 | Computational Fluid Dynamics | 2,3 | 2,4,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E11 | New Product Development | 2,3 | 2,8,10,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E12 | Lean Manufacturing | 2,3 | 2,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Course Code | Title of the Course | | | L | T | P | C | CIA | ESE | Total |
| Professional Elective - V (Semester VII) | | | | | | | | | | |
| 19BEAE7E13 | Finite Element Analysis | 2,3 | 2,3,4,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E14 | Hybrid Vehicle Technology | 2,3 | 2,6,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E15 | Fuel Cell Technology | 2,3 | 2,6,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E16 | Process Planning and Cost Estimation | 2,3 | 2,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E17 | Product Lifecycle Management | 2,3 | 2,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE7E18 | Computer Integrated Manufacturing | 2,3 | 2,5,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Elective - VI (Semester VIII) | | | | | | | | | | |
| 19BEAE8E01 | Vehicle Maintenance | 2,3 | 2,6,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE8E02 | Fleet Management | 2,3 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE8E03 | Non-Destructive Testing | 2,3 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE8E04 | Non-Traditional Machining Processes | 2,3 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE8E05 | Quality Control and Reliability Engineering | 2,3 | 2,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAE8E06 | Intellectual Property Rights | 2,3 | 2,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

LIST OF OPEN ELECTIVE COURSES

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total |
|-------------------------------------|--|---------|------|---|---|---|---|-----|-----|-------|
| BIOMEDICAL ENGINEERING | | | | | | | | | | |
| 19BEBMEOE01 | Robotics in Medicine | 2, 4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOE02 | Virtual Reality and Augmented Reality | 2,4 | 11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOE03 | Artificial Organs and Implants | 2,4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOTECHNOLOGY | | | | | | | | | | |
| 19BTBTOE01 | Bioreactor Design | 2, 4 | 11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | 2,4 | 9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | 2,4 | 9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nanobiotechnology | 2, 4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CHEMICAL ENGINEERING | | | | | | | | | | |
| 19BTCEOE01 | Energy Management in Chemical Industries | 2, 4 | 6,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE02 | Fertilizer Technology | 2,4 | 9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE03 | Industrial Wastewater Treatment | 2,4 | 9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE04 | Solid and Hazardous Waste Management | 2, 4 | 9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CIVIL ENGINEERING | | | | | | | | | | |
| 19BECEOE01 | Housing, Plan and Management | 2, 4 | 9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE02 | Building Services | 2,4 | 9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE03 | Repair and Rehabilitation of Structures | 2,4 | 9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE04 | Computer Aided Civil Engineering Drawing | 2, 4 | 11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COMPUTER SCIENCE ENGINEERING | | | | | | | | | | |
| 19BECSOE01 | Internet Programming | 2, 4 | 5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSOE02 | Multimedia and Animation | 2,4 | 5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSOE03 | PC Hardware and Troubleshooting | 2,4 | 5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSOE04 | Java Programming | 2, 4 | 5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | | |
|--|-------|---------------------------------------|-----|--------|---|---|---|---|----|----|-----|
| 19BEC | SOE05 | Machine Learning | 2,4 | 5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRICAL AND ELECTRONICS ENGINEERING | | | | | | | | | | | |
| 19BEEE | OE01 | Electric Hybrid Vehicle | 2,4 | 2,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE | OE02 | Energy Management and Energy Auditing | 2,4 | 9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE | OE03 | Programmable Logic Controller | 2,4 | 5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE | OE04 | Renewable Energy Resources | 2,4 | 7,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total |
|--|---|-----|---------|---|---|---|---|-----|-----|-------|
| ELECTRONICS AND COMMUNICATION ENGINEERING | | | | | | | | | | |
| 19BEECOE01 | Real Time Embedded Systems | 2,4 | 2,3,4, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE02 | Consumer Electronics | 2,4 | 11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE03 | Neural Networks and its Applications | 2,4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE04 | Fuzzy Logic and its Applications | 2,4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE05 | Principles of Modern Communication System | 2,4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| FOOD TECHNOLOGY | | | | | | | | | | |
| 19BTFTOE01 | Processing of Food Materials | 2,4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 2,4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 2,4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 2,4 | 9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| MECHANICAL ENGINEERING | | | | | | | | | | |
| 19BEME0E01 | Computer Aided Design | 2,4 | 2,3,4,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E02 | Industrial Safety and Environment | 2,4 | 9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E03 | Transport Phenomena | 2,4 | 2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E04 | Introduction to Biomechanics | 2,4 | 11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| SCIENCE AND HUMANITIES | | | | | | | | | | |
| 19BESH0E01 | Solid Waste Management | 2,4 | 9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E02 | Green Chemistry | 2,4 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E03 | Applied Electrochemistry | 2,4 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E04 | Industrial Chemistry | 2,4 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E05 | Technical Writing | 2,4 | 11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E06 | Geophysics | 2,4 | 9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E07 | Engineering Acoustics | 2,4 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E08 | Industrial Mathematics - I | 2,4 | 1,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|------------|-----------------------------|---------|-----|---|---|---|---|----|----|-----|
| 19BESH0E09 | Industrial Mathematics - II | 2,4 | 1,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E10 | Fuzzy Mathematics | 2, 4 | 1,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E11 | Mathematical Physics | 2,4 | 1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E12 | Linear Algebra | 2,4 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

LIST OF OPEN ELECTIVE COURSES OFFERED BY THE DEPARTMENT OF AUTOMOBILE ENGINEERING FOR
THE STUDENTS OF OTHER PROGRAMS

| Course Code | Title of the Course | PEO | PO | L | T | P | C | CIA | ESE | Total |
|-------------|----------------------------------|---------|------|---|---|---|---|-----|-----|-------|
| 19BEAEOE01 | Automobile Engineering | 2, 4 | 2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Two and Three Wheeler Technology | 2,4 | 2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Vehicle Maintenance | 2,4 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Modern Vehicle Technology | 2, 4 | 2,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE05 | Fleet Management | 2,4 | 2,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

 Skill Development

 Employability Skill

 Entrepreneurship Skill

PROGRAMME EDUCATIONAL OBJECTIVES (PEO'S)

- **1:** Graduates will more conscious about their profession with social awareness and responsibility.
- **2:** Graduates will be engineering experts, who would help solve industry's technological problems.
- **3:** Graduates will be engineering professionals, consultants or entrepreneurs engaged in technology development.
- **4:** Graduates will interact with their peers in other disciplines in industry and society and contribute to the economic growth of the country.

PROGRAMME OUTCOMES (PO'S)

- **1:** Ability to apply knowledge of mathematics and science in solving engineering problems.
- **2:** In-depth knowledge on the fundamental principles, construction and auxiliary systems of automobiles.
- **3:** To understand the principles involved in evaluating the structural, functional and safety requirements of automotive systems.
- **4:** Hands on knowledge to develop analytical skills for designing and analyzing various automobile components and processes.
- **5:** To understand and apply appropriate techniques and IT tools for the design and analysis of automotive systems.
- **6:** Understanding the mechanism of pollutant formation and its control techniques.
- **7:** Understanding of human and ethical responsibilities towards the profession and society.
- **8:** Ability to understand the economics and cost analysis in order to take economically sound decisions.
- **9:** Ability to apply modern techniques and tools necessary for engineering practice with appropriate considerations for public health, safety, cultural and environmental limitations.
- **10:** Understand the impact of engineering solutions in a societal context and to be able to respond effectively to the needs for sustainable development.
- **11:** Function effectively as an individual, and as a member or a leader in diverse teams, and in multi-disciplinary situations.
- **12:** To recognize the need for, and have the ability to engage in independent and lifelong learning.

PROGRAMME SPECIFIC OUTCOMES (PSO'S)

- **13:** Ability to design automobile system, component, or process to meet desired needs of the nation, industries, institutions within realistic constraints such as economic, environmental, social, political, ethical, health care, and safety, manufacturability, and sustainability.

- **14:** Ability to develop and use of software tools and Information Technology for automobile engineering domain.
- **15:** Ability to perform effectively first level managerial responsibilities for large or medium engineering organizations.

| Programme Educational Objectives | Programme Objectives | | | | | | | | | | | | | | |
|----------------------------------|----------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | |
| 2 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | | ✓ | |
| 3 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | ✓ | | ✓ | |
| 4 | | | | | | | | ✓ | | | ✓ | | | | ✓ |

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University Established Under Section 3 of UGC Act 1956)
FACULTY OF ENGINEERING
B.E (BIOMEDICAL ENGINEERING)
COURSE OF STUDY AND SCHEME OF EXAMINATION
(2019 BATCH ONWARDS)

| SEMESTER I | | | | | | | | | | |
|------------|---------------------------------|-----------------------|-----------|------------------------|---|---|---------|---------------|-----|-------|
| Course ode | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEBME101 | Mathematics-I | 1,2,4 | a,f,h,j,k | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEBME141 | Chemistry-I | 4 | a,b,h,j,k | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| 19BEBME142 | Basic Electrical Engineering | 1,4 | a,c,h,j,k | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEBME143 | Programming For Problem Solving | 1,4 | a,b,d,e,j | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| TOTAL | | | | 12 | 3 | 9 | 20 | 160 | 240 | 400 |

| SEMESTER II | | | | | | | | | | |
|-------------|--|-----------------------|---------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEBME201 | Mathematics-II | 1,4 | a,f,h,j,k | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEBME202 | English | 1,4 | f,g,h,j,l | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BEBME203 | Introduction To Biomedical Engineering | 1,2,4 | a,b,d,e,h,j,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME241 | Engineering Physics | 2,4 | a,c,f,h,j,l | 3 | 1 | 3 | 5 | 40 | 60 | 100 |
| 19BEBME242 | Electronic Devices And Circuits | 1,2,3,4, | a,b,e,h,j,k | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| TOTAL | | | | 14 | 3 | 7 | 20 | 200 | 300 | 500 |

| SUB. CODE | TITLE OF THE COURSE | Sub. Area | PO | PE O | L | T | P | C | CI A | ES E | TOTAL | CONTACT HOURS / WEEK |
|-------------------------------------|--|-----------|----------------|----------|-----------|----------|-----------|-----------|------------|------------|------------|----------------------|
| SEMESTER III | | | | | | | | | | | | |
| THEORY | | | | | | | | | | | | |
| 19BEBME301 A/ 19BEBME301 B | Optimization and Calculus of Variables /Linear Algebra and Special Functions | BS | a,b,c,d ,f,g,j | i,ii, iv | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 5 |
| 19BECC302 | Digital electronics | PCH | a,b,d ,f,j | i,ii, iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME303 | C++ and Data Structures | ESC | a,b,c,d ,f,g,j | i,ii, iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME304 | Medical Physics | PCS | a,b,c,d ,f,g, | i,ii, iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME305 | Fundamentals of Biochemistry | PCS | a,b,c,d ,f,g,j | i,ii, iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME306 | Anatomy and Human Physiology | PCS | a,b,c,d ,f,g,j | i,ii, | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| PRACTICALS | | | | | | | | | | | | |
| 19BEBME311 | Bio Chemistry & Human Physiology Laboratory | PCS | h,I,j,l | i,ii | 0 | 0 | 4 | 2 | 40 | 60 | 100 | 3 |
| 19BEBME312 | Digital Electronics Laboratory | PC H | h,I,j,l | i,ii | 0 | 0 | 4 | 2 | 40 | 60 | 100 | 3 |
| 19BEBME313 | Course Oriented project-I | PC | h,I,j,l, n | i,ii | 0 | 0 | 2 | 1 | 100 | - | 100 | 2 |
| | TOTAL | | | | 18 | 1 | 10 | 24 | 420 | 480 | 900 | 28 |
| VALUE ADDED COURSE | | | | | | | | | | | | |
| 19BEBME351 | Soft skills for Bio-Medical Entrepreneurs | M C | | | 1 | 0 | 0 | - | 100 | 0 | 100 | 1 |
| TOTAL CONTACT HOURS PER WEEK | | 29 | | | | | | | | | | |

| SUB. CODE | TITLE OF THE COURSE | Sub. Area | PO | PE O | L | T | P | C | CI A | ES E | TOTAL | CONTACT HOURS / WEEK |
|-------------------------------------|---|-----------|-------------|-------------|-----------|----------|----------|-----------|------------|------------|------------|----------------------|
| SEMESTER IV | | | | | | | | | | | | |
| THEORY | | | | | | | | | | | | |
| 19BEBME401 | Probability and Statistics | BS | a,b,d,j | i,ii,iv | 3 | 1 | 0 | 4 | 40 | 60 | 100 | 4 |
| 19BEBME402 | Linear Integrated Circuits | PCH | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME403 | Biosensors and Transducers | PCH | a,b,c,d,g,j | i,ii,iii,iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME404 | Microprocessor and Microcontroller | PCH | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME405 | Environmental science and Engineering | ESC | a,b,c,d,g,j | i,ii,iii,iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME406 | Analog & Digital Communication | PCH | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| PRACTICALS | | | | | | | | | | | | |
| 19BEBME411 | Microprocessor and Microcontroller Laboratory | PCH | h,I,j,l | i,ii | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEBME412 | Biosensors and Transducers Lab | PCH | h,I,j,l | i,ii | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| | TOTAL | | | | 18 | 2 | 9 | 23 | 320 | 480 | 800 | 25 |
| VALUE ADDED COURSE | | | | | | | | | | | | |
| 19BEBME451 | Hands on training in Biomedical equipments | MC | h,I,j,l | i,ii | 0 | 0 | 1 | - | 100 | 0 | 100 | 1 |
| TOTAL CONTACT HOURS PER WEEK | | 26 | | | | | | | | | | |

| SUB. CODE | TITLE OF THE COURSE | Sub. Area | PO | PEO | L | T | P | C | CA | EE | TOTAL | CONTACT HOURS / WEEK |
|-------------------------------------|--|-----------|-------------|-------------|-----------|----------|----------|-----------|------------|------------|------------|----------------------|
| SEMESTER V | | | | | | | | | | | | |
| THEORY | | | | | | | | | | | | |
| 19BEBME501 | Bio Control System | PC H | a,b,c,d,g,j | i,ii,iii | 3 | 1 | 0 | 3 | 40 | 60 | 100 | 5 |
| 19BEBME502 | Biomedical Instrumentation | PC H | a,b,c,d,g,j | i,ii,iii,iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME503 | Biomedical Signal Processing | PC H | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BECC504 | Professional Ethics, Principles of Management and Entrepreneurship development | HS | j,h,g,k | i, iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME5E-- | Professional Elective I | PE | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME5E-- | Professional Elective II | PE | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| PRACTICALS | | | | | | | | | | | | |
| 19BEBME511 | Biomedical Instrumentation & Signal Processing Lab | PC H | h,I,j,l | i,ii | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEBME512 | Course Oriented project-II | PC H | h,I,j,l,n | i,ii | 0 | 0 | 3 | 1 | 40 | 60 | 100 | 3 |
| | TOTAL | | | | 18 | 1 | 6 | 21 | 320 | 480 | 800 | 26 |
| VALUE ADDED COURSE | | | | | | | | | | | | |
| 19BECC551 | Fundamentals of Marketing for Bio-Medical Entrepreneurs | HS | h,I,j,l | i,ii | 1 | 0 | 0 | - | 100 | 0 | 100 | 1 |
| TOTAL CONTACT HOURS PER WEEK | | 27 | | | | | | | | | | |

| SUB. CODE | TITLE OF THE COURSE | Sub. Area | PO | PEO | L | T | P | C | CIA | ESE | TOTAL | CONTACT HOURS / WEEK |
|-------------------------------------|---|-----------|---------------|---------------------|-----------|----------|----------|-----------|------------|------------|------------|----------------------|
| SEMESTER VI | | | | | | | | | | | | |
| THEORY | | | | | | | | | | | | |
| 19BEBME601 | Bio-Medical Image processing | PCH | a,b,c,d,g,j,m | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME602 | Biomechanics | PCH | a,b,c,d,g,j | i,ii, iii, iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME603 | Diagnostic and Therapeutic Equipment – I&II | PCH | a,b,c,d,g,j,m | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BECC604 | Healthcare and Hospital Management | PCS | a,b,c,d,g,j | i,ii, iii, iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME6E-- | Professional Elective-III | PE | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME6E-- | Professional Elective-IV | PE | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| PRACTICALS | | | | | | | | | | | | |
| 19BEBME611 | Bio-Medical Image processing Lab | PCH | h,I,j,l,m | i,ii | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEBME612 | Diagnostic and Therapeutic Equipments Lab | PCH | h,I,j,l,m | i,ii | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| | TOTAL | | | | 18 | 0 | 6 | 22 | 320 | 480 | 800 | 24 |
| VALUE ADDED COURSE | | | | | | | | | | | | |
| 19BEBME651 | Mini Project | MC | h,I,j,l,n | i,ii | 0 | 0 | 1 | - | 100 | 0 | 100 | 1 |
| 19BEBME652 | Problem solving and Python Programming | MC | h,I,j,l | i,ii | 0 | 0 | 1 | - | 100 | 0 | 100 | 1 |
| TOTAL CONTACT HOURS PER WEEK | | 26 | | | | | | | | | | |

| SUB. CODE | TITLE OF THE COURSE | Sub. Area | PO | PEO | L | T | P | C | CIA | ESE | TOTAL | CONTACT HOURS / WEEK |
|------------------------------|------------------------------------|-----------|---------------|-------------|----|---|----|----|-----|-----|-------|----------------------|
| SEMESTER VII | | | | | | | | | | | | |
| THEORY | | | | | | | | | | | | |
| 19BEBME701 | Virtual Bioinstrumentation | PCH | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME702 | Rehabilitation engineering | PC H | a,b,c,d,g,j | i,ii,iii,iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19____OE__ | Open Elective-1 | OE | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19____OE__ | Open Elective-2 | OE | a,b,c,d,g,j | i,ii,iii,iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME7E__ | Professional Elective-V | PE | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| PRACTICALS | | | | | | | | | | | | |
| 19BEBME711 | Virtual Bioinstrumentation Lab | PC | h,I,j,l | i,ii | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEBME712 | Hospital Training | PC | h,I,j,l | i,ii | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 3 |
| 19BEBME791 | Project Work Phase I | PW | h,I,j,l,n | i,ii | 0 | 0 | 8 | 4 | 40 | 60 | 100 | 8 |
| TOTAL | | | | | 15 | 0 | 14 | 23 | 320 | 480 | 800 | 29 |
| TOTAL CONTACT HOURS PER WEEK | | | 29 | | | | | | | | | |
| SUB. CODE | TITLE OF THE COURSE | Sub. Area | PO | PEO | L | T | P | C | CIA | ESE | TOTAL | CONTACT HOURS / WEEK |
| SEMESTER VIII | | | | | | | | | | | | |
| THEORY | | | | | | | | | | | | |
| 19BEBME801 | Artificial organs and Implants | PCH | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME8E_ | Professional Elective-VI | PE | a,b,c,d,g,j | i,ii,iii,iv | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| 19BEBME8E__ | Professional Elective-VII | PE | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3 |
| PRACTICALS | | | | | | | | | | | | |
| 19BEBME891 | Project Work Phase II and VivaVoce | PW | a,b,c,d,g,j,n | i,ii,iii,iv | 0 | 0 | 32 | 16 | 120 | 180 | 300 | 32 |
| TOTAL | | | | | 9 | 0 | 32 | 25 | 240 | 360 | 600 | 41 |
| TOTAL CONTACT HOURS PER WEEK | | | 41 | | | | | | | | | |

LIST OF ELECTIVES
PROFESSIONAL ELECTIVES

SEMESTER V

Elective I & II

| SUB. CODE | TITLE OF THE COURSE | PO | PEO | L | T | P | C | CIA | ESE | TOTAL |
|-------------|---------------------|-------------|--------------|---|---|---|---|-----|-----|-------|
| 19BEBME5E01 | Ergonomics | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME5E02 | Biometric Systems | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME5E03 | Medical Optics | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME5E04 | Biomaterials | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME5E05 | Internet of things | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

SEMESTER VI

Elective III & IV

| SUB. CODE | TITLE OF THE COURSE | PO | PEO | L | T | P | C | CIA | ESE | TOTAL |
|-------------|----------------------------------|-------------|--------------|---|---|---|---|-----|-----|-------|
| 19BEBME6E01 | Physiological Modelling | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME6E02 | Telehealth Technology | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME6E03 | Cancer Biology | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME6E04 | Bio signal Conditioning Circuits | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME6E05 | Hospital waste management | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

SEMESTER VII

Elective V

| SUB. CODE | TITLE OF THE COURSE | PO | PEO | L | T | P | C | CIA | ESE | TOTAL |
|-------------|-------------------------------------|-------------|--------------|---|---|---|---|-----|-----|-------|
| 19BEBME7E01 | Neural engineering | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME7E02 | Lasers and Fiber Optics in Medicine | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME7E03 | Patient and Devices Safety | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME7E04 | Radiological equipments | a,b,c,d,g,j | i,ii, iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

SEMESTER VIII Elective VI & VII

| SUB. CODE | TITLE OF THE COURSE | PO | PEO | L | T | P | C | CIA | ESE | TOTAL |
|-------------|--|-------------|----------|---|---|---|---|-----|-----|-------|
| 19BEBME8E01 | Biological Spectroscopy | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E02 | Robotics in medicine | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E03 | Nanotechnology in Medicine | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E04 | Virtual Reality and Augmented Reality | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E05 | Speech Processing | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E06 | Rapid Prototyping | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E07 | Bio MEMS | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E08 | Intellectual Property Rights | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E09 | Artificial Intelligence and Expert Systems | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME8E10 | Neural Networks and Applications | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

**OPEN ELECTIVES
SEMESTER VII & SEMESTER VIII**

| SUB. CODE | TITLE OF THE COURSE | PO | PEO | L | T | P | C | CIA | ESE | TOTAL |
|-------------------------------|--------------------------------|-------------|----------|---|---|---|---|-----|-----|-------|
| SCIENCE AND HUMANITIES | | | | | | | | | | |
| 19BESH0E01 | Probability and Random Process | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E02 | Fuzzy Mathematics | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E03 | Linear Algebra | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E04 | Engineering Acoustics | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E05 | Solid Waste Management | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E06 | Green Chemistry | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E07 | Applied Electrochemistry | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E08 | Industrial | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--|---------------------------------------|-------------|----------|---|---|---|---|----|----|-----|
| | Chemistry | | | | | | | | | |
| 19BESH0E09 | English for Technocrats | a,b,c,d,g,j | i,ii,iii | 1 | 4 | 0 | 3 | 40 | 60 | 100 |
| COMPUTER SCIENCE AND ENGINEERING | | | | | | | | | | |
| 19BEC0E01 | Internet Programming | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E02 | Multimedia and Animation | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E03 | PC hardware and Troubleshooting | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E04 | Java Programming | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRICAL AND ELECTRONICS ENGINEERING | | | | | | | | | | |
| 19BEE0E01 | Electric Hybrid Vehicles | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE0E02 | Energy Management and Energy Auditing | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE0E03 | Programmable Logic Controller | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE0E04 | Renewable Energy Resources | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRONICS AND COMMUNICATION ENGINEERING | | | | | | | | | | |
| 19BEE0E01 | Real Time Embedded Systems | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE0E02 | Consumer Electronics | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE0E03 | Neural Networks and its Applications | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE0E04 | Fuzzy Logic and its Applications | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOTECHNOLOGY | | | | | | | | | | |
| 19BTB0E01 | Bioreactor Design | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTB0E02 | Food Processing | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-------------------------------|---|-------------|----------|---|---|---|---|----|----|-----|
| | and Preservation | | | | | | | | | |
| 19BTBTOE03 | Basic Bioinformatics | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nano Biotechnology | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| MECHANICAL ENGINEERING | | | | | | | | | | |
| 19BEME0E01 | Computer Aided design | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E02 | Industrial safety and Environment | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E03 | Transport Phenomena | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E04 | Introduction to Bio mechanics | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| AUTOMOBILE ENGINEERING | | | | | | | | | | |
| 19BEAEOE01 | Automobile Engineering | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Basics of Two and Three Wheelers | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Automobile Maintenance | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Introduction to Modern Vehicle Technology | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CIVIL ENGINEERING | | | | | | | | | | |
| 19BECEO01 | Housing, Plan and Management | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEO02 | Building Services | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEO03 | Management of irrigation systems | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEO04 | Advanced construction technology | a,b,c,d,g,j | i,ii,iii | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Note:

- **Blue Font** represents Employability Courses
- **Green Font** represents Entrepreneurship Courses
- **Red Font** Represents Skill Development Courses

B.E - BIOMEDICAL ENGINEERING

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

- i. To design, implement and analyze the emerging discipline of biomedical engineering to address the healthcare challenges and opportunities.
- ii. To develop a biomedical engineer with an adequate technical and soft skills to solve the complex problems in the field of biomedical industry, Health care industry, Biomedical Research, medicine, academia, and consulting.
- iii. To build and lead cross-functional biomedical equipments upholding the professional responsibilities & ethical values.
- iv. Engage in continuing education and life-long learning to be competitive and enterprising.

PROGRAMME OUTCOME (PO)

- a. Apply knowledge of mathematics, basic sciences, engineering fundamentals and specialization to solve Health care problems
- b. Identify , design, formulate analyze & interpret data
- c. Design an integrated system with due considerations to public health, safely , societal and environment
- d. Investigate , formulate and solve Health care industry problems
- e. Acquire skills to use modern engineering tools and software to solve complex engineering problems
- f. Apply societal and cultural issues in professional engineering practice.
- g. Understand the impact of engineering solutions in global and societal context
- h. Function as a member of multidisciplinary team
- i. Communicate effectively both orally and in writing
- j. Recognize the need for ability to engage in lifelong learning
- k. Understand the project management and finance
- l. Acquire knowledge to design, develop, predict and model a biomedical system with professional responsibility

PROGRAMME SPECIFIC OUTCOMES (PSOs)

- m) To continuous update knowledge in the field of Diagnostic and Therapeutic Equipments and Bio-imaging techniques
- n) To develop biomedical entrepreneurs with innovative products useful to our country

PEO – PO MAPPING

| PEO/PO | a | b | c | d | e | f | g | h | i | j | k | l |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|
| i | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | | |
| ii | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | |
| iii | | | | ✓ | | | | | ✓ | | ✓ | |
| iv | | ✓ | | ✓ | | | | | ✓ | | ✓ | ✓ |

PEO – PSO MAPPING

| PEO/PSO | m | n |
|---------|---|---|
| i | ✓ | ✓ |
| ii | | ✓ |
| iii | ✓ | |
| iv | | ✓ |



KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act 1956)

FACULTY OF ENGINEERING

B.E (CIVIL ENGINEERING)

COURSE OF STUDY AND SCHEME OF EXAMINATION

(2019 BATCH ONWARDS)

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

PO-1 Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2 Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3 Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO-4 Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5 Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO-6 The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7 Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9 Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO-11 Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO-12 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSO)

The B.E. Degree Programme in Civil Engineering is offered in the department with the following programme specific COURSE OUTCOMES(COs):

PSO-13 The Graduates of this Programme with proficiency in mathematics and physical sciences will excel in the core areas of civil engineering such as structural, environmental and water resources engineering.

PSO-14 Utilize principles, methods, software's and codes of practices to excel in the areas of planning, analysis and designs related to Civil Engineering systems.

PSO-15 Prepare detailed drawings, cost estimates, reports, walk through views, interact with clients, manage workers, work in a team and executes construction works.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The Civil Engineering education at KAHE, Coimbatore, mainly based on practical oriented learning. The courses offered are focused on training the students to make them adaptable to any type of role in different fields of Civil Engineering.

The B.E. Degree Programme in Civil Engineering is offered in the department with the following educational objectives:

PEO-1 To equip the graduates with sufficient knowledge and experience to become leaders in industry and academia

PEO-2 To offer platform for research and development

PEO-3 To impart professional ethics with a commitment to the society and environment

PEO-PO mapping

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| PEO1 | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | | ✓ | ✓ |
| PEO2 | ✓ | ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| PEO3 | | | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |

PEO-PSO mapping

| | PSO1 | PSO2 | PSO3 |
|------|------|------|------|
| PEO1 | ✓ | ✓ | ✓ |
| PEO2 | ✓ | ✓ | ✓ |
| PEO3 | | ✓ | ✓ |

SEMESTER I

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|--------------|--|-----------------------|----|------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BECE101 | Mathematics-I (Calculus, Multivariable Calculus & Linear Algebra) | 1 | 1 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BECE141 | Chemistry-I | 1 | 1 | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| 19BECE142 | Basic Electrical Engineering | 1 | 1 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BECE111 | Engineering Graphics & Design | 1 | 1 | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 10 | 3 | 9 | 18 | 160 | 240 | 400 |

SEMESTER II

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|--------------|---|-----------------------|----|------------------------|---|----|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BECE201 | Mathematics-II (Differential Equations) | 1 | 11 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BECE241 | Mechanics and Mechanics of Solids | 1,2 | 3 | 3 | 1 | 3 | 5 | 40 | 60 | 100 |
| 19BECE242 | English | 1 | 10 | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BECE243 | Programming For Problem Solving | 1 | 2 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECE211 | Workshop / Manufacturing Practices Laboratory | 1 | 1 | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 12 | 2 | 13 | 20 | 200 | 300 | 500 |

SEMESTER III

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|-------------|--|-----------------------|----|------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| 19BECE301 | Mathematics-III (Transform & Discrete) | 1 | 1 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--------------|--|---|----------|----|---|---|----|-----|-----|-----|
| | Mathematics) | | | | | | | | | |
| 19BECE302 | Biology for Engineers | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE303 | Energy Science & Engineering | 1 | 1 | 1 | 1 | 0 | 2 | 40 | 60 | 100 |
| 19BECE304 | Introduction to Civil Engineering | 1 | 1 | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BECE305 | Engineering Mechanics | 1 | 1 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BECE306 | Effective Technical Communication | 1 | 10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE341 | Basic Electronics | 1 | 1 | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BECE311 | Computer-aided Civil Engineering Drawing | 1 | 4,5,9,10 | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| TOTAL | | | | 18 | 3 | 4 | 23 | 320 | 480 | 800 |

SEMESTER IV

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|-------------|--|-----------------------|-----|------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| 19BECE401 | Introduction to Mechanical Engineering | 1 | 1 | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BECE402 | Engineering Geology | 1,2 | 2 | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BECE403 | Disaster Preparedness & Planning Management | 1,2 | 1,4 | 1 | 1 | 0 | 2 | 40 | 60 | 100 |
| 19BECE404 | Introduction to Solid Mechanics | 1 | 3 | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BECE441 | Instrumentation & Sensor Technologies for Civil Engineering Applications | 1,2 | 1,4 | 1 | 1 | 2 | 3 | 40 | 60 | 100 |
| 19BECE442 | Introduction to Fluid Mechanics | 1 | 3 | 2 | 0 | 2 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--------------|--|-----|-----|----|---|---|----|-----|-----|-----|
| 19BECE443 | Surveying & Geomatics | 1 | 6 | 1 | 1 | 2 | 3 | 40 | 60 | 100 |
| 19BECE444 | Materials, Testing & Evaluation | 1,2 | 4,9 | 2 | 0 | 3 | 4 | 40 | 60 | 100 |
| 19BECE451 | Civil Engineering - Societal & Global Impact | 1,3 | 8 | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| TOTAL | | | | 15 | 4 | 9 | 24 | 360 | 540 | 900 |

SEMESTER V

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|--------------|---|-----------------------|-----|------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| 19BECE501 | Mechanics of Materials | 1 | 3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE502 | Structural Engineering | 1,2 | 2 | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BECE503 | Hydrology & Water Resources Engineering | 1,3 | 7 | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BECE504 | Environmental Engineering | 1,3 | 7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE505 | Transportation Engineering | 1,3 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE506 | Professional Practice, Law & Ethics | 3 | 8 | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19BECE541 | Hydraulic Engineering | 1 | 3 | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BECE542 | Geotechnical Engineering | 1,2 | 2,3 | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 19 | 2 | 4 | 23 | 320 | 480 | 800 |

SEMESTER VI

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|--------------|---|-----------------------|------|------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| 19BECE601 | Construction Engineering & Management | 1 | 9,11 | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BECE641 | Engineering Economics, Estimation & Costing | 1 | 11 | 2 | 1 | 4 | 5 | 40 | 60 | 100 |
| 19BECE6E-- | Elective-I | 1 | 6,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE6E-- | Elective-II | 1 | 6,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE6E-- | Elective-III | 1 | 6,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE6E-- | Elective-IV | 1 | 6,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 16 | 2 | 4 | 20 | 240 | 360 | 600 |

SEMESTER VII

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|--------------|--|-----------------------|----------|------------------------|---|----|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| 19BECE7E-- | Elective V | 1 | 6,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE7E-- | Elective-VI | 1 | 6,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | Open Elective-I (Metro System and Engineering) | 1 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | Open Elective-II | 1 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE791 | Project Work-1 | 1,2,3 | 4,5,9,11 | 0 | 0 | 12 | 6 | 80 | 120 | 200 |
| TOTAL | | | | 12 | 0 | 12 | 18 | 240 | 360 | 600 |

SEMESTER VIII

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|--------------------------------|--|-----------------------|----------|------------------------|---|----|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| 19BECE8E-- | Elective VII | 1 | 6,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE8E-- | Elective VIII | 1 | 6,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | Open Elective-III | 1 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | Open Elective-IV | 1 | 6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECE891 | Project Work-2 (Continued from VI I Semester) | 1,2,3 | 4,5,9,11 | 0 | 0 | 12 | 6 | 80 | 120 | 200 |
| TOTAL | | | | 12 | 0 | 12 | 18 | 240 | 360 | 600 |
| TOTAL NO OF CREDITS=164 | | | | | | | | | | |

L: Lecture Hour T: Tutorial Hour CIA: Continuous Internal Assessment

P: Practical Hour C: Credit ESE: End semester Examination

LIST OF ELECTIVES

PROFESSIONAL ELECTIVES (PE)

The Professional Elective Courses (PEC-CE) are shown indifferent tracks

| Track | Professional Electives |
|-------|---------------------------------------|
| I | Structural Engineering |
| II | Geotechnical Engineering |
| III | Environmental Engineering |
| IV | Construction Engineering & Management |

STRUCTURAL ENGINEERING

| Course Code | Course Title | Pre-requisite | PEO | PO | Instruction hours/week | | | Credits | Maximum Marks | | |
|-------------|----------------------------------|---------------|-----|-----------|------------------------|---|---|---------|---------------|-----|-------|
| | | | | | L | T | P | | CIA | ESE | Total |
| 19BECEE01 | Structural Analysis-I | Nil | 1 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE02 | Structural Analysis-II | 19BECEE01 | 1 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE03 | Advanced Structural Analysis | 19BECEE02 | 1 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE04 | Structural Mechanics | 19BECEE03 | 1,2 | 3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE05 | Reinforced Concrete | 19BECEE06 | 1 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE06 | Concrete Technology | Nil | 1 | 2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE07 | Design of Concrete Structures-I | 19BECEE05 | 1 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE08 | Design of Concrete Structures-II | 19BECEE07 | 1 | 2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE09 | Prestressed Concrete | 19BECEE08 | 1,2 | 1,9,12,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE10 | Design of Steel Structures | 19BECEE08 | 1,2 | 1,2,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE11 | Concrete Materials | 19BECEE06 | 1,2 | 2,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

GEOTECHNICAL ENGINEERING

| Course Code | Course Title | Pre-requisite | PEO | PO | Instruction hours/week | | | Credits | Maximum Marks | | |
|-------------|------------------------------|---------------|-----|-------|------------------------|---|---|---------|---------------|-----|-------|
| | | | | | L | T | P | | CIA | ESE | Total |
| 19BECEE12 | Soil Mechanics-I | Nil | 1 | 3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE13 | Soil Mechanics-II | 19BECEE12 | 1 | 3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE14 | Foundation Engineering | 19BECEE13 | 1,2 | 2,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE15 | Environmental Geo-technology | Nil | 1,2 | 2,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

ENVIRONMENTAL ENGINEERING

| Course Code | Course Title | Pre-requisite | PEO | PO | Instruction hours/week | | | Credits | Maximum Marks | | |
|-------------|---|---------------|-----|-----------|------------------------|---|---|---------|---------------|-----|-------|
| | | | | | L | T | P | | CIA | ESE | Total |
| 19BECEE16 | Ecological Engineering | Nil | 1,2 | 3.6.12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE17 | Transport of Water and Wastewater | Nil | 1,2 | 4.7.11.14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE18 | Physico-Chemical Processes for Water and Wastewater Treatment | 19BECEE17 | 1,2 | 7.8.12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE19 | Biological Processes for Contaminant Removal | 19BECEE19 | 1,2 | 1.9.12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE20 | Rural Water Supply and Onsite Sanitation Systems | 19BECEE19 | 1,2 | 4.7.11.14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE21 | Solid and Hazardous Waste Management | Nil | 1,2 | 4.7.11.14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE22 | Air and Noise Pollution and Control | Nil | 1,2 | 3.4.5.7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE23 | Environmental | 19BECEE22 | 1,2 | 4.7.11.14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|--|
| | Impact Assessment and Life Cycle Analyses | | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|--|

CONSTRUCTION ENGINEERING & MANAGEMENT

| Course Code | Course Title | Pre-requisite | PEO | PO | Instruction hours/week | | | Credits | Maximum Marks | | |
|-------------|---|---------------|-----|----------|------------------------|---|---|---------|---------------|-----|-------|
| | | | | | L | T | P | | CIA | ESE | Total |
| 19BECEE24 | Building Construction Practice | 19BECEE11 | 1,2 | 3,4,5,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE25 | Construction Project Planning & Systems | 19BECEE25 | 1,2 | 3,4,5,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE26 | Sustainable Construction Methods | 19BECEE25 | 1,2 | 3,4,5,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE27 | Construction Engineering Materials. | Nil | 1,2 | 3,4,5,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE28 | Contracts Management | 19BECEE25 | 1,2 | 3,4,5,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE29 | Construction Equipment & Automation | 19BECEE25 | 1,2 | 3,4,5,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEE30 | Repairs & Rehabilitation of Structures | 19BECEE25 | 1,2 | 4.5.7.12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

LIST OF OPEN ELECTIVES

COURSES OFFERED BY OTHER DEPARTMENTS

| Course Code | Course Title | PE O | PO | Instruction hours/week | | | Cr edi ts | Maximum Marks | | |
|--------------------------------------|--|---------|----------|---------------------------|---|---|-----------------|---------------|-----|-------|
| | | | | L | T | P | | CIA | ESE | Total |
| SCIENCE AND HUIMANITIES | | | | | | | | | | |
| 19BESH0E01 | Solid Waste Management | 1, 2 | 7,11, 14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E02 | Green Chemistry | 1, 2 | 1,3,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E03 | Applied Electrochemistry | 1, 2 | 1,3,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E04 | Industrial Chemistry | 1, 2 | 1,3,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E05 | Technical Writing | 1 | 9,10, 12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E06 | Geophysics | 1, 2 | 1,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E07 | Engineering Acoustics | 1, 2 | 1,3,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E08 | Industrial Mathematics – I | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E09 | Industrial Mathematics – II | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E10 | Fuzzy Mathematics | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E11 | Mathematical Physics | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E12 | Linear Algebra | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COMPUTER SCIENCE ENGINEERING | | | | | | | | | | |
| 19BEC0E01 | Internet Programming | 1, 2 | 1,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E02 | Multimedia and Animation | 2 | 1,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E03 | PC hardware and Troubleshooting | 2 | 5,6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E04 | Java Programming | 1, 2 | 1,3 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRICAL & ELECTRONICS ENGINEERING | | | | | | | | | | |
| 19BEE0E01 | Electric Hybrid Vehicle | 1, 2 | 1,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE0E02 | Energy Management & Energy Auditing | 1, 2 | 1,6,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE0E03 | Programmable Logic Controller | 1 | 1,4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--|---|------|---------|---|---|---|---|----|----|-----|
| 19BEEEOE04 | Renewable Energy Resources | 1, 2 | 1,6,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRONICS & COMMUNICATION ENGINEERING | | | | | | | | | | |
| 19BEECOE01 | Real Time Embedded Systems | 1, 2 | 1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE02 | Consumer Electronics | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE03 | Neural Networks and its Applications | 1, 2 | 1,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE04 | Fuzzy Logic and its Applications | 1, 2 | 1,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE05 | Principles of Modern Communication System | 1, 2 | 1,6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOTECHNOLOGY | | | | | | | | | | |
| 19BTBTOE01 | Bioreactor design | 1, 2 | 1,3,6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | 1 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nanobiotechnology | 1, 2 | 1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| MECHANICAL ENGINEERING | | | | | | | | | | |
| 19BEMEEOE01 | COMPUTER AIDED DESIGN | 1, 2 | 1,3,4,6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE02 | INDUSTRIAL SAFETY AND ENVIRONMENT | 1, 2 | 1,3,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE03 | TRANSPORT PHENOMENA | 1, 2 | 1,3,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE04 | INTRODUCTION TO BIOMECHANICS | 1 | 1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| AUTOMOBILE ENGINEERING | | | | | | | | | | |
| 19BEAEOE01 | Automobile Engineering | 1 | 1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Basics of Two and Three Wheelers | 1 | 1,5 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Automobile Maintenance | 1 | 1,1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Introduction to Modern Vehicle Technology | 1 | 1,1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE05 | Commercial Fleet Operation | 1 | 1,1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| CHEMICAL ENGINEERING | | | | | | | | | | |
|-------------------------------|---|------|-------------------|---|---|---|---|----|----|-----|
| 19BTCEOEO1 | Energy Management In Chemical Industries | 1, 2 | 1,6,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOEO2 | Fertilizer Technology | 1, 2 | 1,6,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOEO3 | Industrial Wastewater Treatment | 1, 2 | 4,7,1 1,1 4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOEO4 | Solid and Hazardous Waste Management | 1, 2 | 4,7,1 1,1 4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| FOOD TECHNOLOGY | | | | | | | | | | |
| 19BTFTOE01 | Processing of Food Materials | 1, 2 | 1,12, 15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 1, 2 | 1,6,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 1, 2 | 1,6,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 1, 2 | 4,7,1 4 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOMEDICAL ENGINEERING | | | | | | | | | | |
| 19BEBMEOEO 1 | Robotics in medicine | 1,2 | 1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOEO 2 | Virtual Reality and Augmented Reality | 1,2 | 1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOEO 3 | Artificial organs and Implants | 1,2 | 1,2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

COURSES OFFERED TO OTHER DEPARTMENT

| SUB. CODE | TITLE OF THE PAPER | PEO | PO | L | T | P | C | CIA | ESE | TOTAL |
|------------|--|-----|---------|---|---|---|---|-----|-----|-------|
| 19BECEOEO1 | Housing, Plan and Management | 1,2 | 5,9,6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOEO2 | Building Services | 1,2 | 8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOEO3 | Repair and Rehabilitation of Structures | 1,2 | 7,9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOEO4 | Computer Aided Civil Engineering Drawing | 1,2 | 3,4,5,7 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

****-- Skill Development**

****-- Employability**

****--Entrepreneurship**

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University Established Under Section 3 of UGC Act 1956)
Coimbatore – 641 021. INDIA

DEPARTMENT OF CIVIL ENGINEERING

M.E. WATER RESOURCES AND ENVIRONMENTAL ENGINEERING (FULL TIME)
Curriculum Structure
(2019 BATCH ONWARDS)

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- I. To prepare students to excel in research and to succeed in Water resources and Environmental engineering profession through global, rigorous post graduate education
- II. To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve in Water resources and Environmental engineering problems
- III. To train students with good scientific and engineering knowledge so as to comprehend, analyze, design, and create novel products and solutions for the real-life problems
- IV. To inculcate students in professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate in Water resources and Environmental engineering issues to broader social context.
- V. To provide student with an academic environment aware of excellence, leadership, written ethical codes and guidelines, and the life-long learning needed for a successful professional career

PROGRAMME OUTCOMES (POs):

On successful completion of the programme,

- a. Graduates will demonstrate knowledge of mathematics, science and engineering.
- b. Graduates will demonstrate an ability to design a system, component or process as per needs and specifications.
- c. Graduates will demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks.
- d. Graduate will demonstrate skills to use modern engineering tools, software and equipment to analyze problems.
- e. Graduates will demonstrate knowledge of professional and ethical responsibilities.
- f. Graduate will be able to communicate effectively in both verbal and written form.
- g. Graduate will develop confidence for self education and ability for life-long learning.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

- h. Graduates will demonstrate an ability to identify, formulate and solve engineering problems.
- i. Graduate will demonstrate an ability to design and conduct experiments, analyze and interpret data.
- j. Graduate will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.

MAPPING:

| PEOs | a | b | c | d | e | f | g | h | i | j |
|------|---|---|---|---|---|---|---|---|---|---|
| I | √ | | | √ | | | √ | √ | √ | |
| II | | √ | | | √ | | | | √ | √ |
| III | | | √ | | √ | √ | | √ | √ | |
| IV | √ | | | √ | | | √ | | | √ |
| V | | √ | √ | | | √ | | | √ | √ |

DEPARTMENT OF CIVIL ENGINEERING
M.E. WATER RESOURCES AND ENVIRONMENTAL ENGINEERING (FULL TIME)
COURSE OF STUDY AND SCHEME OF EXAMINATIONS
(2019 BATCH ONWARDS)

| COURSE CODE | NAME OF THE COURSE | CATEGORY | OBJECTIVES AND OUT COMES | | INSTRUCTION HOURS /WEEK | | | CREDITS | MAXIMUM MARKS | | | PAGE NUMBER |
|----------------|--|----------|--------------------------------|-------------|-------------------------------|---|---|---------|---------------|-----|-------|----------------|
| | | | PEO's | PO's | L | T | P | | CIA | ESE | TOTAL | |
| | | | | | | | | | 40 | 60 | 100 | |
| SEMESTER – I | | | | | | | | | | | | |
| 19MEWE101 | Surface Water Hydrology | PC | I, II | a,b,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 23 |
| 19MEWE102 | Air pollution and control | PC | I, II | a,c,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 25 |
| 19MEWE103 | Research Methodology and IPR | PC | III | c,d,i | 2 | 0 | 0 | 2 | 40 | 60 | 100 | 27 |
| 19MEWE1E0 | 1. Industrial Wastewater Pollution – Prevention and Control | PE | I, III | a,b,j | | | | | | | | 29 |
| | 2. Soil Pollution Engineering | | I, III | d,f,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 31 |
| | 3. Design of Biological Treatment Systems | | I, IV | e,f,i | | | | | | | | 33 |
| | 4. Climate change and Adaptation | | I, II, V | a,b,g | | | | | | | | 35 |
| 19MEWE1E0 | 5. Water Supply Distribution and Buried Pipelines | PE | I, III | a,b,d, h | | | | | | | | 36 |
| | 6. Ground Water and Drainage Engineering | | I, III | c,d,f, i | | | | | | | | 37 |
| | 7. Rural Water Supply and On-Site Sanitation | | I, IV | e,f,g, j | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 38 |
| | 8. Advanced Ground Water Hydrology | | I, II, V | a,b,g, i | | | | | | | | 39 |
| | 9. River Engineering | | III, V | a,d,f | | | | | | | | 40 |
| | 10. Probability and statistical methods | | II, V | a,f,h, i | | | | | | | | 41 |
| 19MEWE111 | Environmental Engineering lab | CL | III | c,d,i | 0 | 0 | 2 | 2 | 40 | 60 | 100 | 42 |
| 19MEWE112 | Geotechnical engineering lab | CL | III | c,d,i | 0 | 0 | 2 | 2 | 40 | 60 | 100 | 43 |
| | Total | | | | 14 | 0 | 4 | 18 | 280 | 420 | 700 | |
| SEMESTER – II | | | | | | | | | | | | |
| 19MEWE201 | Design of Hydraulic | PC | I, II | a,b,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 44 |

| | | | | | | | | | | | | |
|-----------------------|---|----|----------|----------------------|-----------|----------|----------|-----------|------------|------------|------------|----|
| | and Environmental Engineering Structures | | | | | | | | | | | |
| 19MEWE202 | Environmental Geo-technology | PC | I, II | a,b,c, i | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 45 |
| 19MEWE2E0 | 1. Environmental Impact Assessment of Water Resources Development | PE | I, III | a,b,d, j | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 46 |
| | 2. Environmental Quality Monitoring | | I, III | c,d,f, j | | | | | | | | 47 |
| | 3. Environment, Health and Safety in Industries | | I, IV | e,f,g, h | | | | | | | | 48 |
| | 4. Environmental Hydraulics | | I, II, V | a,b,g, i | | | | | | | | 50 |
| 19MEWE2E0 | 5. Solid and Hazardous waste management | PE | I, III | a,b,d, h | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 51 |
| | 6. Groundwater Modeling and Management | | I, III | c,d,f, h | | | | | | | | 53 |
| | 7. Landfill Engineering and Remediation Technology | | I, IV | e,f,g, i | | | | | | | | 55 |
| | 8. Air and Water Quality Modeling | | I, II, V | a,b,g, j | | | | | | | | 57 |
| | 9. Flood and Drought Management | | III, V | a,d,f | | | | | | | | 58 |
| 19MEWE211 | Geographical Information system lab | CL | III | c,d,i | 0 | 0 | 2 | 2 | 40 | 60 | 100 | 59 |
| 19MEWE212 | Numerical Analysis Lab | PC | III | c,d,i | 0 | 0 | 2 | 2 | 40 | 60 | 100 | 60 |
| 19MEWE213 | Mini Project | CL | III | c,d,j | 0 | 0 | 4 | 2 | 40 | 60 | 100* | 61 |
| Total | | | | | 12 | 0 | 8 | 18 | 280 | 420 | 700 | |
| SEMESTER – III | | | | | | | | | | | | |
| 19MEWE3E0 | 1. Rehabilitation and Modernisation of Irrigation Systems | PE | I, III | a,b,d, i | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 62 |
| | 2. Watershed Conservation and Management | | I, III | c,d,f, h,j | | | | | | | | 63 |
| | 3. Urban Water Resources Management | | I, IV | e,f,g, I,j | | | | | | | | 64 |
| | 4. Water Power and Dam Engineering | | I, II, V | | | | | | | | | 66 |
| | 5. Coastal Engineering | | III, V | a,b,,h g a,d,f | | | | | | | | 67 |

| | | | | | | | | | | | | |
|----------------------|--|----|--|---|----------|----------|-----------|-----------|------------|------------|------------|----|
| 19MEWEOEO | 1. Business Analytics | OE | I, III I, III I, IV I, II, V III, V II, V | a,b, c,d,f e,f,g, i a,b,j a,d,f a,f,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 68 |
| | 2. Industrial Safety | | | | | | | | | | | 70 |
| | 3. Operations Research | | | | | | | | | | | 72 |
| | 4. Cost Management of Engineering Projects | | | | | | | | | | | 73 |
| | 5. Composite Materials | | | | | | | | | | | 74 |
| | 6. Waste to Energy | | III, IV | b,e,i | | | | | | | | 75 |
| | 7. Remote Sensing and GIS Applications in Environmental Management | | | | | | | | | | | 76 |
| | 8. Resource and Energy Recovery from Waste | | | | | | | | | | | 78 |
| 19MEWE391 | Project Work – Phase I | PW | III | c,d,i | 0 | 0 | 20 | 10 | 40 | 60 | 100 | 80 |
| Total | | | | | 6 | 0 | 20 | 16 | 120 | 180 | 300 | |
| SEMESTER – IV | | | | | | | | | | | | |
| 19MEWE491 | Project Work – Phase II | PW | III | c,d,i | 0 | 0 | 32 | 16 | 120 | 180 | 300 | 81 |
| Total | | | | | 0 | 0 | 32 | 16 | 120 | 180 | 300 | |

L-Lecture T-Tutorial P-Practical C-Credit

CIA – Continuous Internal Assessment

ESE – End semester Examination

Total credits = 68

Total Marks = 2000

*** To be evaluated internally by a committee of members**

Review 1& 2

– 60 marks

Final presentation and viva voce

– 40 marks



KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act 1956)

Coimbatore – 641 021. INDIA

FACULTY OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

M.E. WATER RESOURCES AND ENVIRONMENTAL ENGINEERING (PART TIME)

Curriculum Structure
(2019 BATCH ONWARDS)

PROGRAMME EDUCATIONAL COURSE OBJECTIVES (PEOs) :

- I. To prepare students to excel in research and to succeed in Water resources and Environmental engineering profession through global, rigorous post graduate education
- II. To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve in Water resources and Environmental engineering problems
- III. To train students with good scientific and engineering knowledge so as to comprehend, analyze, design, and create novel products and solutions for the real life problems
- IV. To inculcate students in professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate in Water resources and Environmental engineering issues to broader social context.
- V. To provide student with an academic environment aware of excellence, leadership, written ethical codes and guidelines, and the life-long learning needed for a successful professional career

PROGRAMME OUTCOMES (POs):

On successful completion of the programme,

- a. Graduates will demonstrate knowledge of mathematics, science and engineering.
- b. Graduates will demonstrate an ability to design a system, component or process as per needs and specifications.
- c. Graduates will demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks.
- d. Graduate will demonstrate skills to use modern engineering tools, software and equipment to analyze problems.
- e. Graduates will demonstrate knowledge of professional and ethical responsibilities.
- f. Graduate will be able to communicate effectively in both verbal and written form.

- g. Graduate will develop confidence for self education and ability for life-long learning.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

- h. Graduates will demonstrate an ability to identify, formulate and solve engineering problems.
- i. Graduate will demonstrate an ability to design and conduct experiments, analyze and interpret data.
- j. Graduate will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.

MAPPING:

| PEOs | a | b | c | d | e | f | g | h | i | j |
|------|---|---|---|---|---|---|---|---|---|---|
| I | √ | | | √ | | | √ | √ | √ | |
| II | | √ | | | √ | | | | √ | √ |
| III | | | √ | | √ | √ | | √ | √ | |
| IV | √ | | | √ | | | √ | | | √ |
| V | | √ | √ | | | √ | | | √ | √ |

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University Established Under Section 3 of UGC Act 1956)

Coimbatore – 641 021, INDIA

DEPARTMENT OF CIVIL ENGINEERING

M.E. WATER RESOURCES AND ENVIRONMENTAL ENGINEERING (PART TIME)

COURSE OF STUDY AND SCHEME OF EXAMINATIONS

(2019 BATCH ONWARDS)

| COURSE CODE | NAME OF THE COURSE | COURSE OBJECTIVES AND OUT COMES | | INSTRUCTI ON HOURS /WEEK | | | CREDITS | MAXIMUM MARKS | | |
|---------------|--|---------------------------------|---------|--------------------------|---|---|---------|---------------|-----|-------|
| | | | | | | | | | | |
| | | PEO's | PO's | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19PMEWE101 | Surface Water Hydrology | I,II | a,b,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PMEWE102 | Probability and statistical methods | I,II | a,b,c,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PMEWE1E0 | 1. Industrial Wastewater Pollution – Prevention And Control | I,III | a,b,d,j | | | | | | | |
| | 2. Soil Pollution Engineering | I,III | c,d,f,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | 3. Design Of Biological Treatment Systems | I,IV | e,f,g,j | | | | | | | |
| | 4. Climate change and Adaptation | I,II,V | a,b,g | | | | | | | |
| 19PMEWE111 | Environmental Engineering lab | III | c,d,i | 0 | 0 | 2 | 2 | 40 | 60 | 100 |
| Total | | | | 9 | 0 | 2 | 11 | 160 | 240 | 400 |
| SEMESTER – II | | | | | | | | | | |
| 19PMEWE201 | Design of Hydraulic and Environmental Engineering Structures | I,II | a,b,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PMEWE202 | Air pollution and control | I,II | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PMEWE2E0 | 1. Water Supply Distribution And Buried Pipelines | I,III | a,b,d,i | | | | | | | |
| | 2. Ground Water and Drainage Engineering | I,III | c,d,f,j | | | | | | | |
| | 3. Rural Water Supply And On Site Sanitation | I,IV | e,f,g,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | 4. Remote Sensing and GIS Applications in Environmental Management | I,II,V | a,b,g,h | | | | | | | |
| | 5. River Engineering | III,V | a,d,f | | | | | | | |

| | | | | | | | | | | |
|-----------------------|---|--------|-----------|----------|----------|----------|-----------|------------|------------|------------|
| 19PMEWE211 | Geotechnical engineering lab | III | c,d,i | 0 | 0 | 2 | 2 | 40 | 60 | 100 |
| Total | | | | 9 | 0 | 2 | 11 | 160 | 240 | 400 |
| SEMESTER – III | | | | | | | | | | |
| 19PMEWE301 | Environmental Geo-technology | I,II | a,b,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PMEWE302 | Research Methodology and IPR | I,II | a,b,c,h | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19PMEWE3E0 | 1. Environmental Impact Assessment of Water Resources Development | I,III | a,b,d,h,i | | | | | | | |
| | 2. Environmental Quality Monitoring | I,III | c,d,f,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | 3. Environment, Health and Safety in Industries | I,IV | e,f,g,I,h | | | | | | | |
| | 4. Environmental Hydraulics | I,II,V | a,b,g | | | | | | | |
| 19PMEWE311 | Geographical Information system lab | III | c,d,i | 0 | 0 | 2 | 2 | 40 | 60 | 100 |
| Total | | | | 8 | 0 | 2 | 10 | 160 | 240 | 400 |
| SEMESTER – IV | | | | | | | | | | |
| 19PMEWE4E0 | 1. Solid and Hazardous waste management | I,III | a,b,d | | | | | | | |
| | 2. Groundwater Modeling and Management | I,III | c,d,f,i | | | | | | | |
| | 3. Landfill Engineering And Remediation Technology | I,IV | e,f,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | 4. Air and Water Quality Modeling | I,II,V | a,b,h | | | | | | | |
| | 5. Flood and Drought Management | III,V | a,d,i | | | | | | | |
| 19PMEWE4E0 | 6. Rehabilitation And Modernisation of Irrigation Systems | I,III | a,b,j | | | | | | | |
| | 7. Watershed Conservation And Management | I,III | c,d,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | 8. Urban Water Resources Management | I,IV | e,f,i | | | | | | | |
| | 9. Water Power and Dam Engineering | I,II,V | a,b,i | | | | | | | |
| | 10. Coastal Engineering | III,V | a,d,j | | | | | | | |
| 19PMEWE411 | Numerical Analysis Lab | III | c,d,i | 0 | 0 | 2 | 2 | 40 | 60 | 100 |

| | | | | | | | | | | |
|----------------------|---|--|---|----------|----------|-----------|-----------|------------|------------|------------|
| 19PMEWE412 | Mini Project | III | c,d,i | 0 | 0 | 4 | 2 | 40 | 60 | 100* |
| Total | | | | 6 | 0 | 6 | 10 | 160 | 240 | 400 |
| SEMESTER – V | | | | | | | | | | |
| 19PMEWEOE0 | 1. Business Analytics 2. Industrial Safety 3. Operations Research 4. Cost Management of Engineering Projects 5. Composite Materials 6. Waste to Energy 7. Advanced Ground Water Hydrology 8. Resource And Energy Recovery From Waste | I,III I,III I,IV I,II,V III,V II,V III,IV I,III,V | a,b,d c,d,,h e,f,g a,b,g a,d,f a,f,i b,e,g, h,g c,e,g, i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PMEWE591 | Project Work – Phase I | III | c,d | 0 | 0 | 20 | 10 | 40 | 60 | 100 |
| Total | | | | 3 | 0 | 20 | 13 | 80 | 120 | 200 |
| SEMESTER – VI | | | | | | | | | | |
| 19PMEWE691 | Project Work – Phase II | III | c,d,i | 0 | 0 | 32 | 16 | 120 | 180 | 300 |
| Total | | | | 0 | 0 | 32 | 16 | 120 | 180 | 300 |

L-Lecture T-Tutorial P-Practical C-Credit

CIA – Continuous Internal Assessment

ESE – End semester Examination

Total credits = 71

Total Marks = 2100

*** To be evaluated internally by a committee of members**

Review 1& 2

– 60 marks

Final presentation and viva voce

– 40 marks

****-- Skill Development**

****-- Employability**

****--Entrepreneurship**



KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
(Established Under Section 3 of UGC Act 1956)
FACULTY OF ENGINEERING
Department of Computer Science and Engineering

List of PEOs, POs and PSOs

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- I. To perform well in their professional career by acquiring enough knowledge in the domain of Computer Science and Engineering.
- II. To improve communication skills, follow professional ethics and involve in team work in their profession.
- III. To update with evolving technology and use it for career advancement.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

- a) **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- b) **Problem Analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- c) **Design/ Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- d) **Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- e) **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- f) **The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- g) **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

h) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i) **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j) **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

k) **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

l) **Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs):

m1) The ability to apply, analyse, design and develop the application software that meet the automation needs of society and industry.

m2) The ability to understand the evolutionary changes in computing, apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success, real world problems and meet the challenges of the future.

PEO\ PO, PSO MAPPING:

| PO, PSO PEO | a | b | c | d | e | f | g | h | i | j | k | l | m1 | m2 |
|----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| PEO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| PEO2 | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | | | ✓ |
| PEO3 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ |

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
(Established Under Section 3 of UGC Act 1956)
FACULTY OF ENGINEERING
B.E (COMPUTER SCIENCE and ENGINEERING)
COURSE OF STUDY AND SCHEME OF EXAMINATION
(2019 BATCH ONWARDS)

| SEMESTER I | | | | | | | | | | | |
|-------------|---|-------------|-----------------------|---------------------------|------------------------|---|----|---------|---------------|-----|-------|
| COURSE CODE | COURSE TITLE | COURSE AREA | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | | PEO | PO, PSO | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | | 40 | 60 | 100 |
| 19BECS101 | Mathematics-I (Calculus and Linear Algebra for Computer Science Engineers) | BS | I,III | a,f,i,j | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BECS102 | English | HS | II | f,g,i | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BECS141 | Semiconductor Physics | BS | I | a,d,f, h,i,j, k | 3 | 1 | 3 | 5 | 40 | 60 | 100 |
| 19BECS142 | Programming For Problem Solving | ES | I | a,j,k, m | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| TOTAL | | | | | 11 | 2 | 9 | 17 | 160 | 240 | 400 |
| SEMESTER II | | | | | | | | | | | |
| COURSE CODE | COURSE TITLE | COURSE AREA | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | | PEO | PO, PSO | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | | 40 | 60 | 100 |
| 19BECS201 | Probability and Statistics | BS | I,III | a,h,i, j | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BECS241 | Chemistry-I | BS | I,III | a,b,c, d,e,f, i,j,k | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| 19BECS242 | Basic Electrical Engineering | ES | I,III | j,l | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BECS211 | Workshop/ Manufacturing Practices | ES | II | c,i,j | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| 19BECS212 | Engineering Graphics & Design | ES | I,II | g,j,k | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| TOTAL | | | | | 11 | 3 | 13 | 21 | 200 | 300 | 500 |

SEMESTER –III

| SEMESTER –III | | | | | | | | | | | |
|---------------|--|--------------|-----------------------|----------------|------------------------|---|----|---------|---------------|-----|-------|
| COURSE CODE | COURSE TITLE | COUR SE AREA | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | | PEO | PO,PSO | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | | 40 | 60 | 100 |
| 19BECS301 | Mathematics-III (Differential Calculus) | BS | I | a,b,c,d,f | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BECS302 | Environmental Studies | HS | II | f,g,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS311 | IT Workshop (SCILAB Programs) | PC | I | a,b,c,d,e | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| 19BECS341 | Analog Electronic Circuits | ES | I | a,b,c | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECS342 | Data structure & Algorithms | PC | I,III | a,b,c,d,m 1 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECS343 | Digital Electronics | PC | I | a,b,c | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECS351 | PC hardware Assembly and Troubleshooting | MC | I | a,b,e,m2 | 1 | 1 | 0 | 0 | 100 | - | 100 |
| TOTAL | | | | | 17 | 2 | 16 | 25 | 340 | 360 | 700 |

SEMESTER –IV

| SEMESTER –IV | | | | | | | | | | | |
|--------------|--------------------------------------|--------------|-----------------------|--------------------|------------------------|---|----|---------|---------------|-----|-------|
| COURSE CODE | COURSE TITLE | COURS E AREA | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | | PEO | PO,P SO | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | | 40 | 60 | 100 |
| 19BECS401 | Discrete Mathematics | PC | I | a,b,c,f | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BECS402 | Organizational Behavior | HS | II | f,h,I,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS441 | Computer Organization & Architecture | ES | I | a,b,c | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECS442 | Operating Systems | PC | I,III | a,b,c,d ,e,f,l, m1 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECS443 | Design and Analysis of Algorithms | PC | I,III | a,b,c,d ,f,m1 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECS451 | Mobile Application Development | MC | I | a,b,c,d ,e,f,m 2 | 0 | 1 | 1 | 0 | 100 | - | 100 |
| TOTAL | | | | | 15 | 2 | 13 | 22 | 300 | 300 | 600 |

SEMESTER –V

| COURSE CODE | COURSE TITLE | COURSE AREA | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|--------------|-----------------------------------|-------------|-----------------------|----------------------------|------------------------|----------|----------|-----------|---------------|------------|------------|
| | | | PEO | PO,P SO | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | | 40 | 60 | 100 |
| 19BECS501 | Signals and Systems | ES | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS502 | Formal Language & Automata Theory | PC | I | a,b,c,d,f,m1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS503 | Professional Ethics | HS | II,III | a,f,g,h,I,j,k,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS541 | Database Management Systems | PC | I | a,b,e,m1 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECS542 | Object Oriented Programming | PC | I | a,b,c,d,f,k,m1 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECSExx | Elective-I | PE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS551 | In plant Training | MC | I,III | a,b,c,d,e,f,g,h,I,j,k,l,m2 | - | - | - | 0 | 100 | - | 100 |
| TOTAL | | | | | 18 | 0 | 8 | 22 | 340 | 360 | 700 |

SEMESTER –VI

| COURSE CODE | COURSE TITLE | COURSE AREA | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|-------------|--------------------------------|-------------|-----------------------|--------------------|------------------------|---|---|---------|---------------|-----|-------|
| | | | PEO | PO,P SO | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | | 40 | 60 | 100 |
| 19BECS641 | Compiler Design | PC | I | a,b,c,d,m1 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECS642 | Computer Networks | PC | I,III | a,b,c,d,e,m1 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BECSExx | Elective-II | PE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSExx | Elective-III | PE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSOExx | Open Elective-I (Humanities) | OE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS651 | CCNA- Introduction to Networks | MC | I,III | a,b,c,e,m1,m2 | 0 | 0 | 1 | 0 | 100 | - | 100 |
| 19BECS691 | Project-1 | PW | I,III | a,b,c,d,e,f,g,h,I, | 0 | 0 | 6 | 3 | 40 | 60 | 100 |

| | | | | j,k,l | | | | | | | |
|----------------|--|--------------|-----------------------|----------------------------------|------------------------|---|----|---------|---------------|-----|-------|
| TOTAL | | | | | 15 | 0 | 15 | 22 | 340 | 360 | 700 |
| SEMESTER –VII | | | | | | | | | | | |
| COURSE CODE | COURSE TITLE | COUR SE AREA | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | | PEO | PO, PS O | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | | 40 | 60 | 100 |
| 19BECSExx | Elective-IV | PE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSExx | Elective-V | PE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSOE xx | Open Elective-II | OE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECC704 | Biology | BS | - | a,f | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BECS751 | CCNA –Routing and Switching Essentials | MC | I,III | a,b, c,e, m1 | 0 | 0 | 1 | 0 | 100 | 0 | 100 |
| 19BECS791 | Project-II | PW | I,III | a,b, c,d, e,f, g,h, I,j, k,l. m2 | 0 | 0 | 12 | 6 | 80 | 120 | 200 |
| TOTAL | | | | | 11 | 1 | 13 | 18 | 340 | 360 | 700 |
| SEMESTER –VIII | | | | | | | | | | | |
| COURSE CODE | COURSE TITLE | COUR SE AREA | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | | PEO | PO, PS O | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | | CIA | ESE | TOTAL |
| 19BECSExx | Elective-VI | PE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSOE xx | Open Elective-III | OE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECSOE xx | Open Elective-IV | OE | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS891 | Project-III | PW | I,III | a,b, c,d, e,f, g,h ,I,j, k,l, m2 | 0 | 0 | 12 | 6 | 80 | 120 | 200 |
| TOTAL | | | | | 9 | 0 | 12 | 15 | 200 | 300 | 500 |

Total Credits: 162

****-- Skill development**

****-- Enterpreneurship**

LIST OF PROFESSIONAL ELECTIVES

| Professional Electives for semester-V | | | | | | | | | | |
|--|----------------------------------|-----------------------|-------------|------------------------|---|---|---------|---------------|-----|-------|
| COURSE CODE | COURSE TITLE | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO,PSO | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | 40 | 60 | 100 |
| 19BECS5E01 | Advanced Data Structures | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS5E02 | Advanced Computer Architecture | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS5E03 | Design Patterns | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS5E04 | Advanced Databases | I,III | a,b,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Electives for semester-V | | | | | | | | | | |
| 19BECS5E05 | Advanced Operating Systems | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS5E06 | C# and.NET | I | a,b,c,d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS5E07 | Servlets and JSP | I | a,b,c,d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS5E08 | User Interface Design | I | a,b,c,f,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Electives for semester-VI | | | | | | | | | | |
| 19BECS6E01 | Internet of Things | I | a,b,c,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS6E02 | Network Routing Algorithms | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS6E03 | Distributed Computing | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS6E04 | Video Analytics | I,III | a,b,c,d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Electives for semester-VI | | | | | | | | | | |
| 19BECS6E05 | Wireless Sensor Networks | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS6E06 | Service Oriented Architecture | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS6E07 | Software Project Management | I,III | a,b,c,d,j,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS6E08 | TCP/IP Design and Implementation | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Electives for semester-VII | | | | | | | | | | |
| 19BECS7E01 | Managing Big Data | I,III | a,b,c,d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS7E02 | Ad Hoc Networks | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS7E03 | Cloud Computing | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS7E04 | Information Security | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS7E05 | Devops | I,III | a,b,c,d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Professional Electives for semester-VIII | | | | | | | | | | |
| 19BECS8E01 | Semantic Web | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS8E02 | E-Commerce | I | F | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS8E03 | Human Computer Interaction | I,III | a,b,c,d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECS8E04 | Natural Language | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--|---|----------|---------------|---|---|---|---|----|----|-----|
| 19BEEEOE01 | Electric Hybrid Vehicles | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE02 | Energy Management & Energy Auditing | I | a,b,c,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE03 | Programmable Logic Controller | I,II | a,b,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE04 | Renewable Energy Resources | I,II,III | a,b,c,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Electronics & Communication Engineering | | | | | | | | | | |
| 19BEECOE01 | Real Time Embedded Systems | I,II | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE02 | Consumer Electronics | I | a,b,c,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE03 | Neural Networks and its Applications | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE04 | Fuzzy Logic and its Applications | I,II | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE05 | Principles of Modern Communication System | I,II | a,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Food Technology | | | | | | | | | | |
| 19BTFTOE01 | Processing Of Food Materials | I, III | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | I | a,b,c,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat | I,II,III | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | I,II | a,b,c,g,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Bio Technology | | | | | | | | | | |
| 19BTBTOE01 | Bioreactor Design | I,II,III | a,b,c, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | I,III | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | I | a,b,c, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nano Biotechnology | I | a,b,c,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Mechanical Engineering | | | | | | | | | | |
| 19BEMEEOE01 | Computer Aided Design | I | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE02 | Industrial Safety and Environment | I | a,b,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE03 | Transport phenomena | I, III | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE04 | Introduction to Biomechanics | I,II,III | a,b,c,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Automobile Engineering | | | | | | | | | | |
| 19BEAEOE01 | Automobile Engineering | I, III | a,b,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Basics of two and three wheelers | I,II | a,b,d, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Automobile Maintenance | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Introduction to Modern Vehicle Technology | I,II,III | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE05 | Commercial Fleet Operation | I,III | a,b,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| Civil Engineering | | | | | | | | | | |
|--------------------------|--|-------|---------|---|---|---|---|----|----|-----|
| 19BECEOE01 | Housing, Plan and Management | I,III | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE02 | Building Services | I,III | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE03 | Repair And Rehabilitation Of Structures | I,II | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE04 | Computer-Aided Civil Engineering Drawing | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| Open Elective Courses Offered to other Departments | | | | | | | | | | |
|---|---------------------------------|-----------------------|----------------|------------------------|---|---|---------|---------------|-----|-------|
| COURSE CODE | COURSE TITLE | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO,PSO | L | T | P | | CIA | ESE | TOTAL |
| | | | | | | | | 40 | 60 | 100 |
| 19BEC SOE01 | Internet Programming | I,III | a,b,c,g,h,m1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE02 | Multimedia and Animation | I,III | a,b,c,g,h,j,m2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE03 | PC hardware and Troubleshooting | I | a,b,c,d,j,m1 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE04 | Java Programming | I,II | a,b,c,d,m1, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE05 | Machine Learning | I,II | a,b,g,h,,m2 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

i) COURSE AREA

1. BS-Basic Sciences
2. ES-Engineering Sciences
3. HS-Humanities and Sciences
4. PC-Professional Course
5. PE- Professional Elective
6. OE- Open Elective
7. PW-Project Work
8. MC-Mandatory Course

ii) PEOs -Programme Educational Objectives.

iii) PO-Programme Outcomes.

iv) PSO- Programme Specific Outcomes

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University Established Under Section 3 of UGC Act 1956)
Eachanari, Coimbatore-641 021. INDIA
FACULTY OF ENGINEERING

DEGREE OF BACHELOR OF ENGINEERING / TECHNOLOGY

REGULAR PROGRAMME

PROGRAMME EDUCATIONAL OBJECTIVES(PEOs):

1. To impart skill based training to apply engineering practices to design, implement model and analyze real time problems and interpret the result.
2. To impart students with strong fundamental knowledge in the field of Electronics and Communication Engineering to meet the emerging industrial needs and to promote Research
3. To build and lead cross-functional teams upholding the professional responsibilities & ethical values.

PROGRAMME OUTCOMES (POs)

- a) Apply knowledge of mathematics, basic sciences, engineering fundamentals and specialization to solve engineering problems
- b) Identify , design, formulate analyze & interpret data
- c) Design an integrated system with due considerations to public health, safely , societal and environment
- d) Investigate , formulate and solve industrial engineering problems
- e) Acquire skills to use modern engineering tools and software to solve complex engineering problems
- f) Apply societal and cultural issues in professional engineering practice.
- g) Understand the impact of engineering solutions in global and societal context
- h) Function as a member of multidisciplinary team
- i) Communicate effectively both orally and in writing
- j) Recognize the need for ability to engage in lifelong learning
- k) Understand the project management and finance

- l) Acquire knowledge to design, develop, predict and model an electronic system and also to implement communication protocols

PROGRAMME SPECIFIC OUTCOMES(PSOs)

- m) Be acquainted with the continuous learning in the field of Embedded systems, VLSI design, Communication and Signal Processing and hold expertise in the modern tools for quenching the techno-thirsty society.
- n) Incorporate the socio-responsible electronics and communication engineer with leadership, teamwork skills and exhibit a commitment to the lifelong learning

PEO-PO mapping

| | POa | POb | POc | POd | POe | POf | POg | POh | POi | POj | POk | POl |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| PEO1 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | | |
| PEO2 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | ✓ |
| PEO3 | | | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | ✓ |

PEO-PSO mapping

| | PSOm | PSOn |
|-------------|------|------|
| PEO1 | ✓ | ✓ |
| PEO2 | ✓ | ✓ |
| PEO3 | ✓ | |

| SEMESTER I | | | | | | | | | | |
|-------------|-----------------------------------|-----------------------|-----------------|------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC101 | Mathematics-I | 1,3 | a,e,g,j,k | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEC142 | Semiconductor Physics | 1,3 | a,b,d,e,g,j,k,l | 3 | 1 | 3 | 5 | 40 | 60 | 100 |
| 19BEEC103 | English | 2,3 | e,f,g,i | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BEEC144 | Programming For Problem Solving | 2 | a,b,j | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BEEC155 | Yoga | 3 | h,j | 1 | 0 | 0 | 0 | 100 | - | 100 |
| TOTAL | | | | 12 | 2 | 9 | 17 | 260 | 240 | 500 |
| SEMESTER II | | | | | | | | | | |
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC201 | Mathematics-II | 1,3 | a,e,g,j,k | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEC242 | Chemistry-I | 1,3 | a,b,d,e,g,j | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| 19BEEC243 | Basic Electrical Engineering | 1,2 | a,b,e,j | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEEC204 | Environmental Studies | 1,2,5 | b,c,e,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC215 | Workshop/ Manufacturing Practices | 1,2 | a,b,e,j | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| 19BEEC216 | Engineering Graphics & Design | 1,2 | a,b,e,j | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 14 | 3 | 13 | 24 | 240 | 360 | 600 |

| SEMESTER III | | | | | | | | | | |
|--------------|---|-----------------------|-------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEEC301 | Linear Algebra and Partial Differential Equations | 1,3 | a,e,g,j,k | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEEC302 | Electronic Devices | 1,2 | a,c,d,j,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC303 | Digital system design | 1,2 | a,b,c,e,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC304 | C++ and data structures | 1,3 | b,c,h,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC305 | Signals and systems | 1,2 | b,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC306 | Network Theory | 1,2 | b,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC311 | C++ and data structures Laboratory | 1,3 | b,c,e,h,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEEC312 | Electronic Devices Laboratory | 1,2 | b,c,e,d,j,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEEC313 | Digital system design Laboratory | 1,2 | b,c,e,l,m | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEEC351 | PCB Designing | 1,2 | e,l,m | 1 | 0 | 0 | - | 100 | - | 100 |
| TOTAL | | | | 19 | 1 | 6 | 22 | 460 | 540 | 1000 |

| SEMESTER IV | | | | | | | | | | |
|-------------|---|-----------------------|--------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC401 | Material Sciences | 1,2 | a,b,d,,g,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC402 | Analog circuits | 1,2 | a,b,c,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC403 | Analog and digital Communication | 1,2 | a,d,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC404 | Microcontroller | 1,2 | b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC405 | Economics for Engineers | 3 | d,h,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC411 | Microcontroller Laboratory | 1,2 | b,c,d,e,m | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEC412 | Analog circuits Laboratory | 1,2 | a,b,c,e,l,m | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEC413 | Analog and digital Communication Laboratory | 1,2 | a,d,e,l,m | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEC451 | Constitution of India | 3 | g | 1 | 0 | 0 | - | 100 | - | 100 |
| TOTAL | | | | 16 | 0 | 6 | 18 | 420 | 480 | 900 |

| SEMESTER V | | | | | | | | | | |
|---|--------------------------------------|-----------------------|-------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC501 | Probability and Random Processes | 1,3 | a,e,g,j,k | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEC502 | Computer Architecture | 1,2,3 | h,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC503 | Digital Signal Processing | 1,2 | a,b,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC504 | Electromagnetic waves | 1,2 | a,d,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE**/ 19BEC SOE**/ 19BEEEOE**/ 19BTBTOE**/ 19BEME OE**/ 19BEAEOE**/ 19BECOE**/ 19BTCEOE**/ 19BTFTOE**/ 19BEBMEOE** | Open Elective-I | 1,2,3 | c,e,h,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC5E** | Professional Elective-I | 1,2 | a,c,h,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC511 | Digital Signal Processing Laboratory | 1,2 | a,b,c,e,l,m | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEC512 | Antenna Laboratory | 1,2 | a,b,c,e,l,m | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEC551 | In plant Training | - | d,h,i,l,n | - | - | - | - | 100 | - | 100 |
| TOTAL | | | | 18 | 1 | 4 | 21 | 420 | 480 | 900 |

| SEMESTER VI | | | | | | | | | | |
|---|-----------------------------------|-----------------------|-----------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEEC601 | Total Quality management | 3 | d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC602 | Control systems | 1,2 | c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC603 | Computer Networks | 1,2,3 | c,h,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC6E** | Professional Elective-II | 1,2 | a,c,h,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE**/ 19BEC SOE**/ 19BEEEOE**/ 19BTBTOE**/ 19BEME OE**/ 19BEAEOE**/ 19BEC EO E**/ 19BTCE OE**/ 19BTFTOE**/ 19BEBMEOE** | Open Elective-II | 1,2,3 | c,e,h,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEC611 | Computer Networks Laboratory | 1,2,3 | c,e,h,l,m | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BEEEC612 | Electronic Measurement Laboratory | 1,2 | c,e,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEEC613 | Mini Project | 1,2,3 | g,h,l,m,n | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEEC651 | Soft Skills | 3 | i,j | 1 | - | - | - | 100 | - | 100 |
| TOTAL | | | | 16 | 0 | 8 | 19 | 420 | 480 | 900 |

| SEMESTER VII | | | | | | | | | | |
|--|--------------------------------|-----------------------|-----------|------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC701 | Professional Ethics | 3 | f,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E** | Professional Elective-III | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E** | Professional Elective-IV | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E** | Professional Elective-V | | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE**/ 19BEC SOE**/ 19BEEEOE**/ 19BTBTOE**/ 19BEME OE**/ 19BEAEOE**/ 19BECEOE**/ 19BTCEOE**/ 19BTFTOE**/ 19BEBMEOE** | Open Elective-III | 1,2,3 | c,e,h,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC791 | Project Work-Phase I | 1,2,3 | c,l,m,n | 0 | 0 | 10 | 5 | 100 | - | 100 |
| 19BEEC751 | VLSI Design using Cadence tool | 1,2 | c,e,i,l,m | 0 | 0 | 2 | 0 | 100 | - | 100 |
| TOTAL | | | | 15 | 0 | 12 | 20 | 400 | 300 | 700 |

| SEMESTER VII | | | | | | | | | | |
|--|-----------------------------------|-----------------------|-----------|------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BESHOE**/ 19BEC SOE**/ 19BEEEOE**/ 19BTBTOE**/ 19BEME OE**/ 19BEAEOE**/ 19BECEO E**/ 19BTCEO E**/ 19BTFTOE**/ 19BEBMEOE** | Open Elective-IV | 1,2,3 | c,e,h,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE**/ 19BEC SOE**/ 19BEEEOE**/ 19BTBTOE**/ 19BEME OE**/ 19BEAEOE**/ 19BECEO E**/ 19BTCEO E**/ 19BTFTOE**/ 19BEBMEOE** | Open Elective-V | 1,2,3 | c,e,h,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E** | Professional Elective-VI | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E** | Professional Elective-VII | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC891 | Project Work-Phase-II & Viva-Voce | 1,2,3 | c,l,m,n | 0 | 0 | 18 | 9 | 120 | 180 | 300 |
| TOTAL | | | | 12 | 0 | 18 | 21 | 280 | 420 | 700 |

PROFESSIONAL ELECTIVE LIST

SEMESTER V-ELECTIVE I

| SEMESTER V | | | | | | | | | | |
|-------------|-------------------------------|-----------------------|-----------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC5E01 | Biomedical Electronics | 1,2,3 | a,c,h,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC5E02 | Antennas and Wave Propagation | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC5E03 | Information theory and coding | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC5E04 | Sensors and Transducers | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 12 | 0 | 0 | 12 | 160 | 240 | 400 |

SEMESTER VI -ELECTIVE II

| SEMESTER VI | | | | | | | | | | |
|-------------|----------------------|-----------------------|-----------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC6E01 | Power Electronics | 1,2,3 | a,c,h,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC6E02 | Introduction to MEMS | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC6E03 | CMOS design | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC6E04 | Nano Electronics | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 12 | 0 | 0 | 12 | 160 | 240 | 400 |

SEMESTER VII - ELECTIVES III,IV & V

| SEMESTER VII | | | | | | | | | | |
|--------------|-------------------------|-----------------------|---------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC7E01 | Satellite Communication | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E02 | Embedded Systems | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--------------|---|-------|---------|-----------|----------|----------|-----------|------------|------------|-------------|
| 19BEEC7E03 | Microwave Theory and Techniques | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E04 | VLSI Technology | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E05 | Mixed Signal Design | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E06 | Internet of Things | 1,2,3 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E07 | Artificial Neural Networks | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E08 | Advanced Microprocessors | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E09 | Digital Logic Design with PLDs and VHDL | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E10 | Speech and Audio Processing | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E11 | Mobile Communication and Networking | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC7E12 | Digital Image and video processing | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 36 | 0 | 0 | 36 | 480 | 720 | 1200 |

SEMESTER VIII - ELECTIVE VI, VII

| SEMESTER VII | | | | | | | | | | |
|--------------|----------------------------|-----------------------|---------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEC8E01 | FPGA Design | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E02 | Fiber optic communication | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E03 | Wavelets | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E04 | High Speed Networks | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E05 | Error correcting codes | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E06 | Adaptive signal processing | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E07 | Wireless Sensor Networks | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEC8E08 | ASIC Design | 1,2 | a,c,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 24 | 0 | 0 | 24 | 320 | 480 | 800 |

OPEN ELECTIVE LIST
SEMESTER V, VI, VII&VIII

| SEMESTER V, VI, VII&VIII | | | | | | | | | | |
|----------------------------------|----------------------------------|-----------------------|-------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| Science and Humanities | | | | | | | | | | |
| 19BESH0E01 | Solid Waste Management | 1,3 | a,c,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E02 | Green Chemistry | 1,3 | c,e,h,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E03 | Applied Electrochemistry | 1,3 | c,e,h,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E04 | Industrial Chemistry | 1,3 | c,e,h,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E05 | Technical Writing | 1,3 | i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E06 | Geophysics | 1,3 | a,b,d,e,g,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E07 | Engineering Acoustics | 1,3 | a,b,d,e,g,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E08 | Industrial Mathematics – I | 1,3 | a,e,g,j,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E09 | Industrial Mathematics – II | 1,3 | a,e,g,j,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E10 | Fuzzy Mathematics | 1,3 | a,e,g,j,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E11 | Mathematical Physics | 1,3 | a,b,c,d,i,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH0E12 | Linear Algebra | 1,3 | a,e,g,j,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Computer Science and Engineering | | | | | | | | | | |
| 19BEC0E01 | Internet Programming | 1,3 | a,b,c,d,e,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E02 | Multimedia and Animation | 1,3 | a,b,c,d,e,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E03 | PC Hardware and Trouble shooting | 1,3 | a,b,c,d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E04 | Java Programming | 1,3 | a,b,c,d,e,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC0E05 | Machine Learning | 1,3 | a,b,c,d,e,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|--|---------------------------------------|-----------------------|-----------------|------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| Electrical and Electronics Engineering | | | | | | | | | | |
| 19BEEEOE01 | Electric Hybrid Vehicles | 1,3 | a,b,c,d,e,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE02 | Energy Management and Energy Auditing | 1,3 | a,d,f,g,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE03 | Programmable Logic Controller | 1,3 | a,d,f,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE04 | Renewable Energy Resources | 1,3 | a,d,f,g,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Biotechnology | | | | | | | | | | |
| 19BTBTOE01 | Bioreactor Design | 1,3 | a,b,c,d,e,g,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | 1,3 | a,b,c,d,e,g,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | 1,3 | a,b,c,d,e,g,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nanobiotechnology | 1,3 | a,b,c,d,e,g,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Mechanical Engineering | | | | | | | | | | |
| 19BEMEEOE01 | Computer Aided design | 1,3 | a,b,c,d,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE02 | Industrial safety and Environment | 1,3 | b,c,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE03 | Transport Phenomena | 1,3 | b,c,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE04 | Introduction to biomechanics | 1,3 | b,c,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Automobile Engineering | | | | | | | | | | |
| 19BEAEOE01 | Automobile Engineering | 1,3 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Two and Three Wheeler Technology | 1,3 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Vehicle Maintenance | 1,3 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Modern Vehicle Technology | 1,3 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE05 | Fleet Management | 1,3 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|------------------------|---|-----------------------|-------------------|------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| Civil Engineering | | | | | | | | | | |
| 19BECEOE01 | Housing, Plan and Management | 1,3 | a,b,c,d,e,f,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE02 | Building Services | 1,3 | a,b,c,d,e,f,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE03 | Repair and Rehabilitation Of Structures | 1,3 | a,b,c,d,e,f,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE04 | Computer Aided Civil Engineering Drawing | 1,3 | a,b,c,d,e,f,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Chemical Engineering | | | | | | | | | | |
| 19BTCEOE01 | Energy Management in Chemical Industries | 1,3 | a,d,f,g,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE02 | Fertilizer Technology | 1,3 | c,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE03 | Industrial Wastewater Treatment | 1,3 | c,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE04 | Solid & Hazardous Waste Management | 1,3 | c,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Food Technology | | | | | | | | | | |
| 19BTFTOE01 | Processing of Food Materials | 1,3 | a,b,c,d,e,g,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 1,3 | a,b,c,d,e,g,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 1,3 | a,b,c,d,e,g,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 1,3 | b,c,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| Biomedical Engineering | | | | | | | | | | |
| 19BEBMEOE01 | Robotics in Medicine | 1,3 | a,d,e,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOE02 | Virtual Reality and Augmented Reality | 1,3 | d,e,j,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOE03 | Artificial organs and Implants | 1,3 | c,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

COURSES OFFERED TO OTHER DEPARTMENTS

| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
|---|---|-----------------------|-----------------|------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| Electronics and Communication Engineering | | | | | | | | | | |
| 19BEECOE01 | Real Time Embedded Systems | 1,2,3 | a,b,c,d,e,j,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE02 | Consumer Electronics | 1,2,3 | a,b,c,d,e,j,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE03 | Neural Networks and its Applications | 1,2,3 | a,b,c,d,e,j,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE04 | Fuzzy Logic and its Applications | 1,2,3 | a,b,c,d,e,j,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE05 | Principles of Modern Communication System | 1,2,3 | a,b,c,d,e,j,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| |
|-------------------|
| Color code |
| Employability |
| Skill |
| Development |
| Entrepreneurship |

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING
CURRICULUM 2019
(FULL TIME PROGRAMME)

Department of Electrical and Electronics Engineering
FACULTY OF ENGINEERING



KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

(Established Under Section 3 of UGC Act, 1956)

**Pollachi Main Road, Eachanari Post,
Coimbatore- 641021, India.**

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
FACULTY OF ENGINEERING
UG PROGRAM (CBCS) – B.E –EEE (FULL TIME)
(2019–2020 Batch and onwards)

| SEMESTER I | | | | | | | | | | |
|-------------|---|-----------------------|-----------------|------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEE101 | Mathematics-I (Calculus and Differential Equations) | 1,2 | a,b,e,l | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEE102 | English | 2 | i,j,l | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BEEE141 | Waves, Optics and Introduction to Quantum Mechanics | 1,2 | a,g,j,k, l | 3 | 1 | 3 | 5 | 40 | 60 | 100 |
| 19BEEE142 | Programming For Problem Solving (With C) | 1 | a,b,c,d ,e,l | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| TOTAL | | | | 11 | 2 | 9 | 17 | 160 | 240 | 400 |
| SEMESTER II | | | | | | | | | | |
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEE201 | Mathematics-II (Linear Algebra, Transform calculus and Numerical Method) | 2 | a,b,c,e,l | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEE241 | Chemistry-I | 1,2 | a,b,c,e,l | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| 19BEEE242 | Basic Electrical Engineering | 1,2 | a,b,c,e,g ,l | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEEE211 | Workshop/ Manufacturing Practices | 1,2 | a,c,d,e,f, j | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| 19BEEE212 | Engineering Graphics& Design | 1,2 | c,d | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 11 | 3 | 13 | 21 | 200 | 300 | 500 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|--------------------------|---------------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – III | | | | | | | | | | |
| 19BEEE301 | Electrical Circuit Analysis | 1 | a,b,c,d,e,l | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEE302 | Analog Electronics | 2 | a,b,c,d,e,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE303 | Electrical Machines – I | 1 | a,b,c,d,e,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE304 | Electromagnetic Fields | 1 | a,b,c,d,e,j | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEE305 | Engineering Mechanics | 2 | a,c,d,f | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEE311 | Analog Electronics Laboratory | 2 | a,d,e,k,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEE312 | Electrical Machines Laboratory - I | 1 | a,d,e,k,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEE351 | NSS/NCC/PCB Design/Electricity Standards | | | | | | | | | 0 |
| Semester Total | | | | 15 | 3 | 4 | 20 | 280 | 420 | 700 |
| SEMESTER – IV | | | | | | | | | | |
| 19BEEE401 | Digital Electronics | 2 | a,d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE402 | Electrical Machines – II | 1 | a,b,c,d,e,g,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE403 | Power Electronics | 2 | a,b,c,d,e,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE404 | Signals and Systems | 1 | a,b,c,d,e,g,l | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE405 | Mathematics – III (Probability and Statistics) | 1 | a,b ,d,i | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEEE406 | Environmental Studies | 1 | a,c,e,f,g,h,l | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE411 | Digital Electronics Laboratory | 2 | a,d,e,k,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEE412 | Power Electronics Laboratory | 2 | a,c,d,j,k,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEE413 | Electrical machines Lab-II | 1 | a,b,c,d,e,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEE451 | Constitution of India/ Essence of Indian Traditional Knowledge | | | | | | | | | 0 |
| Semester Total | | | | 16 | 3 | 6 | 22 | 360 | 540 | 900 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|--------------------------|---------------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - V | | | | | | | | | | |
| 19BEEE501 | Power Systems – I | 2 | a,b,c,d,e,g,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE502 | Control Systems | 1 | a,b,c,d,e,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE503 | Microprocessors | 1 | a,c,e,h,i,k,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE504 | Engineering Economics and Financial Management | 1 | a,e,f,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE5E__ | Program Elective - I | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE__5OE__ | Open Elective-I | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE511 | Power Systems Laboratory – I | 2 | a,c,d,j,k,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEE512 | Control Systems Laboratory | 1 | c,d,e,f,i,j | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEE513 | Microprocessors Laboratory | 1 | a,c,d,j,k,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| Semester Total | | | | 18 | 0 | 6 | 21 | 360 | 540 | 900 |
| SEMESTER – VI | | | | | | | | | | |
| 19BEEE601 | Total Quality Management | - | b,e,f,g,h,i,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE602 | Power Systems – II | 1 | a,b,c,d,e,g,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE641 | Measurements and Instrumentation | 1 | a,b,c,d,e,l | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BEEE6E__ | Program Elective - II | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E__ | Program Elective - III | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE__6OE__ | Open Elective-II | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE611 | Power Systems Laboratory – II | 1 | a,c,d,j,k,l | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 19BEEE612 | Electronics Design Laboratory | 2 | a,d,e,k,l | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| Semester Total | | | | 18 | 0 | 8 | 22 | 320 | 480 | 800 |

| Course code | Name of the course | Objective s and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|-----------------|----------------------|---------------------------------|----------------|-----------------------------|----|----|-----------|---------------|------|-----------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Tot al |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - VII | | | | | | | | | | |
| 19BEEE701 | Professional Ethics | - | a,b,d g,k,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE7E__ | Program Elective -IV | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE7E__ | Program Elective -V | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE__7OE__ | Open Elective-III | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE__7OE__ | Open Elective-IV | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE791 | Project Stage-I | 1,2 | - | 0 | 0 | 6 | 3 | 80 | 120 | 200 |
| Semester Total | | | | 15 | 0 | 6 | 18 | 280 | 420 | 700 |
| SEMESTER – VIII | | | | | | | | | | |
| 19BEEE8E__ | Program Elective -VI | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE__8OE__ | Open Elective-V | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE__8OE__ | Open Elective-VI | | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE891 | Project Stage-II | 1,2 | - | 0 | 0 | 16 | 8 | 80 | 120 | 200 |
| Semester Total | | | | 9 | 0 | 16 | 17 | 200 | 300 | 500 |
| Program Total | | | | 113 | 11 | 68 | 158 | 2160 | 3240 | 5400 |

TOTAL CREDITS: 158

PROFESSIONAL ELECTIVE COURSES

| SEMESTER V | | | | | | | | | | |
|-------------|---|-----------------------|-----------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEE5E01 | Electrical Machine Design | 1 | a,c,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE5E02 | Industrial Automation | 1 | a,c,d,e,k,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE5E03 | Sensor and Transducer | 1 | a,b,c,e,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| SEMESTER VI | | | | | | | | | | |
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEE6E01 | Digital Control Systems | 1 | b,c,h,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E02 | Digital Signal Processing | 1 | a,b,c,d,e,g,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E03 | Computer Architecture | 1 | a,c,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E04 | Electromagnetic Waves | 1 | a,b,c,d,e,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E05 | Computational Electromagnetics | 1 | a,b,c,d,e,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E06 | Control Systems Design | 1 | a,c,e,h,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E07 | Industrial Electrical Systems | 1 | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E08 | Electrical Drives | 1 | a,c,d,e,h,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E09 | Line Commutated and Active Rectifiers | 2 | a,c,d,e,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E10 | High Voltage Engineering | 2 | a,b,c,d,e,g,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE6E11 | Electrical Energy Conservation and Auditing | 2 | b,e,f,g,h,i,j,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| SEMESTER VII | | | | | | | | | | |
|---------------|-----------------------------------|-----------------------|---------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEE7E01 | Wind and Solar Energy Systems | 2 | a,b,c,d,e,g,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE7E02 | Electrical and Hybrid Vehicles | 2 | a,c,d,h,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE7E03 | Power System Protection | 2 | a,b,c,d,e,g,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE7E04 | HVDC Transmission Systems | 2 | a,b,c,h,i,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE7E05 | Power Quality and FACTS | 2 | a,b,c,d,e,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE7E06 | Power System Dynamics and Control | 2 | a,c,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| SEMESTER VIII | | | | | | | | | | |
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEE8E01 | Advanced Electric Drives | 1 | a,b,c,d,e,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE8E02 | Power System Stability | 2 | d,e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE8E03 | Power Generation Systems | 2 | c,d,e,g,h,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEE8E04 | Virtual Instrumentation | 1 | a,b,e,h,l,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

LIST OF OPEN ELECTIVES
COURSE OFFERED BY OTHER DEPARTMENT

| SUB. CODE | TITLE OF THECOURSE | PEO | PO | L | T | P | C | CIA | ESE | TOTAL |
|---|--|------|---------------|---|---|---|---|-----|-----|-------|
| AUTOMOBILE ENGINEERING | | | | | | | | | | |
| 19BEAEOE01 | Automobile Engineering | 1,2 | a,b,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Two And Three Wheeler Technology | 1,2 | a,b,d, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Vehicle Maintenance | I | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Modern Vehicle Technology | 1,2, | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE05 | Fleet Management | 1,2 | a,b,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOMEDICAL ENGINEERING | | | | | | | | | | |
| 19BEBMEOE01 | Robotics in medicine | 1,2, | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOE02 | Virtual Reality and Augmented Reality | 1,2 | a,b,d,g,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOE03 | Artificial organs and Implants | 1 | a,b,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOTECHNOLOGY | | | | | | | | | | |
| 19BTBTOE01 | Bioreactor Design | 1,2, | a,b,c, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | 1,2 | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | 1 | a,b,c, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nano biotechnology | 1 | a,b,c,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CHEMICAL ENGINEERING | | | | | | | | | | |
| 19BTCEOE01 | Energy Management in Chemical Industries | 1,2 | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE02 | Fertilizer Technology | 1,2 | a,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE03 | Industrial wastewater treatment | 1 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE04 | Solid and Hazardous waste management | 1 | a,b, g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CIVIL ENGINEERING | | | | | | | | | | |
| 19BECEOE01 | Housing, Plan and Management | 1,2 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE02 | Building Services | 1,2 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE03 | Repair and Rehabilitation of Structures | 1,2 | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE04 | Computer Aided Civil Engineering Drawing | 1 | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COMPUTER SCIENCE AND ENGINEERING | | | | | | | | | | |
| 19BECSOE01 | Internet Programming | 1,2 | a,b,c,g,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--|---|------|---------------|---|---|---|---|----|----|-----|
| 19BEC SOE02 | Multimedia and Animation | 1,2 | a,b,c,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE03 | PC Hardware and Trouble shooting | 1 | a,b,c,d ,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE04 | Java Programming | 1,2 | a,b,c,d, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE05 | Machine Learning | 1,2 | a,b,g,h, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRONICS AND COMMUNICATION ENGINEERING | | | | | | | | | | |
| 19BEE COE01 | Real Time Embedded Systems | 1,2 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE COE02 | Consumer Electronics | 1 | a,b,c,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE COE03 | Neural Networks and its Applications | 1 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE COE04 | Fuzzy Logic and its Applications | 1,2 | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEE COE05 | Principles of Modern Communication System | 1,2 | a,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| FOOD TECHNOLOGY | | | | | | | | | | |
| 19BTFTOE01 | Processing of Food Materials | 1,2 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 1 | a,b,c,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 1,2, | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 1,2 | a,b,c,g,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| MECHANICAL ENGINEERING | | | | | | | | | | |
| 19BEME OE01 | Computer Aided Design | 1 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME OE02 | Industrial Safety and Environment | 1 | a,b,d,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME OE03 | Transport Phenomena | 1,2 | a,b,c,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME OE04 | Introduction to Biomechanics | 1,2 | a,b,c,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| SCIENCE AND HUIMANITIES | | | | | | | | | | |
| 19BESH OE01 | Solid Waste Management | 1,2 | a,b,c,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE02 | Green Chemistry | 1 | a,b,c,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE03 | Applied Electrochemistry | 1,2, | a,b,c, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE04 | Industrial Chemistry | 1,2 | a,b,c,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE05 | Technical writing | 1 | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE06 | Geophysics | 1 | a,b,c, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE07 | Engineering Acoustics | 1,2 | a,b,c,d,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE08 | Industrial Mathematics I | 1,2 | a,b,d,g,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE09 | Industrial Mathematics II | 1,2 | a,c,d,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE10 | Fuzzy Mathematics | 1 | a,b,c | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESH OE11 | Mathematical Physics | 1 | a,g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--|-------------------------------------|-----|-----------------|---|---|---|---|----|----|-----|
| 19BESH0E12 | Linear Algebra | 1,2 | a,b, g,h,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COURSES OFFERED TO OTHER DEPARTMENT | | | | | | | | | | |
| 19BEEEOE01 | Electric Hybrid Vehicle | 2 | a,c,d,h,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE02 | Energy Management & Energy Auditing | 2 | b,e,f,g,h,i,j,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE03 | Programmable Logic Controller | 1,2 | a,b,d,e,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE04 | Renewable Energy Resources | 1 | a,b,c,d,e,g,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

****--Skill Development**

****--Employability**

****--Entrepreneurship**

PROGRAM OUTCOMES: On successful completion of the programme,

| | |
|---|---|
| a | Apply the Mathematical knowledge and the basics of Science and Engineering to solve the problems pertaining to Electronics and Instrumentation Engineering. |
| b | Identify and formulate Electrical and Electronics Engineering problems from research literature and be able to analyze the problem using first principles of Mathematics and Engineering Sciences. |
| c | Come out with solutions for the complex problems and to design system components or process that fulfill the particular needs taking into account public health and safety and the social, cultural and environmental issues. |
| d | Draw well-founded conclusions applying the knowledge acquired from research and research methods including design of experiments, analysis and interpretation of data and synthesis of information and to arrive at significant conclusion. |
| e | Form, select and apply relevant techniques, resources and Engineering and IT tools for Engineering activities like electronic prototyping, modeling and control of systems and also being conscious of the limitations. |
| f | Understand the role and responsibility of the Professional Electrical and Electronics Engineer and to assess societal, health, safety issues based on the reasoning received from the contextual knowledge. |
| g | Be aware of the impact of professional Engineering solutions in societal and environmental contexts and exhibit the knowledge and the need for Sustainable Development. |
| h | Apply the principles of Professional Ethics to adhere to the norms of the engineering practice and to discharge ethical responsibilities. |
| i | Function actively and efficiently as an individual or a member/leader of different teams and multidisciplinary projects. |
| j | Communicate efficiently the engineering facts with a wide range of engineering community and others, to understand and prepare reports and design documents; to make effective presentations and to frame and follow instructions. |
| k | Demonstrate the acquisition of the body of engineering knowledge and insight and Management Principles and to apply them as member / leader in teams and multidisciplinary environments. |
| l | Recognize the need for self and life-long learning, keeping pace with technological challenges in the broadest sense. |

PROGRAM SPECIFIC OUTCOMES:

| | |
|---|--|
| m | Apply the Mathematical knowledge and the basics of Science and Engineering to solve the problems pertaining to Electronics and Instrumentation Engineering |
| n | Identify and formulate Electrical and Electronics Engineering problems from research literature and be able to analyze the problem using first principles of Mathematics and Engineering Sciences. |

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

| | |
|-------|---|
| PEO 1 | Have successful technical and professional careers in their chosen fields such as circuit theory, Field theory, control theory and computational platforms. |
| PEO 2 | Engross in life long process of learning to keep themselves abreast of new developments in the field of Electronics and their applications in power engineering |

MAPPING

| PROGRAMME EDUCATIONAL OBJECTIVES | PROGRAM OUTCOMES & PROGRAM SPECIFIC OUTCOMES | | | | | | | | | | | | | |
|----------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k | l | m | n |
| 1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | ✓ |

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
FACULTY OF ENGINEERING
UG PROGRAM (CBCS) – B.E –EEE (PART TIME)
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|--------------------------|-----------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - I | | | | | | | | | | |
| 19PBEEE101 | Engineering Mathematics-I | 1 | a,b,e,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE102 | Electrical Machines -I | 1,2 | a,b,d,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE103 | ElectronicDevices and Circuits | 1,2 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE104 | Computer Fundamentals and C Programming | 1,2 | a,e,h,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE111 | Computer Practices &Programming Laboratory | 1,2 | a,e,h,i,j | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 12 | 0 | 3 | 14 | 200 | 300 | 500 |
| SEMESTER – II | | | | | | | | | | |
| 19PBEEE201 | Engineering Mathematics -II | 1 | a,b,e,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE202 | Electrical Machines-II | 1,2 | a,b,d,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE203 | Measurements and Instrumentation | 1,2 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE204 | Environmental Sciences | 1,2 | c,f, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE211 | DC and ACMachines Laboratory | 1,2 | a,b,d,i | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 12 | 0 | 3 | 14 | 200 | 300 | 500 |
| Program Total | | | | 24 | 0 | 6 | 28 | 400 | 600 | 1000 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|--------------------------|-----------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - III | | | | | | | | | | |
| 19PBEEE301 | Power Electronics | 1 | a,b,e,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE302 | Analysis of Electric Circuits | 1,2 | a,b,d,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE303 | Control System Engineering | 1,2 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE304 | Renewable Energy Sources | 1,2 | a,e,h,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE311 | Control System Engineering Laboratory | 1,2 | a,e,h,i,j | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 12 | 0 | 3 | 14 | 200 | 300 | 500 |
| SEMESTER – IV | | | | | | | | | | |
| 19PBEEE401 | Solid State Drives | 1 | a,b,e,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE402 | Transmission and Distribution Systems | 1,2 | a,b,d,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE403 | Linear Integrated Circuits | 1,2 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE404 | Power Plant Engineering | 1,2 | c,f, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE411 | Power Electronics and Drives Laboratory | 2 | a,b,d,i | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 12 | 0 | 3 | 14 | 200 | 300 | 500 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|--------------------------|-----------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - V | | | | | | | | | | |
| 19PBEEE501 | High Voltage Engineering | 1 | a,b,e,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE502 | Power System Analysis | 1,2 | a,b,d,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE5-- | Professional Elective I | 1,2 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE5-- | Professional Elective II | 1,2 | a,e,h,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE511 | Electronics Laboratory | 1,2 | a,e,h,i,j | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19PBEEE551 | Mini Project | | | 0 | 0 | 3 | 1 | 100 | 0 | 100 |
| Semester Total | | | | 12 | 0 | 6 | 15 | 300 | 300 | 600 |
| SEMESTER – VI | | | | | | | | | | |
| 19PBEEE601 | Power System Operation and Control | 1 | a,b,e,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE602 | Engineering Economics and Financial Management | 1,2 | a,b,e,d,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE6E__ | Professional Elective III | 1,2 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE6E__ | Professional Elective IV | 1,2 | a,c,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE611 | Power System Simulation Laboratory | 2 | a,b,d,i | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19PBEEE691 | Project work and Viva-Voce Phase 1 | | | 0 | 0 | 3 | 3 | 40 | 60 | 100 |
| Semester Total | | | | 12 | 0 | 6 | 17 | 240 | 360 | 600 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|------------------------------------|--------------------------|---------|--------------------------|---|----|-----------|---------------|------|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - VII | | | | | | | | | | |
| 19PBEEE701 | Total Quality Management | 1 | a,b,e,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE7E__ | Professional Elective V | 1,2 | a,b,d,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE7E__ | Professional Elective VI | 1,2 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEEE791 | Project work and Viva-Voce Phase 2 | 1,2 | a,e,h,i | 0 | 0 | 9 | 6 | 120 | 180 | 300 |
| Semester Total | | | | 9 | 0 | 9 | 15 | 240 | 360 | 600 |
| Program Total | | | | 81 | 0 | 33 | 103 | 1580 | 2220 | 3800 |

LIST OF ELECTIVES

| PROFESSIONAL ELECTIVE –I & II | | | | | | | | | | | |
|---------------------------------|-------------|---|------|---------------|---|---|---|---|-----|-----|-------|
| S. No | SUB. CODE | TITLE OF THE COURSE | PE O | PO & PS O | L | T | P | C | CIA | ESE | TOTAL |
| 1. | 19PBEEE5E01 | Data Structures and Algorithms | 1 | a,b,c,d,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2. | 19PBEEE5E02 | Computer Networks | 1 | a,b,c,d,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3. | 19PBEEE5E03 | Network Analysis and Synthesis | 1 | a,b,c,d,k,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4. | 19PBEEE5E04 | Special Electrical Machines | 1,2 | a,b,c,f,k,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5. | 19PBEEE5E05 | Energy Management, Utilization and Auditing | 1,2 | a,b,e,d,k,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6. | 19PBEEE5E06 | Distributed Generation | 1,2 | a,e,f,g | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 7. | 19PBEEE5E07 | Industrial Automation | 1,2 | a,c,d,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 8. | 19PBEEE5E08 | Consumer Electronics | 1 | a,c,j,k,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PROFESSIONAL ELECTIVE –III & IV | | | | | | | | | | | |
| 1. | 19PBEEE6E01 | Design of Electrical Apparatus | 1,2 | a,b,c,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2. | 19PBEEE6E02 | Digital Logic Circuits | 1,2 | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3. | 19PBEEE6E03 | HVDC and EHVAC | 1,2 | a,c,d,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4. | 19PBEEE6E04 | Computer Architecture | 1 | a,b,c,d,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5. | 19PBEEE6E05 | Introduction to Neural Networks | 1,2 | a,c,d,h,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | | |
|--|-------------|--|------|-----------|---|---|---|---|----|----|-----|
| 6. | 19PBEEE6E06 | Biomedical Instrumentation | 1, 2 | a,c,d,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 7. | 19PBEEE6E07 | Sensors and Transducers | 1, 2 | a,b,c,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 8. | 19PBEEE6E08 | Flexible AC Transmission Systems | 1, 2 | a,b,c,d,k | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 9. | 19PBEEE6E09 | Professional Ethics | 1 | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 10. | 19PBEEE6E10 | Microprocessor and Microcontroller | 1, 2 | a,b,d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PROFESSIONAL ELECTIVE –V & VI | | | | | | | | | | | |
| 1. | 19PBEEE7E01 | Fuzzy logic and its Applications | 1, 2 | b,d,I,j,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2. | 19PBEEE7E02 | Digital Signal Processing | 1, 2 | b,d,I,j | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3. | 19PBEEE7E03 | Power Quality | 1,2 | a,c,d,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4. | 19PBEEE7E04 | Power System Restructure | 1,2 | b,c,d,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5. | 19PBEEE7E05 | Modern Semiconductor Devices | 1,2 | b,c,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6. | 19PBEEE7E06 | Industrial Electronics | 1,2 | a,b,c,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 7. | 19PBEEE7E07 | Smart Grid | 1,2 | a,b,c,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 8. | 19PBEEE7E08 | Electric Hybrid Vehicle | 1,2 | a,c,d,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 9. | 19PBEEE7E09 | Power System Protection and Switchgear | 1,2 | b,c,d,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

****--Skill Development**

****--Employability**

****--Entrepreneurship**

PROGRAM OUTCOMES: On successful completion of the programme,

| | |
|----------|--|
| a | Apply the Mathematical knowledge and the basics of Science and Engineering to solve the problems pertaining to Electronics and Instrumentation Engineering |
| b | Identify and formulate Electrical and Electronics Engineering problems from research literature and be able to analyze the problem using first principles of Mathematics and Engineering Sciences. |
| c | Come out with solutions for the complex problems and to design system components or process that fulfill the particular needs taking into account public health and safety and the social, cultural and environmental issues |
| d | Draw well-founded conclusions applying the knowledge acquired from research and research methods including design of experiments, analysis and interpretation of data and synthesis of information and to arrive at significant conclusion |
| e | Form, select and apply relevant techniques, resources and Engineering and IT tools for Engineering activities like electronic prototyping, modeling and control of systems and also being conscious of the limitations. |
| f | Understand the role and responsibility of the Professional Electrical and Electronics Engineer and to assess societal, health, safety issues based on the reasoning received from the contextual knowledge. |
| g | Be aware of the impact of professional Engineering solutions in societal and environmental contexts and exhibit the knowledge and the need for sustainable Development. |
| h | Apply the principles of Professional Ethics to adhere to the norms of the engineering practice and to discharge ethical responsibilities. |
| i | Function actively and efficiently as an individual or a member/leader of different teams and multidisciplinary projects |
| j | Communicate efficiently the engineering facts with a wide range of engineering community and others, to understand and prepare reports and design documents; to make effective presentations and to frame and follow instructions. |
| k | Demonstrate the acquisition of the body of engineering knowledge and insight and Management Principles and to apply them as member / leader in teams and multidisciplinary environments |
| l | Recognize the need for self and life-long learning, keeping pace with technological challenges in the broadest sense. |

PROGRAM SPECIFIC OUTCOMES:

| | |
|----------|--|
| m | Apply the Mathematical knowledge and the basics of Science and Engineering to solve the problems pertaining to Electronics and Instrumentation Engineering |
| n | Identify and formulate Electrical and Electronics Engineering problems from research literature and be able to analyze the problem using first principles of Mathematics and Engineering Sciences. |

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

| | |
|--------------|---|
| PEO 1 | Have successful technical and professional careers in their chosen fields such as circuit theory, Field theory, control theory and computational platforms. |
| PEO 2 | Engross in life long process of learning to keep themselves abreast of new developments in the field of Electronics and their applications in power engineering |

MAPPING:

| PEO PO&PSO | a | b | c | d | e | f | g | h | i | j | k | l | m | n |
|---------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| PEO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| PEO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | ✓ |

19PBEEE101

ENGINEERING MATHEMATICS I

3H-3C

Instruction Hours / week: L: 3 T: 0 P: 0

Marks: Internal: 40

External: 60 Total: 100

End Semester Exam: 3 Hours

Course Objectives

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
- To understand geometrical aspects of curvature and elegant application of differential calculus which are needed in Engineering applications.
- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model Engineering problems.
- To familiarize the student with functions of several variables which is the foundation for many branches of Engineering.
- To introduce sequence and series which is central to many applications in Engineering.
- To solve problems by applying Differential calculus and Transforms

Course Outcomes (COs)

Upon completion of this course the students will be able

1. To solve the rank, Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices and the students will be able to use matrix algebra techniques for practical applications.
2. To equip the students to have basic knowledge and understanding in one field of materials, differential calculus
3. To solve simple standard examples using the ideas of differential equations.
4. To apply various techniques to solve Partial Differential Equations
5. To develop the tool of power series for learning advanced Engineering Mathematics.
6. To apply the knowledge acquired to solve various Engineering problems.

UNIT I MATRICES

Review of Matrix Algebra - Characteristic equation – Eigen values and Eigenvectors of a real matrix – Properties – Cayley-Hamilton theorem (excluding proof) – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic forms – Reduction to canonical form through orthogonal reduction.

UNIT II DIFFERENTIAL CALCULUS

Overview of Derivatives - Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes- Evolutes as Envelope of normals.

UNIT III DIFFERENTIAL EQUATIONS

Introduction to Ordinary differential equations: Linear ordinary differential equations of second and higher order with constant coefficients. Introduction to Partial differential equations: Linear Partial differential equations of second and higher order with constant coefficients.

UNIT-IV ANALYTIC FUNCTIONS

Analytic functions - Necessary and Sufficient conditions for an analytic function (without proof) – Cauchy-Riemann equations – Harmonic - Properties of analytic functions – Construction of an analytic function - Conformal mapping: $w = z+a$, az , $1/z$ and bilinear transformation.

UNIT- V Z -TRANSFORM AND DIFFERENCE EQUATIONS



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS
ENGINEERING
FACULTY OF ENGINEERING
PG PROGRAM (CBCS) – M.E POWER SYSTEMS ENGINEERING
(FULL TIME)
(2019–2020 Batch and onwards)**

| Course Code | Name of the Course | Category | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | | Page No. |
|----------------------|---|----------|--------------------------|---------|--------------------------|---|---|-----------|---------------|-----|-------|-------------------------|
| | | | PEOs | POs | L | T | P | | CIA | ESE | Total | |
| SEMESTER I | | | | | | | | | | | | |
| 19MEPS101 | Power System Analysis | PCC | 1,2,3 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 5 |
| 19MEPS102 | Power System Dynamics-I | PCC | 1,2,4 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 6 |
| 19MEPS103 A/B/C/D | Renewable Energy System/ SmartGrids/ High Power Converters/ Wind and Solar Systems | PE | 1,2,4 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 7/8/ 10/ 11 |
| 19MEPS104 A/B/C/D | Electrical Power Distribution System/ Mathematical Methods for Power Engineering/ Pulse Width Modulation for PE Converters/ Electric and Hybrid Vehicles | PE | 1,2,4 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 12/ 13/ 14/ 15 |

M.E (Power Systems Engineering) 2019-2020

| | | | | | | | | | | | | |
|--|---|------|-------|---------|-----------|----------|----------|-----------|------------|------------|------------|-------------------------|
| 19MEPS105 | Research Methodology and IPR | HSMC | 1,2,4 | a,b,d,f | 3 | 0 | 0 | 2 | 40 | 60 | 100 | 17 |
| 19MEPS111 | Power System Steady State Analysis Lab | PCC | 1,2,3 | a,b,d,f | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 18 |
| 19MEPS112 A/B | Power System Dynamics Lab/ Renewable Energy Lab | PCC | 1,2,3 | a,b,d,f | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 20 |
| VAC 19MEPS151 A/B/C/D (Audit 1) | English for Research Paper Writing/ Disaster Management/ Sanskrit for Technical Knowledge/ Value Education | OE | 1,2,3 | a,b,d,f | 0 | 0 | 3 | 2 | 100 | 0 | 100 | |
| Total | | | | | 15 | 0 | 9 | 20 | 380 | 420 | 800 | |
| SEMESTER II | | | | | | | | | | | | |
| 19MEPS201 | Digital Protection of Power System | PCC | 1,2,3 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 21 |
| 19MEPS202 | Power System Dynamics-II | PCC | 1,2,3 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 22 |
| 19MEPS203 A/B/C/D | Restructured Power Systems/ Advanced Digital Signal Processing/ Dynamics of Electrical Machines/ Power Apparatus Design | PE | 1,2,3 | a,b,d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 23/ 24/ 25/ 26 |

M.E (Power Systems Engineering) 2019-2020

| | | | | | | | | | | | | |
|--|--|------|-----------|---------------------------------|-----------|----------|----------|-----------|------------|------------|------------|---------------------------------------|
| 19MEPS204 A/B/C/D | Advanced Micro-Controller Based Systems/ SCADA System and Applications/ Power Quality/ Artificial Intelligence Techniques | PE | 1,2,3 | a,b, d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 28/ 29/ 31/ 33 |
| 19MEPS211 A/B/C | Power System Protection Lab/ Power Quality Lab/ Artificial Intelligence Lab/ | PCC | 1,2, 3 | a , b , d , f | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 34 |
| VAC 19MEPS251 A/B/C/D (Audit 2) | Constitution of India/ Pedagogy Studies/ Stress Management by Yoga/ Personality Development through Life Enlightenment Skills | HSMC | 1,2, 3 | a , b , d , f | 0 | 0 | 3 | 2 | 100 | 0 | 100 | |
| Total | | | | | 12 | 0 | 6 | 16 | 300 | 300 | 600 | |
| SEMESTER- III | | | | | | | | | | | | |
| 19MEPS301 A/B/C | Power System Transients/ FACTS and Custom Power Devices/ Industrial Load Modeling and Control | PCC | 1,2,3 | a,b, d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 35/ 36/ 38 |
| 19MEPS302 A/B/C/D/E/F | Business Analytics/ Industrial Safety/ Operations Research/ Cost Management of Engineering Projects/ Composite | OE | 1,2,3 | a,b, d,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 39/ 41/ 43/ 44/ 46/ 48 |

M.E (Power Systems Engineering) 2019-2020

| | | | | | | | | | | | | |
|-----------------------|-------------------------------|-----|--|--|-----------|----------|-----------|-----------|------------|-------------|-------------|--|
| | Materials/ Waste to Energy | | | | | | | | | | | |
| 19MEPS39 1 | Phase – I Dissertation | PCC | | | 0 | 0 | 9 | 10 | 40 | 60 | 100 | |
| Total | | | | | 6 | 0 | 9 | 16 | 120 | 180 | 300 | |
| SEMESTER -IV | | | | | | | | | | | | |
| 19MEPS491 | Phase-II Dissertation | PCC | | | 0 | 0 | 18 | 12 | 120 | 180 | 300 | |
| Total | | | | | 0 | 0 | 18 | 12 | 120 | 180 | 300 | |
| Program Total | | | | | 33 | 0 | 42 | 64 | 920 | 1080 | 2000 | |

L: Lecture Hour **T:** Tutorial Hour **CIA:** Continuous Internal Assessment

P: Practical Hour **C:**No. of Credits **ESE:** End Semester Examinations

PCC – Programme Core Course **PE** - Program Elective

OE – Open Elective **HSMC**-Humanities, Social Science and Management Course

****--Skill Development**

****--Employability**

****--Entrepreneurship**

Program Outcomes:

On successful completion of the programme,

- a. Graduates will be able to demonstrate the principles and practices of the electrical power industry regarding generation, transmission, distribution and electrical machines and their controls.
- b. Graduates will be able to apply their knowledge of electrical power principles, as well as mathematics and scientific principles, to new applications in electrical power.
- c. Graduates will be able to perform, analyze, and apply the results of experiments to electrical power application improvements.
- d. Graduates will be able to look at all options in design and development projects and creativity and choose the most appropriate option for the current project.
- e. Graduates will function effectively as a member of a project team.
- f. Graduates will be able to identify problems in electrical power systems, analyze the problems, and solve them using all of the required and available resources.
- g. Graduates will be able to effectively communicate technical project information in writing or in personal presentation and conversation.
- h. Graduates will be engaged in continuously learning the new practices, principles, and techniques of the electrical power industry.
- i. Graduates will work on application software packages for power system analysis and design.
- j. Graduates will develop indigenous software packages for power system planning and operational problems of utilities.

Program Specific Outcomes (PSOs)

- k. Graduates will be able to demonstrate the principles and practices of the electrical power industry regarding generation, transmission, distribution and electrical machines and their controls.
- l. Graduates will be able to apply their knowledge of electrical power principles, as well as mathematics and scientific principles, to new applications in electrical power.
- m. Graduates will be engaged in continuously learning the new practices, principles, and techniques of the electrical power industry.

Programme Educational Objectives (PEOs)

PEO 1: To prepare the students to have career in the electrical power Industry/research organization/teaching.

PEO 2: To provide good foundation in mathematics and computational technology to analyze and solve problems encountered in electrical power industry.

PEO 3: Pursue lifelong learning and continuous improvement of their knowledge in the electrical power industry.

PEO 4: To understand the national and global issues related to the electrical power industry and to be considerate of the impact of these issues on the environment and within different cultures.

PEO 5: Apply the highest professional and ethical standards to their activities in the electrical power industry.

PEO 6: To provide the students with knowledge to be involved with the technology advancements and future developments in power generation, control and management as well as with alternate and new energy resources.

M.E (Power Systems Engineering) 2019-2020

| Program Educational Objective | Program Outcome | | | | | | | | | | | | |
|-------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k | l | m |
| PEO 1 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PEO 2 | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | √ |
| PEO 3 | | | | | | | | √ | | | √ | √ | √ |
| PEO 4 | √ | | √ | √ | | √ | | √ | √ | √ | √ | √ | √ |
| PEO 5 | √ | √ | √ | √ | | √ | | √ | √ | √ | √ | √ | √ |
| PEO 6 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PEO 7 | √ | √ | √ | √ | | √ | | √ | √ | √ | √ | √ | √ |



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS
ENGINEERING
FACULTY OF ENGINEERING
PG PROGRAM (CBCS) – M.E POWER SYSTEMS ENGINEERING
(PART TIME)
(2019–2020 Batch and onwards)**

| Course Code | Name of the Course | Category | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | | Page No. |
|-----------------------|--|----------|--------------------------|------------|--------------------------|---|---|-----------|---------------|-----|-------|-----------|
| | | | PEOs | POs | L | T | P | | CIA | ESE | Total | |
| SEMESTER - I | | | | | | | | | | | | |
| 19PMEPS101 | Power System Analysis | PC C | 1, 2, 3 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 4 |
| 19PMEPS102 | Power System Dynamics-I | PC C | 1, 2, 4 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 5 |
| 19PMEPS103 A/B/C/D | Renewable Energy System/ Smart grids/ High Power Converters/ Wind and Solar Systems | PE | 1, 2, 4 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 6/7/9 /10 |
| Total | | | | | 9 | 0 | 0 | 9 | 120 | 180 | 300 | 9 |
| SEMESTER - II | | | | | | | | | | | | |
| 19PMEPS201 | Digital Protection of Power System | PC C | 1, 2, 3 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 11 |
| 19PMEPS202 | Power System Dynamics-II | PC C | 1, 2, 4 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 12 |

| | | | | | | | | | | | | |
|------------------------------|--|---------------|---------|------------|----------|----------|----------|-----------|------------|------------|------------|-----------------|
| 19PMEPS203 A/B/C/D | Electrical Power Distribution System/ Mathematical Methods for Power Engineering/ Pulse Width Modulation for PE Converters/ Electric and Hybrid Vehicles | PE | 1, 2, 4 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 13/14/ 15/16 |
| Total | | | | | 9 | 0 | 0 | 9 | 120 | 180 | 300 | 9 |
| SEMESTER- III | | | | | | | | | | | | |
| 19PMEPS301 A/B/C/D | Restructured Power Systems/Advanced Digital Signal Processing / Dynamics of Electrical Machines/ Power Apparatus Design | PE | 1, 2, 3 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 17/18/ 19/20 |
| 19PMEPS302 A/B/C/D | Advanced Micro-Controller Based Systems/ SCADA System and Applications/ Power Quality/ Artificial Intelligence Techniques | PE | 1, 2, 3 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 22/23/ 25/27 |
| 19PMEPS303 | Research Methodology and IPR | HS M C | 1, 2, 4 | a, b, d | 3 | 0 | 0 | 2 | 40 | 60 | 100 | 28 |
| 19PMEPS311 | Power System Steady State Analysis Lab | PC C | | | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 30 |
| Total | | | | | 9 | 0 | 3 | 10 | 160 | 240 | 400 | |

| SEMESTER IV | | | | | | | | | | | | |
|---------------------------|--|---------|---------------|---------------------|----|---|----|----|-----|------|------|---------------------------------------|
| 19PMEPS401 A/B/C | Power System Transients/ FACTS and Custom Power Devices/Industrial Load Modeling and Control | PC C | 1, 2, 3 | a, b, d, f | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 31/3 2/ 34 |
| 19PMEPS402 A/B/C/D/E/F | Business Analytics/ Industrial Safety/ Operations Research/ Cost Management of Engineering Projects/ Composite Materials/ Waste to Energy | OE | 1, 2, 4 | a, d, f, h | 3 | 0 | 0 | 3 | 40 | 60 | 100 | 36/3 8/ 40/4 1/ 43/4 5 |
| 19PMEPS411 A/B | Power System Dynamics Lab/ Renewable Energy Lab | PC C | | | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 47 |
| Total | | | | | 6 | 0 | 3 | 8 | 120 | 180 | 300 | |
| SEMESTER -V | | | | | | | | | | | | |
| 19PMEPS511 A/B/C/D/E | Power System Protection Lab/Power Quality Lab/Artificial intelligence Lab/Power electronics applications to Power Systems Lab /Smart grids Lab | PCC | | | 0 | 0 | 3 | 2 | 40 | 60 | 100 | 48/4 9 |
| 19PMEPS591 | Project Phase I | | | | 0 | 0 | 9 | 6 | 40 | 60 | 100 | |
| Total | | | | | 0 | 0 | 12 | 8 | 80 | 120 | 200 | |
| SEMESTER -VI | | | | | | | | | | | | |
| 19PMEPS691 | Phase-II Dissertation | PCC | | | 0 | 0 | 18 | 12 | 120 | 180 | 300 | |
| Total | | | | | 0 | 0 | 18 | 12 | 120 | 180 | 300 | |
| Program Total | | | | | 33 | 0 | 36 | 56 | 720 | 1080 | 1800 | |

L: Lecture Hour

T: Tutorial Hour

CIA: Continuous Internal Assessment

P: Practical Hour **C:**No. of Credits **ESE:** End Semester Examinations**PCC** – Programme Core Course **PE** - Program Elective**OE** – Open Elective **HSMC**-Humanities, Social Science and Management Course**** - Skill Development****** - Employability****** - Entrepreneurship****Program Outcomes:**

On successful completion of the programme,

- a. Graduates will be able to demonstrate the principles and practices of the electrical power industry regarding generation, transmission, distribution and electrical machines and their controls.
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- c. Graduates will be able to perform, analyze, and apply the results of experiments to electrical power application improvements.
- d. Graduates will be able to look at all options in design and development projects and creativity and choose the most appropriate option for the current project.
- e. Graduates will function effectively as a member of a project team.
- f. Graduates will be able to identify problems in electrical power systems, analyze the problems, and solve them using all of the required and available resources.
- g. Graduates will be able to effectively communicate technical project information in writing or in personal presentation and conversation.
- h. Graduates will be engaged in continuously learning the new practices, principles, and techniques of the electrical power industry.
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- j. Graduates will develop indigenous software packages for power system planning and operational problems of utilities.

Program Sific Outcomes (PSOs)

- k. Graduates will be able to demonstrate the principles and practices of the electrical power industry regarding generation, transmission, distribution and electrical machines and their controls.
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- m. Graduates will be engaged in continuously learning the new practices, principles, and techniques of the electrical power industry.

Programme Educational Objectives (PEOs)

PEO 1: To prepare the students to have career in the electrical power Industry/research organization/teaching.

PEO 2: To provide good foundation in mathematics and computational technology to analyze and solve problems encountered in electrical power industry.

PEO 3: Pursue lifelong learning and continuous improvement of their knowledge in the electrical power industry.

PEO 4: To understand the national and global issues related to the electrical power industry and to be considerate of the impact of these issues on the environment and within different cultures.

PEO 5: Apply the highest professional and ethical standards to their activities in the electrical power industry.

PEO 6: To provide the students with knowledge to be involved with the technology advancements and future developments in power generation, control and management as well as with alternate and new energy resources.

| Program Educational Objective | Program Outcome | | | | | | | | | |
|-------------------------------|-----------------|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j |
| PEO 1 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PEO 2 | √ | √ | √ | √ | √ | | | √ | √ | √ |
| PEO 3 | | | | | | | | √ | | |
| PEO 4 | √ | | √ | √ | | √ | | √ | √ | √ |
| PEO 5 | √ | √ | √ | √ | | √ | | √ | √ | √ |
| PEO 6 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PEO 7 | √ | √ | √ | √ | | √ | | √ | √ | √ |

| SEMESTER I | | | | | | | | | | |
|-------------|--|-----------------------|--------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME101 | Mathematics-I(Calculus and Linear Algebra for Mechanicaland AutomobileEngineering) | 1 | 1,2,8,9 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEME102 | Electro Magnetism | 1, 3 | 1,2,3,5,8,9 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEME103 | Basic Electrical Engineering | 1, 3 | 1,2,3,8,9,11 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEME311 | Engineering Graphics-I | 1, 2 | 1,2,3,5,9 | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| Total | | | | 10 | 3 | 8 | 17 | 160 | 240 | 400 |

| SEMESTER II | | | | | | | | | | |
|-------------|---|-----------------------|-----------|--------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME201 | Mathematics-II (Calculus, Ordinary Differential Equations and Complex variable for Mechanical and Automobile Engineering) | 1 | 1,2,8,9 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEME202 | Chemistry I | 1 | 1,2,5,10 | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| 19BEME203 | English | 2 | 4,5,10 | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BEME204 | Programming for problem Solving | 1 | 1,2,9 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BEME205 | Constitution of India | | | 1 | - | - | - | 100 | - | 100 |
| 19BEME211 | Workshop / Manufacturing Practice | 1, 2 | 1,2,3,5 | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| 19BEME212 | Engineering Graphics II | 1, 2 | 1,2,3,5,9 | 1 | 0 | 3 | 2 | 40 | 60 | 100 |
| Total | | | | 12 | 2 | 16 | 23 | 340 | 360 | 700 |

| SEMESTER III | | | | | | | | | | |
|-------------------------|--------------------------------------|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME301 | Mathematics III | 1 | 1,3,5,6,7,8 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEME302 | Biology for Engineers | 1 | 1,3,5,6,7,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME303 | Engineering Mechanics | 1 | 1,2,3,4,10,11 | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BEME304 | Thermodynamics | 1 | 1,2,3,4,10 | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BEME341 | Basic Electronics Engineering | 1 | 1,2,3,4,10 | 3 | 0 | 2 | 4 | 40 | 60 | 100 |
| 19BEME311 | Machine Drawing | 1 | 1,2,3,4,10 | 2 | 0 | 3 | 4 | 40 | 60 | 100 |
| 19BEME351 | Aptitude Training | - | - | 1 | 0 | 0 | - | 100 | - | 100 |
| 19BEME352A / 19BEME352B | Welding Process / Welding Metallurgy | - | - | 2 | 0 | 0 | - | 100 | - | 100 |
| 19BEME353 | Material Testing Laboratory | - | - | 0 | 0 | 3 | - | 100 | - | 100 |
| Total | | | | 20 | 3 | 8 | 21 | 540 | 360 | 900 |

| SEMESTER IV | | | | | | | | | | |
|-------------------------|---|-----------------------|------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME401 | Instrumentation & Control systems | 1 | 1,2,3,4,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME402 | Environmental Studies | 1 | 1,2,3,4,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME441 | Engineering Materials and Metallurgy | 1 | 1,2,3,4,10 | 3 | 0 | 2 | 4 | 40 | 60 | 100 |
| 19BEME442 | Applied Thermodynamics | 1 | 1,2,3,4,10 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEME443 | Strength of Materials | 1 | 1,2,3,4,10 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEME444 | Fluid Mechanics & Fluid Machines | 1 | 1,2,3,4,10 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEME451 | Technical Presentation | - | - | 1 | 0 | 0 | - | 100 | - | 100 |
| 19BEME452A / 19BEME452B | Welding Economics and Management / Process Modeling | - | - | 2 | 0 | 0 | - | 100 | - | 100 |
| 19BEME453 | Mini Project I on Welding | - | - | 1 | 0 | 0 | - | 100 | - | 100 |
| Total | | | | 22 | 3 | 8 | 25 | 540 | 360 | 900 |

| SEMESTER V | | | | | | | | | | |
|-------------------------|---|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME501 | Design of Machine Elements | 1 | 1,2,3,4,9 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEME541 | Heat and Mass Transfer | 1 | 1,2,3,4,5 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEME542 | Manufacturing Technology I | 1 | 1,2,3,6,8,9 | 3 | 0 | 2 | 4 | 40 | 60 | 100 |
| 19BEME543 | Theory of Machines | 1 | 1,2,3,4,10 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BE_____ | Open Elective I | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME551 | Essence of Indian Traditional Knowledge | - | - | 1 | 0 | 0 | - | 100 | - | 100 |
| 19BEME552 | Geometrical Dimensioning and Tolerance | 1 | 1,2,3,4,5,8,9 | 1 | 0 | 0 | - | 100 | - | 100 |
| 19BEME553A / 19BEME553B | Welding Application Technology / Repair Welding and Reclamation | - | - | 2 | 0 | 0 | - | 100 | - | 100 |
| 19BEME554 | Welding Process Laboratory | - | - | 0 | 0 | 3 | - | 100 | - | 100 |
| 19BEME555 | Project I (Course Oriented) | - | - | 1 | 0 | 0 | 1 | 100 | - | 100 |
| Total | | | | 20 | 3 | 9 | 22 | 700 | 300 | 1000 |

| SEMESTER VI | | | | | | | | | | |
|-------------------------|---|-----------------------|----------------|--------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME601 | Design of Transmission Systems | 1 | 1,2,3,4,8,9,10 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BEME641 | Manufacturing Technology II | 1 | 1,2,3,6,8,9 | 3 | 0 | 2 | 4 | 40 | 60 | 100 |
| 19BEME642 | Industrial Metrology | 1 | 1,2,3,6,8,9 | 3 | 0 | 2 | 4 | 40 | 60 | 100 |
| 19BEME6E_ | Professional Elective-I | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E_ | Professional Elective-II | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE_ | Open Elective II | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME611 | Computer Aided Modeling and Simulation Laboratory | 1 | 1,2,3,4,5,8,9 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 19BEME651 | Robotics and Automation | 1 | 1,2,3,4,5 | 1 | 0 | 0 | - | 100 | - | 100 |
| 19BEME652A / 19BEME652B | Welding Codes and Standards / Welding Consumables | - | - | 2 | 0 | 0 | - | 100 | - | 100 |
| 19BEME653 | Heat Treatment Laboratory | | | 0 | 0 | 3 | - | 100 | - | 100 |
| 19BEME654 | Mini Project II on Welding | | | 0 | 0 | 1 | - | 100 | - | 100 |
| 19BEME691 | Project II (Mini) | - | - | 1 | 0 | 0 | 1 | 100 | - | 100 |
| Total | | | | 22 | 1 | 11 | 24 | 780 | 420 | 1200 |

| SEMESTER VII | | | | | | | | | | |
|-------------------------|---|-----------------------|---------------|--------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME741 | Automation in Manufacturing | 1 | 1,2,3,4,5,8,9 | 3 | 0 | 2 | 4 | 40 | 60 | 100 |
| 19BEME742 | Computer Aided Engineering | 1 | 1,2,3,4,5,8,9 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BEME7E_ | Professional Elective-III | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E_ | Professional Elective-IV | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E_ | Professional Elective-V | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE_ | Open Elective III | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME751 | Motors and Pumps | - | - | 1 | 0 | 0 | - | 100 | - | 100 |
| 19BEME752A / 19BEME752B | Design Aspects of Welding & Casting / Design of Weldments | - | - | 2 | 0 | 0 | - | 100 | - | 100 |
| 19BEME753 | Welding Simulation Laboratory | - | - | 0 | 0 | 3 | - | 100 | - | 100 |
| 19BEME754 | Mini Project III on Welding | - | - | 0 | 0 | 1 | - | 100 | - | 100 |
| 19BEME791 | Project III | - | - | 0 | 0 | 6 | 3 | 100 | - | 100 |
| Total | | | | 21 | 1 | 14 | 24 | 740 | 360 | 1100 |

| SEMESTER VIII | | | | | | | | | | |
|---------------|--------------------------|-----------------------|----|--------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME8E_ | Professional Elective-VI | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE_ | Open Elective IV | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BE_ | Open Elective V | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME891 | Project IV | - | - | 0 | 0 | 12 | 6 | 100 | 200 | 300 |
| Total | | | | 9 | 0 | 12 | 15 | 220 | 380 | 600 |

PROFESSIONAL ELECTIVE I

| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
|-------------|---|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME6E01 | Emerging Materials | 1,3 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E02 | Renewable Energy Sources | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E03 | Industrial Robotics | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E04 | Advanced I.C. Engines | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E05 | Hydraulics and Pneumatics Power Control | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E06 | Automobile Engineering | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

PROFESSIONAL ELECTIVE II

| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
|-------------|--|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME6E07 | Design of Jigs, Fixtures and Press Tools | 1,3 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E08 | Refrigeration and Air Conditioning | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E09 | Advanced Manufacturing Processes | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E10 | Vibration Analysis and Control | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E11 | Design and Analysis of Experiments | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME6E12 | Hybrid Vehicle Technology | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

PROFESSIONAL ELECTIVE III

| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
|-------------|--|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME7E01 | Design for Manufacture and Assembly | 1,3 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E02 | Computational Fluid Dynamics | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E03 | Power Plant Engineering | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E04 | Energy Conservation Methods and Energy Audit | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E05 | Additive Manufacturing | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E06 | Logistics & Supply Chain Management | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

PROFESSIONAL ELECTIVE IV

| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
|-------------|-----------------------------------|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME7E07 | Gas Dynamics and Jet Propulsion | 1,3 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E08 | Design of Mechatronic Systems | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E09 | Machine Tool Design | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E10 | Computer Integrated Manufacturing | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E11 | Advanced Welding Technology | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E12 | Operation Research | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

PROFESSIONAL ELECTIVE V

| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
|-------------|-------------------------------------|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME7E13 | Manufacture and Inspection of Gears | 1,3 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E14 | Composite Materials | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E15 | Design of HVAC Systems | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E16 | Non Destructive Testing | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E17 | Industrial Safety Engineering | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME7E18 | Surface Engineering | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

PROFESSIONAL ELECTIVE VI

| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
|-------------|--|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME8E01 | Quality Control and Reliability Engineering | 1,3 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME8E02 | Production Planning and Control | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME8E03 | Cogeneration and Waste Heat Recovery Systems | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME8E04 | Industrial Engineering | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME8E05 | Computer Aided Drafting and Cost Estimation | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME8E06 | Total Quality Management | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

COURSES OFFERED BY OTHER DEPARTMENTS

| SCIENCE & HUMANITIES | | | | | | | | | | |
|---|--------------------------------------|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BESHOE01 | Probability and Random Process | 1,3 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE02 | Fuzzy Mathematics | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE03 | Linear Algebra | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE04 | Engineering Acoustics | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE05 | Solid Waste Management | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE06 | Green Chemistry | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE07 | Applied Electrochemistry | 1,2 | 2,3,4,5,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE08 | Industrial Chemistry | 1,2 | 2,3,4,5,14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BESHOE09 | Technical Writing | 1 | 2,3,4,5,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COMPUTER SCIENCE AND ENGINEERING | | | | | | | | | | |
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BECOE01 | Internet Programming | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE02 | Multimedia and Animation | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE03 | PC Hardware and Trouble shooting | 1,2 | 2,3,4,5,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE04 | Java Programming | 1,2 | 2,3,4,5,14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRICAL AND ELECTRONICS ENGINEERING | | | | | | | | | | |
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEEEOE01 | Electric Hybrid Vehicles | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE02 | Energy Management & Energy Auditing | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE03 | Programmable Logic Controller | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE04 | Renewable Energy Resources | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRONICS AND COMMUNICATION ENGINEERING | | | | | | | | | | |
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEECOE01 | Real Time Embedded Systems | 1,3 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE02 | Consumer Electronics | 1,2 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE03 | Neural Networks and its Applications | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE04 | Fuzzy Logic and its Applications | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| BIOTECHNOLOGY | | | | | | | | | | |
|------------------------|--|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTBTOE01 | Bioreactor Design | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | 1,2 | 2,3,4,5,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | 1,2 | 2,3,4,5,14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nano Biotechnology | 1 | 2,3,4,5,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| AUTOMOBILE ENGINEERING | | | | | | | | | | |
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEAEOE01 | Automobile Engineering | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Two and Three Wheelers Technology | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Vehicle Maintenance | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Modern Vehicle Technology | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE05 | Fleet Management | 1,2 | 2,3,4,5,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CIVIL ENGINEERING | | | | | | | | | | |
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BECEOE01 | Housing, Plan and Management | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE02 | Building Services | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE03 | Management of Irrigation Systems | 1 | 2,3,4,5,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE04 | Advanced Construction Technology | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CHEMICAL ENGINEERING | | | | | | | | | | |
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTCEOE01 | Energy Management in Chemical Industries | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE02 | Fertilizer Technology | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE03 | Industrial Wastewater Treatment | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE04 | Solid and Hazardous Waste Management | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| FOOD TECHNOLOGY | | | | | | | | | | |
|--------------------------------------|---|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFTOE01 | Processing of Food Materials | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 1,3 | 1,2,3,7,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COURSES OFFERED TO OTHER DEPARTMENTS | | | | | | | | | | |
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BEME0E01 | Computer Aided Design | 1 | 1,2,3,7,13,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E02 | Industrial Safety and Environment | 1 | 1,2,3,7,9,13 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E03 | Transport Phenomena | 1 | 1,2,3,7,9,14 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E04 | Introduction to Biomechanics | 1 | 1,2,3,7,9,15 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

- Skill Development
- Employability Skill
- Entrepreneurship Skill

Programme Educational Objectives (PEO's)

- 1: Graduates will more conscious about their profession with social awareness and responsibility.
- 2: Graduates will be engineering experts, who would help solve industry's technological problems.
- 3: Graduates will be engineering professionals, consultants or entrepreneurs engaged in technology development.
- 4: Graduates will interact with their peers in other disciplines in industry and society and contribute to the economic growth of the country.

Programme Outcomes (PO's)

- 1: Ability to apply knowledge of mathematics and science in solving engineering problems.
- 2: In-depth knowledge on the fundamental principles, construction and auxiliary systems of mechanical sciences.

- 3:** To understand the principles involved in evaluating the structural, functional and safety requirements of mechanical systems.
- 4:** Hands on knowledge to develop analytical skills for designing and analyzing various mechanical components and processes.
- 5:** To understand and apply appropriate techniques and IT tools for the design and analysis of mechanical systems.
- 6:** Understanding the mechanism of pollutant formation and its control techniques.
- 7:** Understanding of human and ethical responsibilities towards the profession and society.
- 8:** Ability to understand the economics and cost analysis in order to take economically sound decisions.
- 9:** Ability to apply modern techniques and tools necessary for engineering practice with appropriate considerations for public health, safety, cultural and environmental limitations.
- 10:** Understand the impact of engineering solutions in a societal context and to be able to respond effectively to the needs for sustainable development.
- 11:** Function effectively as an individual, and as a member or a leader in diverse teams, and in multi-disciplinary situations.
- 12:** To recognize the need for, and have the ability to engage in independent and lifelong learning.

Programme Specific Outcomes (PSO's)

- 13:** Ability to design a mechanical system, component, or process to meet desired needs of the nation, industries, institutions within realistic constraints such as economic, environmental, social, political, ethical, health care, and safety, manufacturability, and sustainability.
- 14:** Ability to develop and use of software tools and Information Technology for mechanical engineering domain.
- 15:** Ability to perform effectively first level managerial responsibilities for large or medium engineering organizations.

| Programme Educational Objectives | Programme Objectives | | | | | | | | | | | | | | |
|----------------------------------|----------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | |
| 2 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | | ✓ | |
| 3 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | ✓ | | ✓ | |
| 4 | | | | | | | | ✓ | | | ✓ | | | | ✓ |

B.E. MECHANICAL ENGINEERING

CURRICULUM

(2019 AND ONWARDS)

(PART TIME PROGRAMME)

**Department of Mechanical Engineering
FACULTY OF ENGINEERING**



KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

Established Under Section 3 of UGC Act 1956

Pollachi Main Road, Eachanari Post, Coimbatore – 641 021. INDIA

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University Established Under Section 3 of UGC Act, 1956)

Eachanari Post, Coimbatore-641021.Tamilnadu,India.

FACULTY OF ENGINEERING

B.E. (MECHANICAL ENGINEERING – PART TIME)

COURSE OF STUDY AND SCHEME OF EXAMINATION

(2019 Batch Onwards)

SEMESTER I

| SEMESTER I | | | | | | | | | | |
|-------------|--|-----------------------|----------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| THEORY | | | | | | | | | | |
| 19PBEME101 | Engineering Mathematics I | 1 | 1,2,3,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19PBEME102 | Engineering Mechanics | 1 | 1,2,3,4, 10,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME103 | Basic Electrical and Electronics Engineering | 1 | 1,2,3,4, 7,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME104 | Manufacturing Technology | 1 | 1,2,3,6, 8,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PRACTICAL | | | | | | | | | | |
| 19PBEME111 | Computer Aided Design Laboratory | 1 | 1,2,3,4, 5,8,9 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Total | | | | 12 | 1 | 3 | 15 | 200 | 300 | 500 |

SEMESTER II

| SEMESTER II | | | | | | | | | | |
|-------------|--------------------------------------|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| THEORY | | | | | | | | | | |
| 19PBEME201 | Engineering Mathematics II | 1 | 1,2,3,4 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19PBEME202 | Strength of Materials | 1 | 1,2,3,4, 10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME203 | Theory of Machines | 1 | 1,2,3,4, 10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME204 | Fundamentals of Computer Programming | 1,2 | 1,2,3,5, 9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PRACTICAL | | | | | | | | | | |
| 19PBEME211 | Strength of Materials Laboratory | 1 | 1,2,3,4, 10 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Total | | | | 12 | 1 | 3 | 15 | 200 | 300 | 500 |

| SEMESTER III | | | | | | | | | | |
|--------------|--|-----------------------|------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| THEORY | | | | | | | | | | |
| 19PBEME301 | Thermodynamics | 1 | 1,2,3,4,10 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19PBEME302 | Engineering Materials and Metallurgy | 1 | 1,2,3,4,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME303 | Industrial Metrology | 1 | 1,2,3,4,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME304 | Fluid Mechanics & Fluid Machines | 1 | 1,2,3,4,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PRACTICAL | | | | | | | | | | |
| 19PBEME311 | Fluid Mechanics and Metrology Laboratory | 1 | 1,2,3,4,10 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Total | | | | 12 | 1 | 3 | 15 | 200 | 300 | 500 |

| SEMESTER IV | | | | | | | | | | |
|-------------|--------------------------------|-----------------------|----------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| THEORY | | | | | | | | | | |
| 19PBEME401 | Applied Thermodynamics | 1 | 1,2,3,4,10 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19PBEME402 | Design of Mechatronic Systems | 1,2 | 1,2,3,5,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME403 | Design of Machine Elements | 1 | 1,2,3,4,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME404 | Environmental Science | 1 | 1,2,6,7,8,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PRACTICAL | | | | | | | | | | |
| 19PBEME411 | Thermal Engineering Laboratory | 1 | 1,2,3,4,10 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Total | | | | 12 | 1 | 3 | 15 | 200 | 300 | 500 |

| SEMESTER V | | | | | | | | | | |
|-------------|---|-----------------------|----------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| THEORY | | | | | | | | | | |
| 19PBEME501 | Heat and Mass Transfer | 1 | 1,2,3,4,5 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19PBEME502 | Operations Research | 1,3 | 1,4,7,8,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME503 | Design of Transmission Systems | 1 | 1,2,3,4,8,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME5E- | Professional Elective - I | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PRACTICAL | | | | | | | | | | |
| 19PBEME511 | Computer Aided Manufacturing Laboratory | 1 | 1,2,3,4,5,8,9 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Total | | | | 12 | 1 | 3 | 15 | 200 | 300 | 500 |

| SEMESTER VI | | | | | | | | | | |
|-------------|--|-----------------------|----------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| THEORY | | | | | | | | | | |
| 19PBEME601 | Engineering Economics and Financial Management | 1,3 | 1,2,6,7,8,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME602 | Automation in Manufacturing | 1 | 1,2,3,4,5,8,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E- | Professional Elective - II | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E- | Professional Elective - III | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PRACTICAL | | | | | | | | | | |
| 19PBEME611 | Computer Aided Analysis Laboratory | 1 | 1,2,3,4,5,8,9 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Total | | | | 12 | 0 | 3 | 14 | 200 | 300 | 500 |

| SEMESTER VII | | | | | | | | | | |
|--------------|----------------------------|-----------------------|----------------------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| THEORY | | | | | | | | | | |
| 19PBEME701 | Total Quality Management | 1,3 | 1,2,6,7,8,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E- | Professional Elective - IV | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E- | Professional Elective - V | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| PRACTICAL | | | | | | | | | | |
| 19PBEME791 | Project Work and Viva Voce | 1,2,3 | 1,2,3,4,5,6,7,8,9,10,11,12 | 0 | 0 | 9 | 6 | 40 | 60 | 100 |
| Total | | | | 9 | 0 | 9 | 15 | 160 | 240 | 400 |

| PROFESSIONAL ELECTIVE I | | | | | | | | | | |
|-------------------------|---|-----------------------|-----------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19PBEME5E01 | Emerging Materials | 1 | 1,2,3,4,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME5E02 | Renewable Energy Sources | 1 | 1,2,3,4,6,7,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME5E03 | Advanced I.C. Engines | 1 | 1,2,3,4,6,7,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME5E04 | Hydraulics and Pneumatics Power Control | 1 | 1,2,3,4,9,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME5E05 | Automobile Engineering | 1 | 1,2,3,4,6,7,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| PROFESSIONAL ELECTIVE II | | | | | | | | | | |
|--------------------------|--|-----------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19PBEME6E01 | Design of Jigs, Fixtures and Press Tools | 1 | 1,2,3,4,6,7,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E02 | Refrigeration and Air Conditioning | 1 | 1,2,3,4,8 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E03 | Advanced Manufacturing Processes | 1 | 1,2,3,4,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E04 | Design and Analysis of Experiments | 1 | 1,2,3,4,5,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E05 | Hybrid Vehicle Technology | 1 | 1,2,3,4,5,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| PROFESSIONAL ELECTIVE III | | | | | | | | | | |
|---------------------------|-------------------------------------|-----------------------|----------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19PBEME6E06 | Design for Manufacture and Assembly | 1 | 1,2,3,5,6,8,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E07 | Computational Fluid Dynamics | 1 | 1,2,3,4,5,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E08 | Power Plant Engineering | 1 | 2,3,4,6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E09 | Additive Manufacturing | 1 | 1,2,3,4,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME6E10 | Logistics & Supply Chain Management | 1,3 | 1,2,6,7,8,9,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| PROFESSIONAL ELECTIVE IV | | | | | | | | | | |
|--------------------------|-----------------------------------|-----------------------|------------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19PBEME7E01 | Gas Dynamics and Jet Propulsion | 1 | 1,2,3,4,10,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E02 | Production Planning and Control | 1,3 | 1,2,3,5,7,8,9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E03 | Machine Tool Design | 1 | 1,2,3,5,6,8,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E04 | Computer Integrated Manufacturing | 1,2 | 5,9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E05 | Advanced Welding Technology | 1 | 1,2,3,4,6,7,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| PROFESSIONAL ELECTIVE V | | | | | | | | | | |
|-------------------------|---|-----------------------|--------------------|--------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course title | Objectives & Outcomes | | Instruction Hours / Week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19PBEME7E06 | Composite Materials | 1 | 1,2,3,5,6,8,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E07 | Quality Control and Reliability Engineering | 1,3 | 1,3,4,7,9,11 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E08 | Non Destructive Testing | 1 | 1,2,3,4,6,7,8,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E09 | Industrial Safety Engineering | 1,3 | 1,2,3,4,6,7,8,9,10 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19PBEME7E10 | Industrial Robotics | 1 | 1,2,3,4,6,7,9 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

 Skill Development

 Employability Skill

 Entrepreneurship Skill

Programme Educational Objectives (PEO's)

- **1:** Graduates will more conscious about their profession with social awareness and responsibility.
- **2:** Graduates will be engineering experts, who would help solve industry's technological problems.
- **3:** Graduates will be engineering professionals, consultants or entrepreneurs engaged in technology development.
- **4:** Graduates will interact with their peers in other disciplines in industry and society and contribute to the economic growth of the country.

Programme Outcomes (PO's)

- **1:** Ability to apply knowledge of mathematics and science in solving engineering problems.
- **2:** In-depth knowledge on the fundamental principles, construction and auxiliary systems of mechanical sciences.
- **3:** To understand the principles involved in evaluating the structural, functional and safety requirements of mechanical systems.
- **4:** Hands on knowledge to develop analytical skills for designing and analyzing various mechanical components and processes.
- **5:** To understand and apply appropriate techniques and IT tools for the design and analysis of mechanical systems.
- **6:** Understanding the mechanism of pollutant formation and its control techniques.
- **7:** Understanding of human and ethical responsibilities towards the profession and society.
- **8:** Ability to understand the economics and cost analysis in order to take economically sound decisions.
- **9:** Ability to apply modern techniques and tools necessary for engineering practice with appropriate considerations for public health, safety, cultural and environmental limitations.
- **10:** Understand the impact of engineering solutions in a societal context and to be able to respond effectively to the needs for sustainable development.
- **11:** Function effectively as an individual, and as a member or a leader in diverse teams, and in multi-disciplinary situations.
- **12:** To recognize the need for, and have the ability to engage in independent and lifelong learning.

Programme Specific Outcomes (PSO's)

- **13:** Ability to design a mechanical system, component, or process to meet desired needs of the nation, industries, institutions within realistic constraints such as economic, environmental, social, political, ethical, health care, and safety, manufacturability, and sustainability.
- **14:** Ability to develop and use of software tools and Information Technology for mechanical engineering domain.
- **15:** Ability to perform effectively first level managerial responsibilities for large or medium engineering organizations.

| Programme Educational Objectives | Programme Objectives | | | | | | | | | | | | | | |
|----------------------------------|----------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | |
| 2 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | | ✓ | |
| 3 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | ✓ | | ✓ | |
| 4 | | | | | | | | ✓ | | | ✓ | | | | ✓ |

Total number of credits: 104

L: Lecture Hour

T: Tutorial Hour

CIA: Continuous Internal Assessment

P: Practical Hour

C: No. of Credits

ESE: End Semester Examinations

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University Established Under Section 3 of UGC Act 1956)
FACULTY OF ENGINEERING
B.Tech (BIOTECHNOLOGY)
COURSE OF STUDY AND SCHEME OF EXAMINATION
(2019 BATCH ONWARDS)

2019 – 2020 BATCH

| SEMESTER I | | | | | | | | | | |
|-------------|---------------------------------|-----------------------|-------------------|------------------------|---|----|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTBT101 | Mathematics-I | 2,3 | a,b,e,h,I,m | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTBT141 | Chemistry-I | 2,3 | a,b,c,d,e,f,i,k,m | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| 19BTBT142 | Basic Electrical Engineering | 2,3 | a,b,c,e,i,k,m | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BTBT111 | Engineering Graphics & Design | 2 | a,d,e,m | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 10 | 3 | 9 | 18 | 160 | 240 | 400 |
| SEMESTER II | | | | | | | | | | |
| | | | | | | | | | | |
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTBT201 | Mathematics –II | 2,3 | a,b,e,h,I,m | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTBT202 | English | 1,2,3 | h,i,k,l,m | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BTBT241 | Engineering Physics | 2,3 | a,b,c,e,h,i,k,m | 3 | 1 | 3 | 5 | 40 | 60 | 100 |
| 19BTBT242 | Programming for Problem Solving | 1 | a,b,d,m | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BTBT243 | Biochemistry I | 1,2 | a,b,c,e,m | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| TOTAL | | | | 14 | 3 | 12 | 23 | 200 | 300 | 500 |

| SEMESTER III | | | | | | | | | | |
|--------------|---|-----------------------|-------------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTBT301 | Transforms and partial differential equation | 1,3 | a,b,m | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTBT302 | Cell Biology | 1,3 | a,b,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT303 | Microbiology | 1,3 | a,b,c, g,I,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT304 | Principles of Chemical Engineering | 1,3 | a,b,d,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT305 | Biochemistry II | 1,3 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT341 | Instrumental Methods of analysis | 1,3 | a,b,c, d,m,n | 3 | 0 | 2 | 4 | 40 | 60 | 100 |
| 19BTBT311 | Cell Biology and Microbiology Lab | 1,3 | a,b,c, d,g,m,n | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTBT351 | Constitution of India | 1,2 | h,l,m | 1 | 0 | 0 | - | 100 | - | 100 |
| 19BTBT352 | Synthesis of Organic molecules | 1,3 | a,b,c,f,n | 0 | 0 | 1 | - | 100 | - | 100 |
| TOTAL | | | | 19 | 1 | 7 | 22 | 480 | 420 | 900 |
| SEMESTER IV | | | | | | | | | | |
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTBT401 | Probability and Biostatistics | 1,3 | a,b,m | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTBT402 | Unit operations | 1,3 | a,b,c,d,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT403 | Chemical Thermodynamics | 1,3 | a,b,c,d,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT404 | Basics of Industrial Biotechnology | 1,2,3 | a,b,c,f, g,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT405 | Molecular Biology | 1,3 | a,b,c,d ,e,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT406 | Environmental Studies | 1,3 | f,g,h,l,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT411 | Chemical Engineering Lab | 1,2,3 | a,b,c,d ,f,m,n | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTBT451 | Production of commercially valuable bioproducts | 1,3 | a,f,g,n,o | 0 | 0 | 1 | - | 100 | - | 100 |
| TOTAL | | | | 18 | 1 | 5 | 21 | 380 | 420 | 800 |

| SEMESTER V | | | | | | | | | | |
|-------------|---|-----------------------|-------------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTBT501 | Bioprocess Principles | 1,3 | a,b,c,d,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT502 | Genetic Engineering | 1,2,3 | a,b,c,d,e,f,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT503 | Biopharmaceutical Technology | 1,2,3 | a,b,c,d,f,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT504 | Cancer Biology | 1,3 | a,b,c,d,e,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT541 | Bioinformatics | 1,3 | a,b,c,d,e,m,o | 3 | 0 | 2 | 4 | 40 | 60 | 100 |
| 19BTBT5E-- | Professional Elective I | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT511 | Molecular biology and genetic Engineering lab | 1,2,3 | a,b,c,d,e,f,m,n,o | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTBT551 | Separation of Bioactive compounds from plant material | 1,2 | a,f,g,n,o | 0 | 0 | 1 | - | 100 | - | 100 |
| TOTAL | | | | 18 | 0 | 7 | 21 | 380 | 420 | 800 |
| SEMESTER VI | | | | | | | | | | |
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTBT601 | Mass Transfer Operations | 1,2,3 | a,b,c,d,m,n | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTBT602 | Immunology | 1,3 | a,b,c,d,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT603 | Bioprocess Engineering | 1,2,3 | a,b,c,d,e,f,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT604 | Enzymology & Enzyme technology | 1,3 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19____6E-- | Open Elective I | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E-- | Professional Elective II | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT611 | Immunology Lab | 1,3 | a,b,c,d,n,o | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTBT612 | Bioprocess Lab | 1,2,3 | a,b,c,d,e,f | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTBT651 | Technical Presentation & Seminar | 1,2,3 | i,j,k,l,m,n,o | 0 | 0 | 1 | - | 100 | - | 100 |
| TOTAL | | | | 18 | 1 | 9 | 23 | 420 | 480 | 900 |

Professional Elective - I

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credits | Maximum Marks | | |
|--------------|------------------------------|--------------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – V | | | | | | | | | | |
| 19BTBT5E01 | Environmental Biotechnology | 1,3 | a,b,f,g,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT5E02 | Developmental Biology | 1,3 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT5E03 | Bioorganic Chemistry | 1,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT5E04 | Biomass energy | 1,3 | a,b,c,d,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT5E05 | Molecular Pathogenesis | 1,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT5E06 | Human Anatomy and Physiology | 1 | a,b,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Professional Elective – II & III

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credits | Maximum Marks | | |
|---------------|--|--------------------------|-----------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - VI | | | | | | | | | | |
| 19BTBT6E01 | Recombinant enzyme and therapeutic agents production | 1,2,3 | a,b,c,d,e,f,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E02 | Biological Wastewater Treatment | 1,2,3 | a,b,c,d,f,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E03 | Food Biotechnology | 1,3 | a,b,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E04 | Good Manufacturing Practice | 1,2,3 | f,g,h,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E05 | Nanobiotechnology | 1,3 | a,b,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E06 | IPR and ethical issues in biotechnology | 1,2,3 | f,g,h,I,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E07 | Phytochemicals and Herbal Medicine | 1,3 | a,b,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E08 | Programming in Bioinformatics | 1,3 | a,b,c,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|------------|--|-------|---------------------------|---|---|---|---|----|----|-----|
| 19BTBT6E09 | Industrial safety and Hazards Management | 1,2,3 | f,g,h ,l,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E10 | Plant Biotechnology | 1,3 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E11 | Introduction to Data Analytics | 1,3 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT6E12 | Entrepreneurship in Biotechnology | 1,2,3 | f,g,h ,i,j,k ,l,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Professional Elective - IV

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credits | Maximum Marks | | |
|----------------|-------------------------------|--------------------------|---------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEOs | Pos | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – VII | | | | | | | | | | |
| 19BTBT7E01 | Protein Engineering | 1,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT7E02 | Recombinant DNA technology | 1,3 | a,b,c,d,e,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT7E03 | Molecular Diagnostics | 1,3 | a,b,c,d,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT7E04 | Chemical Reaction Engineering | 1,3 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT7E05 | Immunotechnology | 1,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT7E06 | Animal Biotechnology | 1,2,3 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Professional Elective – V & VI

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credits | Maximum Marks | | |
|-----------------|---------------------------|--------------------------|-------------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - VIII | | | | | | | | | | |
| 19BTBT8E01 | Agriculture Biotechnology | 1,3 | a,b,c,d ,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E02 | Stem cell Technology | 1,2, 3 | a,b,c,d ,e,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|------------|--|-----------|-------------------|---|---|---|---|----|----|-----|
| 19BTBT8E03 | Tissue Engineering | 1,2, 3 | a,b,c,d ,e,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E04 | Marine Biotechnology | 1,3 | a,b,c,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E05 | Genomics and Proteomics | 1,3 | a,b,cd, e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E06 | Structural Biology | 1,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E07 | Clinical Trial and management | 1,2, 3 | a,b,f,g ,h,I,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E08 | Introduction to systems Biology | 1,2, 3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E09 | Genome informatics and Big data analysis | 1,3 | a,b,c,d ,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E10 | Health informatics | 1,2, 3 | a,b,c,d ,e,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E11 | Molecular Modeling | 1,3 | a,b,c,d ,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBT8E12 | Neurobiology and cognitive science | 1,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

OPEN ELECTIVES

COURSES OFFERED BY OTHER DEPARTMENTS

| SUB. CODE | TITLE OF THE COURSE | PEO | PO | L | T | P | C | CIA | ESE | TOTAL |
|---|-------------------------------------|-------|-----------------|---|---|---|---|-----|-----|-------|
| SCIENCE AND HUMANITIES | | | | | | | | | | |
| 19BTSHOE01 | Solid Waste Management | 1,2 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE02 | Green Chemistry | 1,2,3 | a,b,c,d,e,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE03 | Applied Electrochemistry | 2,3 | a,b,c,d,e,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE04 | Industrial Chemistry | 2,3 | a,b,c,d,f,g,I,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE05 | Technical Writing | 2,3 | a,h,i,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE06 | Geophysics | 2,3 | a,b,c,e,k,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE07 | Engineering Acoustics | 2,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE08 | Industrial Mathematics – I | 2,3 | a,b,e,h,i,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE09 | Industrial Mathematics – Ii | 2,3 | a,b,e,h,i,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE10 | Fuzzy Mathematics | 2,3 | a,b,e,h,i,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE11 | Mathematical Physics | 2,3 | a,b,e,h,i,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE12 | Linear Algebra | 2,3 | a,b,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COMPUTER SCIENCE AND ENGINEERING | | | | | | | | | | |
| 19BEC SOE01 | Internet Programming | 2,3 | a,b,c,d,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE02 | Multimedia and Animation | 2,3 | a,b,c,d,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE03 | PC Hardware and Trouble shooting | 2,3 | a,b,c,d,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE04 | Java Programming | 2,3 | a,b,c,d,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRICAL AND ELECTRONICS ENGINEERING | | | | | | | | | | |
| 19BEEEOE01 | Electric Hybrid Vehicle | 2 | a,b,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE02 | Energy Management & Energy Auditing | 2 | a,b,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE03 | Programmable Logic Controller | 2 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE04 | Renewable Energy Resources | 1,2 | a,b,c,e,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

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|--|--|
| ELECTRONICS AND COMMUNICATION ENGINEERING | |
|--|--|

| | | | | | | | | | | |
|------------|--------------------------------------|---|-------|---|---|---|---|----|----|-----|
| 19BEECOE01 | Real Time Embedded Systems | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE02 | Consumer Electronics | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE03 | Neural Networks and its Applications | 1 | a,b,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE04 | Fuzzy Logic and its Applications | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

AUTOMOBILE ENGINEERING

| | | | | | | | | | | |
|------------|----------------------------------|---|-----|---|---|---|---|----|----|-----|
| 19BEAEOE01 | Automobile Engineering | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Two And Three Wheeler Technology | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Vehicle Maintenance | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Modern Vehicle Technology | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

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|--------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
| CIVIL ENGINEERING | | | | | | | | | | | | |
|--------------------------|--|--|--|--|--|--|--|--|--|--|--|--|

| | | | | | | | | | | |
|-----------|--|-----|-----------|---|---|---|---|----|----|-----|
| 19BECOE01 | Housing Plan And Management | 1 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE02 | Building Services | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE03 | Repair And Rehabilitation Of Structures | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE04 | Computer Aided Civil Engineering Drawing | 1,3 | a,b,e,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

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|-------------------------------|--|--|--|--|--|--|--|--|--|
| MECHANICAL ENGINEERING | | | | | | | | | |
|-------------------------------|--|--|--|--|--|--|--|--|--|

| | | | | | | | | | | |
|-------------|-----------------------------------|-----|-----------------|---|---|---|---|----|----|-----|
| 19BEMEEOE01 | Computer Aided Design | 1,3 | a,b,e,m, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE02 | Industrial Safety and Environment | 1,3 | a,b,c,f,g, m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE03 | Transport Phenomena | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE04 | Introduction to Biomechanics | 1,3 | a,b,c,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

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|-----------------------------|--|--|--|--|--|--|--|--|--|
| CHEMICAL ENGINEERING | | | | | | | | | |
|-----------------------------|--|--|--|--|--|--|--|--|--|

| | | | | | | | | | | |
|-----------|--|-------|-----------------|---|---|---|---|----|----|-----|
| 19BTCEO01 | Energy management in chemical industries | 1,3 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEO02 | Fertilizer technology | 1,3 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEO03 | Industrial wastewater treatment | 1,2,3 | a,b,c,d,f,g,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEO04 | Solid and hazardous waste management | 1,2,3 | a,b,c,d,f,g,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

FOOD TECHNOLOGY

| | | | | | | | | | | |
|-------------------------------|---|-------|---------------|---|---|---|---|----|----|-----|
| 19BTFTOE01 | Processing of Food Materials | 1,3 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 1,3 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 1,3 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 1,3 | a,b,c,d,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOMEDICAL ENGINEERING | | | | | | | | | | |
| 19BEBMEOE01 | Robotics In Medicine | 1 | a,b,c,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOE02 | Virtual Reality And Augmented Reality | 1 | a,b,c,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBMEOE03 | Artificial Organs And Implants | 1,3 | a,b,c,e,h,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOTECHNOLOGY | | | | | | | | | | |
| 19BTBTOE01 | Bioreactor Design | 1,2,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | 1 | a,b,c,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | 1,3 | a,b,c,d,e,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nanobiotechnology | 1,3 | a,b,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Note:

- Blue font represents Employability courses
- Green font represents Entrepreneurship courses
- Red font represents Skill development courses

Department of Biotechnology

B.TECH BIOTECHNOLOGY

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

1. Acquire vast knowledge in biotechnology, groom with technical inputs and professionally strong to meet the competency and contribute in research and pursue higher education.
2. Effectively design, implement and improve the challenging issues and serve as an interface to build or lead cross-functional teams, upholding the responsibilities and confer ethical commitment.
3. Benchmark the significance of Biotechnology in lifelong learning thereby contributing to the core domain, exhibit professionalism and to address the societal issues for sustainable development.

PROGRAM OUTCOME (PO)

The graduates of Biotechnology (B.Tech) will be able to

- a. **Engineering Knowledge:** Apply knowledge of mathematics, basic sciences and Engineering fundamentals that forms the basics of biotechnology and serves as solutions for intricate engineering problems.
- b. **Problem Analysis:** Utilizing principles of mathematics, basic sciences and Engineering fundamentals to identify, analyze and formulate solutions for the engineering problems.
- c. **Design/development of solutions:** Design an integrated system with appropriate considerations to develop solutions for complex engineering problems, public health and safety, cultural and societal benefits.
- d. **Conduct investigations of complex problems:** Conduct investigations by implementing research knowledge and research oriented techniques inclusive of experimental designs, analysis and data interpretation to produce valid information to solve complex problems.
- e. **Modern tool usage:** Formulate and apply relevant research tools, IT and contemporary engineering tools to significantly provide solutions for engineering problems thereby understanding the complexity.

- f. **The engineer and the society:** Understand the process of harnessing value based bio-products which help in serving the society and demonstrate the need to address the safety, legal and cultural issues.
- g. **Environment and sustainability:** Impart professional engineering solutions for sustainable environmental development.
- h. **Ethics:** Apply and understand the ethical principles to commit oneself to professional ethics and behold the engineering practices and responsibilities.
- i. **Individual and team work:** Cultivate the efficiency to work individually, in a team and to participate in multidisciplinary settings.
- j. **Communication:** Communicate the engineering concepts in the engineering society with an effectiveness to design, formulate, interpret data and documentation, to efficiently deliver presentations and make appropriate reports with apparent information.
- k. **Project management and finance:** Demonstrate the knowledge in order to manage projects, lead a team and perform multi tasks in a challenging environment.
- l. **Lifelong learning:** Distinguish the importance of the concepts to engage in enduring learning with suitable technological changes.

PROGRAMME SPECIFIC OUTCOMES (PSO)

At the end of the B.Tech Biotechnology program, the graduates will be able to

- m. Acquire a strong knowledge in biological sciences and chemical engineering subjects relevant to biotechnology.
- n. Apply skills of biotechnology to design and develop products, process and techniques for medical, food and environmental sectors.
- o. Innovate new ideas and to design practical solutions to mitigate the challenges in the society.

PEO – PO & PSO Mapping

| | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ |
| PEO2 | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| PEO3 | | ✓ | ✓ | | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ |

FACULTY OF ENGINEERING
DEGREE OF BACHELOR OF TECHNOLOGY IN
CHEMICAL ENGINEERING
DEPARTMENT OF CHEMICAL ENGINEERING
(REGULAR PROGRAMME)
CURRICULUM AND SYLLABI
(2019 – 2020)



KARPAGAM ACADEMY OF HIGHER EDUCATION
Faculty of Engineering
Department of Chemical Engineering
(Deemed University Established Under Section 3 of
UGC Act 1856) Pollachi Main Road, Eachanari
Post, Coimbatore- 641 021, India.

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University Established Under Section 3 of UGC Act 1856)

FACULTY OF ENGINEERING

B.Tech (CHEMICAL ENGINEERING)

COURSE OF STUDY AND SCHEME OF EXAMINATION (2019 BATCH ONWARDS)

| SEMESTER I | | | | | | | | | | |
|-------------|--|-----------------------|-------------------|------------------------|---|---|---------|---------------|-----|-------|
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTCE101 | Mathematics-I | 3 | 1,2,4,8,11 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE102 | Physics | 2,3 | 1,2,5,6,8,10,11 | 3 | 1 | 3 | 5 | 40 | 60 | 100 |
| 19BTCE103 | English | 1,2,3 | 9,11 | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BTCE104 | Chemistry-I | 2,3 | 1,2,3,5,6,7,8, 11 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE105 | Engineering Graphics | 1,2 | 1,3 | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| TOTAL | | | | 12 | 3 | 9 | 18 | 200 | 300 | 500 |
| SEMESTER II | | | | | | | | | | |
| Course Code | Course Title | Objectives & Outcomes | | Instruction hours/week | | | Credits | Maximum Marks | | |
| | | PEO | PO | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTCE201 | Mathematics-II | 3 | 1,2,4,8,10 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE202 | Chemistry –II | 2,3 | 1,2,3,5,6,7, 8,11 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE203 | Electrical And Electronics Engineering | 1,2 | 1,2,3,5,6 | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BTCE204 | Thermodynamics-I | 1,2 | 1,3,5,6 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|--------------|---------------------------------|-----|--------------|-----------|----------|----------|-----------|------------|------------|------------|
| 19BTCE205 | Programming for Problem Solving | 1 | 1,2,3 | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BTCE206 | Chemistry Lab | 1,3 | 1,4,6,7,8,11 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| TOTAL | | | | 15 | 4 | 9 | 24 | 240 | 360 | 600 |

DEPARTMENT OF CHEMICAL ENGINEERING
FACULTY OF ENGINEERING
UG PROGRAM (CBCS) – B.Tech – CHEMICAL ENGINEERING (FULL TIME)
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|-------------------------------|--------------------------|---------------------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs&PEOs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – III | | | | | | | | | | |
| 19BTCE301 | Heat Power Engineering | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE302 | Fluid Mechanics | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE303 | Chemical Process Calculations | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE304 | Mechanical Operations | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE305 | Thermodynamics – II | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|---|-----|--|-----------|----------|-----------|-----------|------------|------------|-------------|
| 19BTCE311 | Engineering Workshop | 1,2 | 1,2,3,4, 5,6,7,8, 9,10,11, 12 | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| Semester Total | | | | 16 | 5 | 4 | 23 | 240 | 360 | 600 |
| SEMESTER – IV | | | | | | | | | | |
| 19BTCE401 | Heat Transfer | 1,2 | 1,2,3,4, 5,6,7,11 ,12 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE402 | Mass Transfer-I | 1,2 | 1,2,3,4, 5,6,7,11 ,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE403 | Chemical Process Industries | 1,2 | 1,2,3,4, 5,6,7,11 ,12 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE404 | Materials Technology | 1,2 | 1,2,3,4, 5,6,7,11 ,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE405 | HASS – II (Engineering Economics and Financial Management) | 1,2 | 1,2,3,4, 5,6,7,11 ,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE406 | Environmental Science | 1,2 | 1,2,3,4, 5,6,7,11 ,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE411 | Numerical Methods in Chemical Engineering | 1,2 | 1,2,3,4, 5,6,7,8, 9,10,11, 12 | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BTCE412 | Unit Operations Lab – I (Fluid Mechanics and Mechanical Operations lab) | 1,2 | 1,2,3,4, 5,6,7,11 ,12 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| Semester Total | | | | 20 | 2 | 6 | 25 | 320 | 480 | 800 |
| Program Total | | | | 36 | 7 | 10 | 48 | 580 | 720 | 1300 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------------|--|--------------------------|-----------------------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs&PEOs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER – V | | | | | | | | | | |
| 19BTCE501 | Chemical Reaction Engineering – I | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTCE502 | Mass Transfer-II | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE5PE1 | Core Elective- I | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE5OE | Open Elective-I | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE504 | HASS- III (Professional Ethics in Engineering) | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE505 | Process Modelling and Simulation | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE511 | Unit Operations Laboratory – II (Heat &Mass Transfer Laboratory) | 1,2 | 1,2,3,4,5,6,7,11,12 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTCE512 | Constitution of India / Essence of Indian knowledge Tradition | 1,2 | 1,2,3,4,5,6,8,7,11,12 | 0 | 0 | 0 | 0 | 100 | 0 | 100 |
| Semester Total | | | | 18 | 1 | 4 | 24 | 380 | 420 | 800 |
| SEMESTER – VI | | | | | | | | | | |
| 19BTCE601 | Chemical Reaction Engineering – II | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE602 | Process Economics | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE6PE2 | Professional Core Elective – II | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE603 | Process Control | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-----------------------|--|-----|----------------------------|-----------|----------|----------|-----------|------------|------------|-------------|
| 19BTCE604 | HASS – IV (Principles of Management) | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE6OE | Open Elective – II | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE611 | Chemical Reaction Engineering Laboratory | 1,2 | 1,2,3,4,5,6,7,8,9,10,11,12 | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTCE612 | Internship | | 1,2,3,4,5,6,7,8,10,11,12 | 0 | 0 | 0 | 0 | 100 | 0 | 100 |
| Semester Total | | | | 18 | 0 | 4 | 20 | 380 | 420 | 800 |
| Program Total | | | | 36 | 1 | 8 | 44 | 760 | 840 | 1600 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|-------------|--------------------|--------------------------|----------|--------------------------|---|---|-----------|---------------|-----|-------|
| | | PEOs | POs&PSOs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |

SEMESTER – VII

| | | | | | | | | | | |
|------------|----------------------------------|-----|---------------------|---|---|---|---|----|----|-----|
| 19BTCE701 | Transport Phenomena | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE7PE3 | Professional Core Elective – 3 | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE7PE4 | Professional Core Elective -4 | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE7OE | Open Elective-3 | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE7OE | Open Elective-4 | 1,2 | 1,2,3,4,5,6,7,11,12 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE711 | Design and Simulation Laboratory | 1,2 | 1,2,3,4,5,6,7,8, | 1 | 0 | 4 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|------------------------|---|-----|--|----|---|--------|----|--------|-------------|-------------|
| | | | 9,10,11, 12 | | | | | | | |
| 19BTCE712 | Instrumentation and control Laboratory | 1,2 | 1,2,3,4, 5,6,7,8, 9,10,11, 12 | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| 19BTCE761 | Project Stage-I | 1,2 | 1,2,3,4, 5,6,7,8, 9,10,11, 12 | 0 | 0 | 6 | 3 | 8 0 | 1 2 0 | 2 0 0 |
| Semester Total | | | | 14 | 0 | 1 4 | 24 | 360 | 540 | 900 |
| SEMESTER – VIII | | | | | | | | | | |
| 19BTCE801 | Project Stage-II | 1,2 | 1,2,3,4, 5,6,7,8, 9,10,11, 12 | - | - | - | 12 | 40 | 60 | 100 |
| Semester Total | | | | 0 | 0 | 0 | 12 | 40 | 60 | 100 |
| Program Total | | | | 14 | 0 | 14 | 36 | 400 | 600 | 1000 |

TOTAL CREDITS = 152

LIST OF PROFESSIONAL ELECTIVES

| S. No | Course Code | Course Title | L | T | P | C |
|-------|-------------|-------------------------------------|---|---|---|---|
| 1. | 19BTCEPE1 | Water Conservation and Management | 3 | 0 | 0 | 3 |
| 2. | 19BTCEPE2 | Sustainability Engineering | 3 | 0 | 0 | 3 |
| 3. | 19BTCEPE3 | Interfacial Engineering | 3 | 0 | 0 | 3 |
| 4. | 19BTCEPE4 | Nanoscience and Nanotechnology | 3 | 0 | 0 | 3 |
| 5. | 19BTCEPE5 | Advanced Separation Processes | 3 | 0 | 0 | 3 |
| 6 | 19BTCEPE6 | Polymer Science and Engineering | 3 | 0 | 0 | 3 |
| 7 | 19BTCEPE7 | Environmental Pollution and Control | 3 | 0 | 0 | 3 |
| 8 | 19BTCEPE8 | Renewable Energy | 3 | 0 | 0 | 3 |
| 9 | 19BTCEPE9 | Optimization Methods | 3 | 0 | 0 | 3 |

LIST OF OPEN ELECTIVES

COURSE OFFERED BY OTHER DEPARTMENT

| SUB. CODE | TITLE OF THE COURSE | L | T | P | C | CIA | ESE | TOTAL |
|----------------------------------|---------------------------|---|---|---|---|-----|-----|-------|
| SCIENCE AND HUMANITIES | | | | | | | | |
| 19BTSHOE01 | Solid Waste Management | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE02 | Green Chemistry | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE03 | Applied Electrochemistry | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE04 | Industrial Chemistry | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE05 | Technical writing | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE06 | Geophysics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE07 | Engineering Acoustics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE08 | Industrial Mathematics I | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE09 | Industrial Mathematics II | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE10 | Fuzzy Mathematics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE11 | Mathematical Physics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE12 | Linear Algebra | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COMPUTER SCIENCE AND ENGINEERING | | | | | | | | |

| | | | | | | | | |
|--|---|---|---|---|---|----|----|-----|
| 19BEC SOE01 | Internet Programming | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE02 | Multimedia and Animation | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE03 | PC Hardware and Trouble shooting | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEC SOE04 | Java Programming | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRICAL AND ELECTRONICS ENGINEERING | | | | | | | | |
| 19BEEEOE01 | Electric Hybrid Vehicles | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE02 | Energy Management & Energy Auditing | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE03 | Programmable Logic Controller | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE04 | Renewable Energy Resources | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRONICS AND COMMUNICATION ENGINEERING | | | | | | | | |
| 19BEECOE01 | Real Time Embedded Systems | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE02 | Consumer Electronics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE03 | Neural Networks and its Applications | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE04 | Fuzzy Logic and its Applications | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE05 | Principles of Modern Communication System | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| AUTOMOBILE ENGINEERING | | | | | | | | |
| 19BEAEOE01 | Automobile Engineering | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Basics of Two and Three Wheelers | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Automobile Maintenance | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Introduction to Modern Vehicle Technology | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CIVIL ENGINEERING | | | | | | | | |
| 19BECEOE01 | Housing, Plan and Management | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE02 | Building Services | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE03 | Repair and Rehabilitation of Structures | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE04 | Computer Aided Civil Engineering Drawing | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| MECHANICAL ENGINEERING | | | | | | | | |
| 19BEMEEOE01 | Computer Aided Design | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEEOE02 | Industrial Safety and Environment | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

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|-------------------------------|---|---|---|---|---|----|----|-----|
| 19BEMEOE03 | Transport Phenomena | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEMEOE04 | Introduction to Biomechanics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CHEMICAL ENGINEERING | | | | | | | | |
| 19BTCEOE01 | Energy Management in Chemical Industries | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE02 | Fertilizer Technology | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE03 | Industrial wastewater treatment | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCEOE04 | Solid and Hazardous waste management | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOTECHNOLOGY | | | | | | | | |
| 19BTBTOE01 | Bioreactor Design | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of nano biotechnology | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| FOOD TECHNOLOGY | | | | | | | | |
| 19BTFTOE01 | Processing of Food Materials | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| AUTOMOBILE ENGINEERING | | | | | | | | |
| 19BEAEOE01 | Automobile Engineering | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Basics of Two and Three Wheelers | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Automobile Maintenance | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Introduction to Modern Vehicle Technology | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

PROGRAM OUTCOMES: On successful completion of the programme,

| | |
|----|---|
| 1 | Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems |
| 2 | Problem analysis: Identify, formulate, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences |
| 3 | Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations |
| 4 | Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions |
| 5 | Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern Engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations. |
| 6 | The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice |
| 7 | Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development |
| 8 | Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice |
| 9 | Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings |
| 10 | Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions |
| 11 | Project management and finance: Demonstrate knowledge and understanding of the Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments |
| 12 | Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change |

PROGRAM SPECIFIC OUTCOMES:

| | |
|-----------|---|
| 13 | Graduates will apply knowledge in physics, chemistry and biology in the field of transfer processes for effective separation and purification of petrochemicals, pharmaceuticals and health care products |
| 14 | Graduates will automate and control processes by applying mathematics, process control, instrumentation, simulation and process modeling |

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

| | |
|--------------|--|
| PEO 1 | Graduates pursue profession in chemical & allied engineering |
| PEO 2 | Graduates will pursue higher education & research |

MAPPING:

| PEO \ PO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|-----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|
| PEO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PEO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |



Skill Development



Employability Skill



Entrepreneurship Skill

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University Established under Section 3 of UGC Act 1956)
FACULTY OF ENGINEERING
B.Tech (FOOD TECHNOLOGY)
COURSE OF STUDY AND SCHEME OF EXAMINATION
(2019 BATCH ONWARDS)

| SEMESTER I | | | | | | | | | | |
|----------------|--|-----------------------|---------------------------|--------------------------|---|----|---------|---------------|-----|-------|
| Course code | Course Title | Objectives & outcomes | | Instruction hours / week | | | Credits | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFT101 | Mathematics-I | 2,3 | a,b,e,h,k | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTFT141 | Chemistry-I | 3 | a,b,c,e,f,h,k | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| 19BTFT142 | Basic Electrical Engineering | 2,3 | a,b,d,h,k | 3 | 1 | 2 | 5 | 40 | 60 | 100 |
| 19BTFT111 | Engineering Graphics & Design | 1,2 | a,h,i | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| Semester Total | | | | 10 | 3 | 9 | 18 | 160 | 240 | 400 |
| SEMESTER - II | | | | | | | | | | |
| Course code | Course Title | Objectives & outcomes | | Instruction hours / week | | | Credits | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFT201 | Mathematics-II | 2,3 | a, b, e, h, k | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTFT202 | English | 3 | i, j, k | 2 | 0 | 2 | 3 | 40 | 60 | 100 |
| 19BTFT241 | Engineering Physics | 2,3 | a,c,e,h,k | 3 | 1 | 3 | 5 | 40 | 60 | 100 |
| 19BTFT242 | Programming for problem solving | 1 | a, b, c | 3 | 0 | 4 | 5 | 40 | 60 | 100 |
| 19BTFT243 | Food Chemistry | 1,2 | a, b, f, m | 3 | 1 | 3 | 6 | 40 | 60 | 100 |
| Semester Total | | | | 14 | 3 | 12 | 23 | 200 | 300 | 500 |
| SEMESTER - III | | | | | | | | | | |
| Course code | Course Title | Objectives & outcomes | | Instruction hours / week | | | Credits | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFT301 | Mathematical Transforms and Partial differential Equations | 1,2 | a, b | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTFT302 | Fluid Mechanics | 1,2 | a, b, c, d, e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT303 | Food Microbiology | 1,2 | a, d, f, l, m, n | 2 | 1 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT304 | Food Process Calculations | 1,2,3 | a, b, c, d, e, f, l, m, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| 19BTFT305 | Thermodynamics | 1,2 | a, b, c, d, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
|----------------------|---|-----------------------|------------------------------|--------------------------|---|---|---------|---------------|-----|-------|
| 19BTFT306 | Food Biochemistry and Human Nutrition | 1,2 | a, b, h, l, m, n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT311 | Food Microbiology Laboratory | 1,2,3 | a, d, e, f, i, l, n | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTFT312 | Food Biochemistry Laboratory | 1,2,3 | a, b, d, e, f, i, l, n | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTFT351 | Constitution of India | 3 | h, l | 1 | 0 | 0 | - | 100 | - | 100 |
| TOTAL | | | | 18 | 2 | 8 | 23 | 420 | 480 | 900 |
| SEMESTER – IV | | | | | | | | | | |
| Course code | Course Title | Objectives & outcomes | | Instruction hours / week | | | Credits | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFT401 | Probability and Biostatistics | 1,2 | a, b | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 19BTFT402 | Engineering properties of Food Materials | 1,2 | a, b, c, e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT403 | Heat and Mass Transfer | 1,2 | a, b, d, e | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT404 | Food Analysis | 1,2,3 | a, b, c, d, e, g, l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT405 | Unit Operations in Food Processing | 1,2,3 | a, b, c, d | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT406 | Environmental Studies | 1,2,3 | f, g, h, l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT411 | Food Analysis Laboratory | 1,2 | a, b, c, d, e, g, i, l | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTFT412 | Fluid Mechanics and Heat Transfer Laboratory | 1,2 | a, b, d, e, i | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| TOTAL | | | | 18 | 1 | 8 | 23 | 400 | 480 | 800 |
| SEMESTER - V | | | | | | | | | | |
| Course code | Course Title | Objectives & outcomes | | Instruction hours / week | | | Credits | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFT501 | Bakery and Confectionary Technology | 1,2 | b, d, e, g, l, m, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT502 | Refrigeration, Air conditioning and Cold Storage Construction | 1,2 | a, b, c, d, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT503 | Cereals and Pulses Technology | 1,2 | a, b, c, d, l, m, n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT504 | Meat, Poultry and Fish Processing | 1,2 | a, b, d, e, f, g, m, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT505 | Fruits and Vegetable Processing Technology | 1,2 | a, b, c, d, e, f, g, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT5E- | Professional Elective - I | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| 19BTFT511 | Food Enzymology Laboratory | 1,2 | a, b, d, i, l, n | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
|--|--|------------------------|------------------------------|--------------------------|---|---|---------|---------------|-----|-------|
| 19BTFT512 | Food Product Laboratory - I | 1,2 | a, b, c, d, e, l, n | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTFT551 | Food Industry Waste Management / Byproduct Utilization | 1,2,3 | a-o | 0 | 0 | 1 | - | 100 | - | 100 |
| TOTAL | | | | 18 | 0 | 9 | 22 | 420 | 480 | 900 |
| SEMESTER - VI | | | | | | | | | | |
| Course code | Course Title | Objectives & out comes | | Instruction hours / week | | | Credits | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFT601 | Food Additives | 1,2 | a, b, c, i, k, m, n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT602 | Food Safety Regulations | 1,2 | b, c, d, e, f, g, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT603 | Dairy Technology | 1,2 | a, b, c, d, e, f, g, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE- | Open Elective - I | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E- | Professional Elective - II | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E- | Professional Elective – III | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT611 | Food Product Laboratory-II | 1,2 | a , b, c, d, e, l, n, o | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTFT612 | Food Additives and Quality Control Laboratory | 1,2 | b, c, e, f, i, m, o | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 19BTFT651 | Technical Presentation and Seminar | 1,2,3 | i, j | 0 | 0 | 1 | - | 100 | - | 100 |
| TOTAL | | | | 18 | 0 | 9 | 22 | 420 | 480 | 900 |
| Summer Internship / Mini Project– During Summer Vacation – Non credit course | | | | | | | | | | |
| SEMESTER - VII | | | | | | | | | | |
| Course code | Course Title | Objectives & outcomes | | Instruction hours / week | | | Credits | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFT701 | Professional Ethics, Principles of Management and Entrepreneurship Development | 1,2 | f, g, h, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT702 | Process Economics and Plant Layout Design | 1,2 | a, f, g, k, l, m, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT703 | Food Packaging Technology | 1,2 | a, b, c, d, e, h, l, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE- | Open Elective-II | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT7E- | Professional Elective - IV | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT711 | Food Packaging Laboratory | 1,2 | a, b, c, d, h, i, l, n | 0 | 0 | 4 | 2 | 40 | 60 | 100 |

| 19BTFT791 | Project Work Phase - I | 1,2,3 | a-l | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
|-----------------------|----------------------------|------------------------|-----|--------------------------|---|------------|---------|---------------|-----|-------|
| TOTAL | | | | 15 | 0 | 8 | 19 | 280 | 420 | 700 |
| SEMESTER -VIII | | | | | | | | | | |
| Course code | Course Title | Objectives & out comes | | Instruction hours / week | | | Credits | Maximum Marks | | |
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| 19BTFT8E- | Professional Elective - V | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E- | Professional Elective – VI | - | - | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT891 | Project Work Phase II | 1,2,3 | a-l | 0 | 0 | 18 | 9 | 120 | 180 | 300 |
| TOTAL | | | | 6 | 0 | 18 | 15 | 200 | 300 | 500 |
| TOTAL CREDITS | | | | | | 165 | | | | |

Professional Elective - I

| Course code | Course Title | Objectives & out comes | | Instruction hours / week | | | Credits | Maximum Marks | | |
|-------------|--|------------------------|-------------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| | SEMESTER - V | | | | | | | | | |
| 19BTFT5E01 | Food Preservation Principles | 1,2,3 | a, c, d, l,m,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT5E02 | Beverage Processing Technology | 2,3 | a, b, d, f, g,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT5E03 | Nonthermal Techniques in Food Processing | 1,2 | a, c, d, l,n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT5E04 | Instrumental Analysis of Foods | 1,2 | a, b, d, e,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT5E05 | Production Technology of Fruit Crops | 1,2 | e, g, i, j, l,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT5E06 | Production Technology of Vegetable Crops | 1,2 | e, g, i, j, l,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Professional Elective – II & III

| Course code | Course Title | Objectives & outcomes | | Instruction hours / week | | | Credits | Maximum Marks | | |
|-------------|--|-----------------------|----------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | 40 | 60 | 100 | | | | | | | |
| | SEMESTER - VI | | | | | | | | | |
| 19BTFT6E01 | Radiation Preservation and Processing of Food Products | 1,3 | a, c, d, l,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E02 | Plantation Products and Spice Processing Technology | 2,3 | a, b, d, l,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|------------|--|-------|------------------------------|---|---|---|---|----|----|-----|
| 19BTFT6E03 | Sanitation in Food Industries | 2,3 | b, d, g, i, j, l, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E04 | Industrial Safety and Hazard Analysis | 2,3 | b, d, g, i, j, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E05 | Milling Technology | 2,3 | a, c, e, f, l, m, n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E06 | Technology of Legumes and Oilseed Processing | 1,3 | a, b, c, d, l, m, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E07 | Milk and Milk Products Technology | 2 | a, c, f, i, k, l, m, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E08 | Design and Formulation of Foods | 1 | a, b, c, e, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E09 | Design of Food Process Equipment | 1,2,3 | a, b, c, d, e, g, l, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E10 | Food Colorants and Flavorants | 1 | a, g, l, n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E11 | Process Control for Food Engineers | 1,2 | a, b, d, e, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E12 | Postharvest Technology | 1,2 | a, b, c, d, e, f, g, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT6E13 | Crop Processing Technology | 2, 3 | a, e, l, m, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Professional Elective - IV

| Course code | Course Title | Objectives & outcomes | | Instruction hours / week | | | Credits | Maximum Marks | | |
|-------------|--|-----------------------|------------------------|--------------------------|---|---|---------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| | SEMESTER -VII | | | | | | | | | |
| 19BTFT7E01 | Lipid Processing Technology | 1, 3 | a, b, c, d, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT7E02 | Role of Nanotechnology in Food Processing | 1, 3 | a, b, d, g, i, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT7E03 | New Product Development and Sensory Science | 2 | a, b, d, f, l, m, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT7E04 | Marketing Management and International Trade | 1, 2, 3 | b, h, i, j, l, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT7E05 | Supply Chain Management | 1,3 | a, d, f, g, h, i, j, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Professional Elective – V & VI

| Course code | Course Title | Objectives & out comes | | Instruction hours / week | | | Credits | Maximum Marks | | | |
|-------------|-------------------------------------|------------------------|------------------|--------------------------|---|---|---------|---------------|-----|-------|--|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total | |
| | | | | | | | | 40 | 60 | 100 | |
| | SEMESTER –VIII | | | | | | | | | | |
| 19BTFT8E01 | Functional Foods and Nutraceuticals | 1,2 | a, b, d, f, l, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 | |

| | | | | | | | | | | |
|-------------|--------------------------------------|--------|---------------------------|---|---|---|---|----|----|-----|
| 19BTFT8E02 | Food Biotechnology | 1,3 | a, b, e, f, m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E03 | Protein Chemistry and Technology | 1,2 | a, b, d, e, i, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E04 | Advanced Drying Technology | 1, 3 | a, b, c, e, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E05 | Food Fermentation Technology | 1,3 | a, b, d, g, m, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E06 | Extrusion Technology | 1,2 | a, c, e, f, l, m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E07 | Sugar Technology | 1,3 | a, b, c, f, m, n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E08 | Food Allergy and Toxicology | 2 | a, b, f, g, m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E09 | Waste Management in Food Industries | 1,2,3 | a, b, f, l, m, n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E10 | Total Quality Management | 2,3 | a, b, d, g, f, i, l, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFT8E011 | Food Storage and Logistic Management | 1,2 ,3 | a, b, c, d, e, g, l, m, n | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

OPEN ELECTIVES I & II (OFFERED BY FOOD TECHNOLOGY)

| SUB. CODE | TITLE OF THE COURSE | PEO | PO | L | T | P | C | CIA | ESE | TOTAL |
|------------------------|---|-----|-----------------|---|---|---|---|-----|-----|-------|
| FOOD TECHNOLOGY | | | | | | | | | | |
| 19BTFTOE01 | Processing of Food Materials | 1,3 | a,b,c,m,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 1,3 | a,b,c,m,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 1,3 | a,b,c,m,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 1,3 | a,b,c,d,g,m,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

**OPEN ELECTIVES
COURSES OFFERED BY OTHER DEPARTMENTS**

| SUB. CODE | TITLE OF THE COURSE | PEO | PO | L | T | P | C | CIA | ESE | TOTAL |
|--|---|-------|-----------------|---|---|---|---|-----|-----|-------|
| SCIENCE AND HUMANITIES | | | | | | | | | | |
| 19BTSHOE01 | Solid Waste Management | 1,2 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE02 | Green Chemistry | 1,2,3 | a,b,c,d,e,f,g,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE03 | Applied Electrochemistry | 2,3 | a,b,c,d,e,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE04 | Industrial Chemistry | 2,3 | a,b,c,d,f,g,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE05 | Technical Writing | 2,3 | a,h,i,j,l | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE06 | Geophysics | 2,3 | a,b,c,e, k, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE07 | Engineering Acoustics | 2,3 | a,b,c,d, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE08 | Industrial Mathematics – I | 2,3 | a,b,e,h,i,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE09 | Industrial Mathematics – II | 2,3 | a,b,e,h,i,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE10 | Fuzzy Mathematics | 2,3 | a,b,e,h,i,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE11 | Mathematical Physics | 2,3 | a,b,e,h,i | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTSHOE12 | Linear Algebra | 2,3 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| COMPUTER SCIENCE AND ENGINEERING | | | | | | | | | | |
| 19BECOE01 | Internet Programming | 2,3 | a,b,c,d,e, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE02 | Multimedia and Animation | 2,3 | a,b,c,d,e, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE03 | PC Hardware and Trouble shooting | 2,3 | a,b,c,d,e, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECOE04 | Java Programming | 2,3 | a,b,c,d,e, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRICAL AND ELECTRONICS ENGINEERING | | | | | | | | | | |
| 19BEEEOE01 | Electric Hybrid Vehicle | 2 | a,b, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE02 | Energy Management & Energy Auditing | 2 | a,b,f,g, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE03 | Programmable Logic Controller | 2 | a,b,f | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEEEOE04 | Renewable Energy Resources | 1,2 | a,b,c,e,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| ELECTRONICS AND COMMUNICATION ENGINEERING | | | | | | | | | | |
| 19BEECOE01 | Real Time Embedded Systems | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE02 | Consumer Electronics | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE03 | Neural Networks and its Applications | 1 | a,b, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEECOE04 | Fuzzy Logic and its Applications | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| AUTOMOBILE ENGINEERING | | | | | | | | | | |
| 19BEAEOE01 | Automobile Engineering | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE02 | Two And Three Wheeler Technology | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE03 | Vehicle Maintenance | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEAEOE04 | Modern Vehicle Technology | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CIVIL ENGINEERING | | | | | | | | | | |
| 19BECEOE01 | Housing Plan And Management | 1 | a,b,c,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE02 | Building Services | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE03 | Repair And Rehabilitation Of Structures | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BECEOE04 | Computer Aided Civil | 1,3 | a,b,e,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

| | | | | | | | | | | |
|-------------------------------|---|-------|-----------------|---|---|---|---|----|----|-----|
| | Engineering Drawing | | | | | | | | | |
| MECHANICAL ENGINEERING | | | | | | | | | | |
| 19BEME0E01 | Computer Aided Design | 1,3 | a,b,d, e,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E02 | Industrial Safety and Environment | 1,3 | a,b,c,f,g,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E03 | Transport Phenomena | 1 | a,b | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEME0E04 | Introduction to Biomechanics | 1,3 | a,b,c,e,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| CHEMICAL ENGINEERING | | | | | | | | | | |
| 19BTCE0E01 | Energy management in chemical industries | 1,3 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE0E02 | Fertilizer technology | 1,3 | a,b,c,d,f,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE0E03 | Industrial wastewater treatment | 1,2,3 | a,b,c,d,f,g,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTCE0E04 | Solid and hazardous waste management | 1,2,3 | a,b,c,d,f,g,m,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOMEDICAL ENGINEERING | | | | | | | | | | |
| 19BEBME0E01 | Robotics In Medicine | 1 | a,b,c,e, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME0E02 | Virtual Reality And Augmented Reality | 1 | a,b,c,e, | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BEBME0E03 | Artificial Organs And Implants | 1,3 | a,b,c,e,h | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| BIOTECHNOLOGY | | | | | | | | | | |
| 19BTBTOE01 | Bioreactor Design | 1,2,3 | a,b,c,d,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE02 | Food Processing and Preservation | 1 | a,b,c,g,m, n, o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE03 | Basic Bioinformatics | 1,3 | a,b,c,d,e,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTBTOE04 | Fundamentals of Nanobiotechnology | 1,3 | a,b,m | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| FOOD TECHNOLOGY | | | | | | | | | | |
| 19BTFTOE01 | Processing of Food Materials | 1,3 | a,b,c,m,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE02 | Nutrition and Dietetics | 1,3 | a,b,c,m,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE03 | Ready to Eat Foods | 1,3 | a,b,c,m,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19BTFTOE04 | Agricultural Waste and Byproducts Utilization | 1,3 | a,b,c,d,g,m,n,o | 3 | 0 | 0 | 3 | 40 | 60 | 100 |

Note:

- **Blue font** represents Employability courses
- **Green font** represents Entrepreneurship courses
- **Red font** represents Skill development courses

DEPARTMENT OF FOOD TECHNOLOGY
B.TECH FOOD TECHNOLOGY

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

1. To provide students with a strong base of theoretical and practical knowledge of food processing and technology.
2. To implement the knowledge and skills to find workable solutions to troubleshoot the challenges involved in the food processing and its related sectors.
3. To exhibit ethical attitude, leadership, interdisciplinary skills, adapt to current trends through lifelong learning and to serve the society.

PROGRAMME OUTCOMES (POs)

- a. **Engineering Knowledge:** Ability to apply knowledge of mathematics, sciences and engineering to overcome challenges in food and its related sectors
- b. **Problem analysis:** Applying the key principles of mathematics, natural science and engineering science to identify, formulate and analyze solutions for engineering problems
- c. **Design/Development of Solutions:** Design and develop a durable solution to address various issues in manufacturing, sustainability, and food safety by using recent food technology concepts.
- d. **Investigations of Complex Problems:** Use research based knowledge and research methods, including design of experiments, analysis and interpretation of data.
- e. **Modern Tool Usage:** With the use of the advanced scientific tools and modern engineering, develop the food processing technology for the benefits of mankind.
- f. **The Engineer and Society:** Understand the impact of engineering solutions in a global and societal context
- g. **Environment and Sustainability:** Impart the principles of waste management / byproduct utilization to develop value added products for a sustainable environment.
- h. **Ethics:** Demonstrate knowledge of professional and code of ethical conduct.
- i. **Individual and Team Work:** Play as an effective individual or active member or leader in diverse multidisciplinary forum.
- j. **Communication:** Communicate effectively in both verbal and written forms.
- k. **Project Management and Finance:** Proact with knowledge of process economics and financial management to design and manage projects.
- l. **Life-long Learning:** Realize the need to engage in learning activities throughout their life.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- At the end of the B.Tech Food Technology program, the graduates will be able to
- m. Acquire a detailed knowledge of food science, food processing and preservation technology.
 - n. Apply skills of food technology to design and develop methods to produce quality, nutritious and safe food products.
 - o. Innovate ideas to develop economic food products and cost effective preservation methods to fulfill the societal needs and for sustainable development.

Food Technology (PEO-PO / PSO mapping)

| | PO/PSO | | | | | | | | | | | | | | |
|-----|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 1 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | | | ✓ | ✓ | ✓ |
| 2 | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| 3 | | | | ✓ | | | | | ✓ | | ✓ | ✓ | | ✓ | ✓ |

FACULTY OF ARCHITECTURE

B.ARCH- CURRICULUM

2019-2020 batch

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

Bachelor of Architecture curriculum is designed to prepare the graduates having knowledge and Skillful aptitude

- I. To become a successful Professional
- II. To imbibe and implant a strong foundation in Architectural Design Skills involving advanced Technological science and social concern.
- III. To learn the theoretical aspects, critical thinking process and Practices in the field of Architecture and design.
- IV. To update themselves of new developments in the field of architecture
- V. To follow and inspire high ethical values in professional practice.

PROGRAMME OUTCOME (PO):

- 1) Ability to gain knowledge of Building Science, Technology, Engineering, Architecture and Humanities.
- 2) Ability to understand and analyse theoretical knowledge and to apply the principles, elements and construction details and techniques in Architectural Design.
- 3) Ability to identify social, economical, environmental and cultural issues and to restructure the evolution of Design accordingly.
- 4) Ability to understand ethical and professional responsibilities.
- 5) Ability to review the technological developments in the profession of architecture and construction.
- 6) Ability to understand real life situation of Architectural Practice.
- 7) Ability to communicate effectively and work in interdisciplinary groups.

PROGRAMME SPECIFIC OUTCOME(PSO):

8. Ability to gain overall knowledge in the field of Architecture and Design and contribute the best to the development of the society and the country.

9. Ability to become a successful professional with ethical values

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOME:

A broad relation between the programme objectives and the outcome is given in the following table

| PEO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO8 | PSO9 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| I | | | | √ | √ | √ | √ | √ | √ |
| II | √ | | √ | | | | | √ | √ |
| III | | √ | √ | | | | | √ | √ |
| IV | | | | | √ | √ | | √ | √ |
| V | | | | √ | | √ | √ | √ | √ |

B.ARCH - CURRICULUM
2019-2020 batch
Choice Based Credit System

Subject Legend: ART – Theory -0, ARP – Practical-1, ARS – Studio-2, ARE – Elective-3,
L- lecture , T- Theory, P/S- Practical /Studio C- Credits
Abbreviation: CIA – Continuous Internal Assessment; ESE – End Semester Exam
Exam Hours : Theory(T)-3 Hrs Practical (P)-6 Hrs Studio(S)- 6 hrs

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---------------------------------------|-----------------------------|--------------|-----------------------------|---|---------|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P/ S | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - I | | | | | | | | | | |
| 19ART101 | History of Architecture – I | III | 3,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART102 | Mathematics in Architecture | III | 1, 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART103 | Environmental Studies | III | 3,6 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARP111 | ArtApprecition and Model making | II,III | 2,6,7 8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19ARS121 | Architectural Design -I | I,II,II I,IV | 2,6,7 8,9 | - | - | 10 | 10 | 200 | 300 | 500 |
| 19ARS122 | Building Materials | I,IV, V | 2,4 8,9 | 1 | - | 5 | 4 | 80 | 120 | 200 |
| 19ARS123 | Architectural Graphics | I,II | 1,2 8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 9 | - | 21 | 26 | 520 | 780 | 1300 |
| SEMESTER – II | | | | | | | | | | |
| 19ART201 | History of Architecture – II | III | 3,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART202 | Concept of Building Structures | II,III | 2 ,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART203 | Theory of Architecture | II,III | 2 ,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARP211 | Computer Application – I | I,II,I V | 2,5,8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19ARS221 | Architectural design –II | I,II,II I,IV | 2,6,7 8,9 | - | - | 10 | 10 | 200 | 300 | 500 |
| 19ARS222 | Building Materials and construction-I | I,IV, V | 2,4 8,9 | 1 | - | 5 | 4 | 80 | 120 | 200 |
| 19ARS223 | Measured Drawing and Documentation | I,II | 1,2 ,8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 9 | - | 21 | 26 | 520 | 780 | 1300 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|--------------------------|--------------|--------------------------|---|------|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P /S | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - III | | | | | | | | | | |
| 19ART301 | History of Architecture – III | III | 3,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART302 | Design of Structures I | II,III | 2,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART303 | Building Services- I | III,IV | 2,5 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARP311 | Surveying, levelling and Site Planning | II,III | 2,8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19ARS321 | Architectural design -III | I,II,III,IV | 2,6,7 8,9 | - | - | 10 | 10 | 200 | 300 | 500 |
| 19ARS322 | Building Materials & construction - II | I,IV,V | 2,4 8,9 | 1 | - | 5 | 4 | 80 | 120 | 200 |
| 19ARS323 | Climate Responsive Architecture | III,IV | 2,5 ,8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 9 | - | 21 | 26 | 520 | 780 | 1300 |
| SEMESTER – IV | | | | | | | | | | |
| 19ART401 | Contemporary Architecture – I | III,IV | 2,3 ,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART402 | Design of Structures - II | II,III | 2,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART403 | Acoustics and Lighting | II,III | 2,8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARP411 | Computer Application -II | I,II,IV | 2,5,8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19ARS421 | Architectural design –IV | I,II,III,IV | 2,6,7 8,9 | - | - | 10 | 10 | 200 | 300 | 500 |
| 19ARS422 | Building Materials & construction - III | I,IV,V | 2,4 ,8,9 | 1 | - | 5 | 4 | 80 | 120 | 200 |
| 19ARS423 | Building Services - II | III,IV | 2,5 ,8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 9 | - | 21 | 26 | 520 | 780 | 1300 |
| SEMESTER –V | | | | | | | | | | |
| 19ART501 | Contemporary Architecture - II | III,IV | 2,3 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART502 | Landscape Architecture | I,II,IV | 2,5 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARP511 | Computer Application III | I,II,IV | 2,5 8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19ARS521 | Architectural design -V | I,II,III,IV | 2,6,7 8,9 | - | - | 10 | 10 | 200 | 300 | 500 |
| 19ARS522 | Building Materials & construction - IV | I,IV,V | 2,4 8,9 | 1 | - | 5 | 4 | 80 | 120 | 200 |
| 19ARET*** | Elective 1 | I,IV | 5,6,7 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARES*** | Elective 2 | I,IV | 5,6,7 8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 9 | - | 21 | 26 | 520 | 780 | 1300 |

List of Elective subjects-***

| | |
|-----------|---|
| 19ARET531 | Progressive Architecture |
| 19ARET532 | Environmental Planning |
| 19ARES533 | Advanced Structural Design |
| 19ARES534 | Building services for special buildings |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|---|---|--------------------------|---------------|--------------------------|---|-----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P/S | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER VI | | | | | | | | | | |
| 19ART601 | Building Codes and Regulations | I,IV, V | 4,6 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART602 | Estimation and Specification | III,IV | 2,5,6 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARS621 | Architectural design –VI | I,II,II I,IV | 2,6,7 8,9 | - | - | 10 | 10 | 200 | 300 | 500 |
| 19ARS622 | Architectural detailing &Working drawing | I,IV, V | 1,5,6 8,9 | 2 | - | 4 | 4 | 80 | 120 | 200 |
| 19ARS623 | Vernacular Architecture | II,III | 1,3,5 8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19ARET*** | Elective 3 | I,IV | 5,6,7 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARES*** | Elective 4 | I,IV | 5,6,7 8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 10 | - | 20 | 26 | 520 | 780 | 1300 |
| <u>List of Elective subjects ***</u> 19ARET631Architectural Conservation 19ARET632 Vaastu and principles of Traditional Indian Architecture 19ARES633 Product design 19ARES634 Architectural Journalism | | | | | | | | | | |
| SEMESTER VII | | | | | | | | | | |
| 19ARP711 | Practical Training I: Client Meeting/Interaction Site Visits, Verification and Measurement Concept and Scheme Development Construction Documents/Drawings Training Portfolio I | I,IV, V | 1,4,5,6, 7 | - | - | - | 18 | 360 | 540 | 900 |
| Semester Total | | | - | - | - | | 18 | 360 | 540 | 900 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|--|--|---|--------------|--------------------------|---|------|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P/ S | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER VIII | | | | | | | | | | |
| 19ART801 | Physical Planning | III,IV | 2,3,5 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART802 | Urban Design | III,IV | 2,3,6 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARS821 | Architectural design –VII | I,II,III,I V | 2,6,7 8,9 | - | - | 10 | 10 | 200 | 300 | 500 |
| 19ARS822 | Interior Design | I | 5,8,9 | 2 | - | 3 | 4 | 80 | 120 | 200 |
| 19ARS823 | Sustainable Architecture | III,IV | 2,3,6 | 2 | - | 3 | 4 | 80 | 120 | 200 |
| 19ARET*** | Elective 5 | I,IV | 5,6,7 8,9 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARES*** | Elective 6 | I,IV | 5,6,7 8,9 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 11 | - | 19 | 27 | 540 | 810 | 1350 |
| List of Elective subjects (any Two) | | | | | | | | | | |
| 19ARET831 | Earth quake resistance Architecture | 19ARET832Integrated Building Management Systems | | | | | | | | |
| 19ARES833 | Industrial Architecture | 19ARES834Digital Architecture | | | | | | | | |
| 19ARES835 | Visual Communication Design | | | | | | | | | |
| SEMESTER IX | | | | | | | | | | |
| 19ART901 | Housing | I,V | 4,5,6 ,7 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ART902 | Research Methods and Field studies | III,IV | 2,5 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARS921 | Architectural Design -VIII- (Urban Design) | III,IV | 2,5,7 | - | | 14 | 14 | 280 | 420 | 700 |
| 19ARS922 | Dissertation | I,II,III,I V | 2,6,7 | - | - | 6 | 3 | 60 | 90 | 150 |
| 19ARET*** | Elective 7 | I,IV | 5,6,7 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19ARES*** | Elective 8 | I,IV | 5,6,7 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 7 | - | 23 | 26 | 520 | 780 | 1300 |
| List of Elective subjects (Any Two) | | | | | | | | | | |
| 19ARET931 | Disaster management | 19ARET932 Real estate management | | | | | | | | |
| 19ARES933 | High rise buildings | | | | | | | | | |
| 19ARES934 | Green Buildings | | | | | | | | | |
| SEMESTER X | | | | | | | | | | |
| 19ARS1021 | Professional practice | I,V | 2 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19ARS1022 | Project Management | I,V | 2 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19ARS1023 | Architectural Thesis | I,II,III,I V,V | 4,5,6 ,7 | - | - | 18 | 18 | 360 | 540 | 900 |
| Semester Total | | | | 2 | - | 24 | 24 | 480 | 720 | 1200 |

Credits :

| Course | Credits |
|----------------------|------------|
| Theory | 40 |
| Practical | 15 |
| Studio | 137 |
| Elective | 20 |
| Practical Training | 18 |
| Dissertation | 3 |
| Architectural thesis | 18 |
| Total | 251 |

Total Marks :

| Semester | Total Credits | Marks |
|----------------|---------------|--------------|
| Semester- I | 26 | 1300 |
| Semester- II | 26 | 1300 |
| Semester- III | 26 | 1300 |
| Semester- IV | 26 | 1300 |
| Semester- V | 26 | 1300 |
| Semester- VI | 26 | 1300 |
| Semester- VII | 18 | 900 |
| Semester- VIII | 27 | 1350 |
| Semester- IX | 26 | 1300 |
| Semester- X | 24 | 1200 |
| Total | 251 | 12550 |

Entrepreneur Oriented Courses -Green

Employability Oriented Courses -Blue

Skill Development Oriented Courses -Red



FACULTY OF ARCHITECTURE
B.DES (INTERIOR DESIGN) - CURRICULUM
2019 - 2020 Batch

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

1. To prepare students to excel in computer applications to succeed in industry/ technical profession. The need to Design and present the ideas onto the working format
2. To provide students with solid foundation in technical design and aesthetics combination fundamentals required to solve related projects and also to pursue higher studies and research.
3. To train students with good design breadth with material understanding so as to comprehend, analyze, design and create design solutions for the real life projects.
4. To inculcate students in professional and ethical attitude, effective communication skills, multidisciplinary approach and an ability to relate design issues to broader social context.
5. To provide students with an academic environment aware of excellence, leadership and continuous learning, on technology and trends needed for a successful career.

PROGRAMME OUTCOMES (POs):

On successful completion of the program,

1. Graduates will acquire knowledge of basic design, digital fundamentals, design concepts, materials and a broader understanding into services and execution.
2. Graduates will have an ability to practically identify, formulate and implement design solutions and foray into main stream of the professional practice..
3. Graduates will have an ability to design and conduct experiments, analyze and interpret design data and make suitable drawings and 3d visualizations for execution..
4. Graduates will be able to design variety of projects based on the user study analysis and formulate requirements and design types along with styles and aesthetics related to the above.
5. Graduates will have the skill to work on bring in costing and project execution elements and they will recognize and implement related emerging disciplines. Graduates will be able to communicate the design language effectively in both verbal and written form.

PROGRAMME SPECIFIC OUTCOME (PSO):

6. Graduates will demonstrate skills to use modern tools, software and equipments to analyze project solutions.
7. Graduates will exhibit the knowledge of professional and ethical responsibilities. Graduates will have a confidence for self education and ability for continuous learning on trends and technologies along with an attitude to excel in the field

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOME:

A broad relation between the programme objectives and the outcome is given in the following table

| <i>PEO</i> | <i>PO1</i> | <i>PO2</i> | <i>PO3</i> | <i>PO4</i> | <i>PO5</i> | <i>PSO6</i> | <i>PSO7</i> |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|--------------------|
| <i>1</i> | | | | ✓ | ✓ | ✓ | ✓ |
| <i>2</i> | ✓ | | ✓ | | | | |
| <i>3</i> | | ✓ | ✓ | | | | |
| <i>4</i> | | | | | ✓ | ✓ | |
| <i>5</i> | | | | ✓ | | ✓ | ✓ |

B.DES – CURRICULUM
2019 - 2020 batch (New Syllabus)
PROGRAMME DTRUCTURE:

Subject Legend:

- **IDT - Theory - 0**
- **IDP - Practical - 1**
- **IDS - Studio - 2**
- **IDE - Elective - 3**
- **IDV - Value - 4**

Abbreviations:

CIA - Continuous Internal Assessment;

ESE – End Semester Exam

FACULTY OF ARCHITECTURE

B.DES - CURRICULUM

2019 - 2020 Batch

PROGRAM STRUCTURE:

Subject Legend: IDT – Theory -0, IDP – Practical-1, IDS – Studio-2, IDE – Elective-3, IDV – Value-4

Abbreviation: CIA – Continuous Internal Assessment; ESE – End Semester Exam

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|-------------------------|-------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – I | | | | | | | | | | |
| 19IDT101 | Theory of Interiors | III | 1,6 | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDT102 | History of Interiors - I | II | 1,6 | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 19IDT103 | Environmental Studies | II | 3,6 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19IDP111 | Art and craft | II | 1,4,6 | 1 | - | 3 | 3 | 60 | 90 | 150 |
| 19IDS121 | Basic Interior Design - I | III | 2,4,5 | 0 | 0 | 12 | 8 | 160 | 240 | 400 |
| 19IDS122 | Interior Materials & Construction - I | III | 1,6,7 | 2 | 0 | 5 | 4 | 80 | 120 | 200 |
| 19IDS123 | Interior Graphics - I | I | 1,6,7 | 1 | 0 | 5 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 11 | 0 | 29 | 25 | 480 | 720 | 1200 |
| SEMESTER – II | | | | | | | | | | |
| 19IDT201 | Psychology of Interiors | III | 1.4,7 | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDT202 | History of Interiors - II | II | 1,4,7 | 3 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDP211 | Computer applications - I | I | 3,6,7 | 1 | 0 | 4 | 3 | 60 | 90 | 150 |
| 19IDP212 | Model Making | II | 3,6,7 | 1 | 0 | 4 | 3 | 60 | 90 | 150 |
| 19IDS221 | Interior Design - II | III | 3,6,7 | 0 | 0 | 12 | 8 | 160 | 240 | 400 |
| 19IDS222 | Interior Materials & Construction - II | III | 1,6,7 | 3 | 0 | 5 | 4 | 80 | 120 | 200 |
| 19IDS223 | Interior Graphics - II | I | 1,6,7 | 1 | 0 | 4 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 11 | 0 | 29 | 25 | 500 | 750 | 1250 |

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|-----------------------|--|-------------------------|-------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER – III | | | | | | | | | | |
| 19IDT301 | Space Planning and Ergonomics | III | 2,4,7 | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDT302 | Interior Services - I - Plumbing and water supply | II | 1,5,7 | 3 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDP311 | Computer Applications - II | I | 2,6,7 | 4 | 0 | 0 | 3 | 60 | 90 | 150 |
| 19IDP312 | Workshop (Wood, cane& bamboo engineered wood, glass, stone) | II | 1,6,7 | 0 | 0 | 6 | 3 | 60 | 90 | 150 |
| 19IDS321 | Interior Design - III | V | 3,4,7 | 0 | 0 | 12 | 8 | 160 | 240 | 400 |
| 19IDS322 | Advanced materials & applications | IV | 3,4,7 | 1 | 0 | 6 | 4 | 80 | 120 | 200 |
| 19IDS323 | Interior Landscape | V | 1,2,7 | 0 | 0 | 6 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 10 | 0 | 30 | 25 | 500 | 750 | 1250 |
| SEMESTER – IV | | | | | | | | | | |
| 19IDT401 | Furniture Design, Light and Color | II I | 1,3,4 | 2 | - | - | 2 | 40 | 60 | 100 |
| 19IDT402 | Interior Services - II– Electrical wiring, lighting and air conditioning | II | 1,5,7 | 3 | - | - | 2 | 40 | 60 | 100 |
| 19IDP411 | Computer Applications - III | I | 2,5,6 | 4 | - | - | 3 | 60 | 90 | 150 |
| 19IDP412 | Workshop | II | 1,3,6 | - | - | 6 | 3 | 60 | 90 | 150 |
| 19IDS421 | Interior Design - IV | V | 3,6,7 | - | - | 12 | 8 | 160 | 240 | 400 |
| 19IDS422 | Furniture Construction detailing &Modular /custom made | IV | 1,3,4 | 1 | - | 6 | 3 | 60 | 90 | 150 |
| 19IDS423 | Lifestyle accessories design | IV | 1,4,7 | - | - | 6 | 6 | 80 | 120 | 200 |
| Semester Total | | | | 10 | 0 | 30 | 27 | 500 | 750 | 1250 |

| Course code | Name of the course | Objective s and out comes | | Instru ction hours / week | | | Credit(s) | Maximum Marks | | |
|---|---|---------------------------|-------|---------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER – V | | | | | | | | | | |
| 19IDT501 | Contemporary Interiors | II | 1,4,6 | 3 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDT502 | Interior Services - III– Acoustics and climate response | II | 1,5,6 | 3 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDP511 | Computer Graphics | I | 2,3,6 | 4 | 0 | 0 | 3 | 60 | 90 | 150 |
| 19IDP512 | Working drawings and detailing | V | 1,3,4 | 1 | 0 | 5 | 3 | 60 | 90 | 150 |
| 19IDS521 | Interior Design - V | V | 3,6,7 | 0 | 0 | 12 | 8 | 160 | 240 | 400 |
| 19IDS524 | Estimation Costing | IV | 5,6,7 | 1 | 0 | 5 | 3 | 60 | 90 | 150 |
| 19IDES531 | Elective – 2 | IV | 1,6,7 | 1 | 0 | 5 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 13 | 0 | 27 | 22 | 480 | 720 | 1200 |
| Electives 1. 19IDES531A – Signage and graphics 2. 19IDES531B – Product design 3. 19IDES531C - Set Design | | | | | | | | | | |
| SEMESTER – VI | | | | | | | | | | |
| 19IDP611 | Practical Training: Client Meeting/Interaction site Visits, Verification and Measurement concept and Scheme Development Construction Documents/ Drawings Training Portfolio - I | V | 6,7 | 0 | 0 | 0 | 16 | 320 | 480 | 800 |
| 19IDS621 | Field study and documentation | IV | 1,6,7 | 0 | 0 | 6 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 0 | 0 | 6 | 19 | 380 | 570 | 950 |

| Course code | Name of the course | Objectiv es and out comes | | Instructio n hours / week | | | Credit(s) | Maximum Marks | | |
|--|-------------------------------------|------------------------------------|-------|---------------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER – VII | | | | | | | | | | |
| 19IDT701 | Professional Practice | IV | 6,7 | 3 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDT702 | Project management | V | 6,7 | 3 | 0 | 0 | 2 | 40 | 60 | 100 |
| 19IDP711 | Interior Photography and Journalism | IV | 2,3,5 | 1 | 0 | 4 | 3 | 60 | 90 | 150 |
| 19IDP712 | Advanced Workshop | II | 1,3,7 | 1 | 0 | 6 | 4 | 80 | 120 | 200 |
| 19IDS721 | Interior Design - VI | V | 3,6,7 | 2 | 0 | 10 | 8 | 160 | 240 | 400 |
| 19IDS722 | Integrated Project Work | V | 1,6,7 | 0 | 0 | 6 | 3 | 60 | 90 | 150 |
| 19IDP731 | Elective | IV | 1,6,7 | 0 | 0 | 4 | 3 | 60 | 90 | 150 |
| Semester Total | | | | 10 | 0 | 30 | 25 | 500 | 750 | 1250 |
| 19IDPE731A Interior Website and Blogging | | | | | | | | | | |

Design Contextual Studies

Interior Photography

Digital Interiors Branding in Interiors

Interior materials research

Vernacular Interiors.

Adaptive reuse

Interior blogging and website creation..

Total Credits:

Theory Courses - 33 credits

Practical Courses - 51 credits

Studio Courses - 99 credits

Elective Courses - 5 credits

Total - 188 credits

| | | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----------|---------------|--|-----|-----|-----|-----|-----|-----|-----|
| YEAR - I | SEMESTER- I | Theory of Interiors | | # | | | | | |
| | | History of Interiors - I | | | # | | | | |
| | | Space planning & Ergonomics | # | | # | | | | |
| | | Art and craft | | # | | | | # | # |
| | | Basic Interior Design I | | # | | | | # | # |
| | | Interior Materials & Construction I | | # | | | | | |
| | | Interior Graphics I | # | | | | | | |
| | | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
| YEAR - I | SEMESTER- II | Psychology of Interiors | | # | | | | | |
| | | History of Interiors. II | | | # | | | | |
| | | Computer applications I | | # | # | | | | |
| | | Model Making | | # | | | # | | |
| | | Interior Design II | | # | | | | # | # |
| | | Interior Materials & Construction II | | # | | | | | |
| | | Interior Graphics II | # | | | | | | |
| | | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
| YEAR - II | SEMESTER- III | Furniture Design | | | # | | | | |
| | | Interior Services – Plumbing and water supply | | # | | | | | |
| | | Computer Applications II | | # | | | # | | |
| | | Workshop (Wood, cane & bamboo engineered wood, glass, stone) | | # | | | | | |
| | | Interior Design III | | # | | | | # | # |
| | | Advanced materials & applications | | # | | | | | |
| | | Interior Landscape | | # | | | # | | |

| | | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|--------------|---|-----|-----|-----|-----|-----|-----|-----|
| YEAR - II | SEMESTER-IV | Light and Color | # | | | | | # | |
| | | Interior Services – electrical wiring, lighting and air conditioning | | # | | | | | |
| | | Computer Applications III | | # | | | | | |
| | | Workshop (elective) | | # | | | # | | |
| | | Interior Design IV | | # | | | | # | # |
| | | Furniture Construction detailing & Modular /custom made. | | # | | | | | |
| | | Lifestyle accessories design | | # | | | # | | |
| | | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
| YEAR - III | SEMESTER- V | Contemporary Interiors | | # | | | | | |
| | | Interior Services – acoustics and climate response | | # | | | | | |
| | | Computer Graphics | | # | | | # | | |
| | | Working drawings and detailing | | # | | | | # | # |
| | | Interior Design IV | | # | | | | | |
| | | Estimation Costing | # | | # | | | | |
| | | Elective - 2 | # | | # | | | | |
| | | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
| YEAR - III | SEMESTER- VI | <u>Practical Training:</u> Client Meeting/Interaction site Visits, Verification and Measurement concept and Scheme Development Construction Documents/ Drawings Training Portfolio I | # | # | | # | | # | # |
| | | Field study and documentation | | # | | | | # | |

| | | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----------|----------------|---|-----|-----|-----|-----|-----|-----|-----|
| YEAR - IV | SEMESTER- VII | Professional Practice | | # | # | | | # | |
| | | Project management | | # | # | | | # | |
| | | Photography and Journalism | | # | | | | | # |
| | | Workshop (Printing and Textiles) | # | | | | | | |
| | | Elective | # | | | | | | |
| | | Interior Design VI | # | | | | | | |
| | | Integrated Project Work | | | | | | | |
| | | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
| YEAR - IV | SEMESTER- VIII | <u>Design Thesis:</u> Independent work of large interior project comprising study, analysis and design. Project Report , Drawing and Model | # | | | # | | # | # |
| | | Special Study /Elective | | # | | | # | | |

Entrepreneur Oriented Courses -Green
 Employability Oriented Courses -Blue
 Skill Development Oriented Courses -Red



**M.ARCH (Advance Design)
CURRICULUM
2019-2020 batch**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

Master of Architecture curriculum is designed to prepare the graduates having knowledge and Skillful aptitude

- I. To become a successful Professional
- II. To imbibe and implant a strong foundation in Advanced design skills and technical aspects with research-oriented thinking and implementation
- III. To learn the critical thinking process with the application of theoretical aspects and parameters for a quantifiable result.
- IV. To Expertise the architectural and technical knowledge with field study and experimentation.
- V. To bring out various ideas in advanced level for the society in future.

PROGRAMME OUTCOME (PO):

1. Ability to gain deep knowledge and understanding of Advanced Level Architectural design, Building science and simulation, digital applications, housing design.
2. Ability to Research, understand, analyse, synthesize and review the process of design outcome and publish as a report.
3. Ability to review the new technological developments in the profession of architecture and construction.
4. Ability to understand real life situation with enhanced approach towards the Architectural practice.

PROGRAMME SPECIFIC OUTCOME (PSO):

5. Ability to understand the overall design parameters with advanced level of analytical thought process and a quantifiable product based on research.

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOME:

A broad relation between the Programme objectives and the outcome is given in the following table

| PEO | PO1 | PO2 | PO3 | PO4 | PSO5 |
|-----|-----|-----|-----|-----|------|
| I | | | √ | √ | √ |
| II | √ | | √ | | √ |
| III | √ | √ | | | √ |
| IV | √ | √ | | | √ |
| V | √ | | | | √ |



M.ARCH (ADVANCE DESIGN) - CURRICULUM
2019-2020 batch
Choice Based Credit System

Subject Legend:

ART – Theory -0, ARP – Practical-1, ARS – Studio-2, ARE Elective-3,

L- Lecture, T- Theory, P/S- Practical /Studio C- Credits

Abbreviation: CIA – Continuous Internal Assessment; ESE – End Semester Exam

Exam Hours: Theory (T)-3 Hrs Practical (P)-6 Hrs Studio(S) - 6 Hrs

| Course code | Name of the course | Objectives and outcomes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|-------------------------|---------|--------------------------|---|-----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P/S | | CIA | ESE | Total |
| | | | | | | | | 40 | 60 | 100 |
| SEMESTER - I | | | | | | | | | | |
| 19MARS111 | Research Methodology I | I, II, III | 2,4,5 | 1 | - | 2 | 2 | 40 | 60 | 100 |
| 19MARS112 | Design Systems | II, III | 1,3,5 | 2 | - | 4 | 4 | 80 | 120 | 200 |
| 19MARS113 | Design Research & Field Studies | I, IV | 2,4,5 | 1 | - | 2 | 2 | 40 | 60 | 100 |
| 19MARS114 | Advanced Design Studio I | I, IV, V | 3,4,5 | 3 | - | 9 | 8 | 160 | 240 | 400 |
| 19MARES* | Advanced Elective I | II, III, V | 2,3,4,5 | 2 | - | 4 | 4 | 80 | 120 | 200 |
| Semester Total | | | | 08 | - | 22 | 20 | 460 | 540 | 1000 |
| *19MARESS1 | - Introduction to Sustainable Architecture | | | | | | | | | |
| 19MARESH1 | - Introduction to Housing Design | | | | | | | | | |
| SEMESTER – II | | | | | | | | | | |
| 19MARS211 | Research Methodology II | I,II,III | 2,4,5 | 1 | - | 2 | 2 | 40 | 60 | 100 |
| 19MARS212 | Documentation & Presentation | I,IV | 2,4,5 | 1 | - | 2 | 2 | 40 | 60 | 100 |
| 19MARS213 | Advanced Design Studio II | I,IV,V | 3,4,5 | 3 | - | 9 | 7 | 160 | 240 | 400 |
| 19MARES* | Advanced Elective II | II,III,V | 2,3,4,5 | 2 | - | 4 | 4 | 80 | 120 | 200 |
| 19MARES** | Advanced Elective III | II,III,V | 2,3,4,5 | 2 | - | 4 | 4 | 80 | 120 | 200 |
| Semester Total | | | | 08 | - | 22 | 19 | 460 | 540 | 1000 |

| | |
|--|---|
| *19MARESS2 - Building Performance Analysis | **19MARESS3 - Sustainable Design Strategies |
| 19MARESH2 - Housing Policies and Schemes | 19MARESH3 - Sustainable Housing |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|---|----------------------|--------------------------|----------|--------------------------|---|------|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P/ S | | CIA | ESE | Total |
| | | | | | | | | | | |
| SEMESTER - III | | | | | | | | | | |
| 19MARS311 | Dissertation I | I,III,IV, V | 1,2,3, 4 | 2 | - | 10 | 7 | 160 | 240 | 400 |
| 19MARES* | Advanced Elective IV | II,III,V | 2,3,4 | 2 | - | 4 | 4 | 80 | 120 | 200 |
| 19MARES** | Advanced Elective V | II,III,V | 2,3,4 | 2 | - | 4 | 4 | 80 | 120 | 200 |
| Semester Total | | | | 06 | - | 18 | 15 | 320 | 480 | 800 |
| *19MARESS4 - Sustainable Building Systems | | | | | | | | | | |

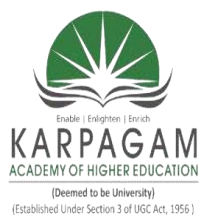
Credit Details :

| | | |
|---------------------|----------|-------------------|
| Studio Courses | - | 27 credits |
| Dissertation course | - | 23 credits |
| Elective Courses | - | 20 credits |
| Total | - | 70 credits |

Entrepreneur Oriented Courses -Green

Employability Oriented Courses -Blue

Skill Development Oriented Courses -Red



M.PLAN (TOWN AND COUNTRY PLANNING) CURRICULUM 2019 - 2020 batch (CBCS)

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs): Masters of Planning curriculum is designed imbibe aptitude and knowledge

1. To educate Students about the social and economical, legal and political, environmental and physical, governance and management aspects of planning.
2. To involve in industry and community collaborative work
3. To imbibe knowledge in concepts, and theories, methods and techniques, social realities and technological advancement.
4. To acquire advanced knowledge in Planning practices by exposed to multi disciplinary learning environment and also engage in individual and group work.
5. To update themselves abreast of new developments in the field of Planning through lifelong learning.
6. Be a part of high performing professionals of prestigious private, public or community organizations of socio-economic, environment and spatial planning relevance.
7. To create world class teaching, research, training and consultancy activities by
 - a. Engaging experienced academics, professionals as part of teaching and evaluation of planning projects, dissertation and thesis and
 - b. Student and faculty exchange program with a partnered university of the world.
8. To emulate and inspire high ethical values in professional practice.

PROGRAM OUTCOME:

1. Ability to gain knowledge in social and economical, legal and political, environmental and physical, governance and management aspects of planning and create livable human settlements in rural, urban and regional areas.
2. Students gain knowledge through class room learning, field visits.
3. Students to get opportunities to publish research paper, display exhibits, present papers in conferences and seminars.
4. Students are also exposed to build confidence and capacity to work in academic, professional, corporate and voluntary sector work environment towards preparation, execution, implementation and monitoring of planning assignments.
5. Ability to gain knowledge in concepts, and theories, methods and techniques and social realities
6. Ability to review, comprehend and report technological developments in the profession of planning
7. Ability to gain advanced knowledge in Planning practices by being exposed to multi disciplinary learning environment.
8. To gain leadership, decision making qualities and display commitment towards adding knowledge.
9. Ability to understand ethical and professional responsibilities.

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOME:

A broad relation between the programme objectives and the outcome is given in the following table

| PEO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 2 | | | √ | √ | | √ | | | |
| 3 | √ | √ | √ | √ | √ | | √ | | |
| 4 | | | √ | | | √ | √ | | |
| 5 | | √ | √ | | | √ | | √ | |
| 6 | | | | √ | | | | √ | √ |
| 7 | √ | | √ | | √ | | | | |
| 8 | | | | | | | | | √ |

M. PLAN (TOWN AND COUNTRY PLANNING)

MASTER OF TOWN AND COUNTRY PLANNING

Curriculum – Full Time (4 Semesters)

2019 - 2020 Batch (CBCS)

Semester I

| Sub. Code | Course Title | Program Outcome | Program Education al objectives | EM / EN / SD | Instruction Hrs / Week | | | Marks | | | C | E H |
|-------------------|--|-------------------------------|---------------------------------|--------------|------------------------|----------|-----------|------------|------------|-------------|-----------|-----|
| | | | | | L | T | P | CIA | ESE | Total | | |
| 19MPN101 | Planning Theory and Practice | PO1, PO3, PO5 | III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN102 | Socio – Economic and Spatial aspects of Human Settlements and Planning | PO1, PO3, PO5 | III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN103 | Traffic and Transportation Planning | PO1, PO3, PO5 | III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN121 | Planning Studio I | PO1, PO2, PO4, PO5, PO6, PSO8 | I, II, IV, V, VI, VIII | EM / EN / SD | 3 | 0 | 10 | 160 | 240 | 400 | 8 | 6 |
| 19MPNE** | Elective I | | | | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| | Report Writing | | | SD | | | | | | | | |
| Sub Total | | | | | 14 | 0 | 18 | 400 | 600 | 1000 | 23 | |
| Elective I | | | | | | | | | | | | |
| Sub. Code | Course Title | Program Outcome | Program Education al objectives | EM/ EN/ SD | Instruction Hrs / Week | | | Marks | | | C | E H |
| | | | | | L | T | P | CIA | ESE | Total | | |
| 19MPNE1A | Public Transport Planning | PO1, PO2, PO5 | III, | EM | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| 19MPNE1B | Transport Economics | PO1, PO2, PO5, PO7 | I, III | EM | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| 19MPNE1C | Disaster Management | PO1, PO2, PO5 | III, | EM | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| 19MPNE1D | Real Estate And Housing Markets | PO1, PO2, PO5, PO7 | I, III | EN | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| 19MPNE1E | Materials, Technology and Infrastructure | PO1, PO2, PO5, PO7 | I, III | EN | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |

Semester II

| Sub. Code | Course Title | Program Outcome | Program Educational objectives | EM / EN / SD | Instruction Hrs / Week | | | Marks | | | C | E H |
|-----------|----------------------------|-------------------------------|--------------------------------|--------------|------------------------|---|----|-------|-----|-------|----|-----|
| | | | | | L | T | P | CIA | ESE | Total | | |
| 19MPN201 | City Planning | PO1, PO3, PO5 | III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN202 | Regional Planning | PO1, PO3, PO5 | III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN203 | Research Methodology | PO1, PO3, PO5 | III, VII | EM/SD | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN221 | Planning Studio II | PO1, PO2, PO4, PO5, PO6, PSO8 | I, II, IV,V,VI, VIII | EM/EN/SD | 3 | 0 | 10 | 160 | 240 | 400 | 8 | 6 |
| 19MPNE** | Elective II | | | | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| | Current trends in planning | | | EM | | | | | | | | |
| Sub Total | | | | | 14 | 0 | 18 | 400 | 600 | 1000 | 23 | |

Elective II

| Sub. Code | Course Title | Program Outcome | Program Educational objectives | EM/ EN / SD | Instruction Hrs / Week | | | Marks | | | C | E H |
|-----------|--|---------------------|--------------------------------|-------------|------------------------|---|---|-------|-----|-------|---|-----|
| | | | | | L | T | P | CIA | ESE | Total | | |
| 19MPNE2A | Rural and Urban Housing | PO1, PO2, PO5 | I, III, VII | | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| 19MPNE2B | Planning Legislation and Professional Practice | PO1, PO2, PO5, PSO9 | I, VII | EN | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| 19MPNE2C | GIS Modeling in Urban and Regional Planning | PO1, PO2, PO5, PO7 | I, III, IV | EM/SD | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| 19MPNE2D | Urban Development And Management | PO1, PO2, PO5, PO7 | I, III, IV | EN | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |
| 19MPNE2E | Inclusive urban planning | PO1, PO2, PO5, PO7 | I, III, IV | EM | 2 | 0 | 8 | 120 | 180 | 300 | 6 | 6 |

Semester III

| Sub. Code | Course Title | Program Outcome | Program Educational objectives | EM/ EN / SD | Instruction Hrs / Week | | | Marks | | | C | E H |
|-----------|--|-------------------------------|--------------------------------|-------------|------------------------|---|----|-------|-----|-------|---|-----|
| | | | | | L | T | | CIA | ESE | Total | | |
| 19MPN301 | Environmental Planning | PO1, PO3 | I,III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN302 | Project Formulation and Implementation | PO1, PO3 | I,III, VII | EN | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN321 | Planning Studio III | PO1, PO2, PO4, PO5, PO6, PSO8 | I, II, III IV,V,VI, VII, VIII | EM/EN/SD | 3 | 0 | 10 | 160 | 240 | 400 | 8 | 6 |
| 19MPN322 | Dissertation | PO1, PO2, | I, II, | EM/ | 3 | 0 | 6 | 120 | 180 | 300 | 6 | 6 |

| | | PO3, PO5, PO6, PO7 | IV,V,VI, VIII | EN/ SD | | | | | | | | |
|---------------------|---|-----------------------|--------------------------------|-------------------|------------------------|----------|-----------|------------|------------|-------------|-----------|--------|
| 19MPNE** | Elective III | | | | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| Sub Total | | | | | 15 | 0 | 16 | 400 | 600 | 1000 | 23 | |
| Elective III | | | | | | | | | | | | |
| Sub. Code | Course Title | Program Outcome | Program Educational Objectives | EM/ EN / SD | Instruction Hrs / Week | | | Marks | | | C | E H |
| | | | | | L | T | P | CIA | ESE | Total | | |
| 19MPNE3A | Environmental Design | PO1, PO3 | I,III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPNE3B | Environmental Impact Assessment | PO1, PO3 | I,III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPNE3C | Environmental Legislation, Evaluation and Practices | PO1, PO3, PSO9 | I,VI,VIII | EN | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPNE3D | Web based Applications to urban and Regional Planning | PO1, PO3, PO6, PO7 | I, II,IV,V | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPNE3E | Planning for tourism | PO1, PO3 | I,III, VII | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |

Semester IV

| Sub. Code | Course Title | Program Outcome | Program Educational objectives | EM/ EN / SD | Instruction Hrs / Week | | | Marks | | | C | E H |
|--------------------|---|---|----------------------------------|-------------------|------------------------|----------|-----------|-------------|-------------|-------------|-----------|--------|
| | | | | | L | T | P | CIA | ESE | Total | | |
| 19MPN401 | Urban Governance and institutional Management | PO1, PO3, PO4, PSO9 | I,II, III | EM | 3 | 0 | 0 | 40 | 60 | 100 | 3 | 3 |
| 19MPN421 | Thesis (Viva Voce) | PO1, PO2, PO3, PO4, PO5, PO6, PO7, PSO8 | I, II, III IV,V,VI, VII, VIII | EM/ EN/ SD | 4 | 0 | 28 | 320 | 480 | 800 | 18 | 6 |
| Sub Total | | | | | 7 | 0 | 28 | 360 | 540 | 900 | 21 | |
| Grand Total | | | | | 50 | 0 | 80 | 1560 | 2340 | 3900 | 90 | |

L – Lecture, T – Tutorial, P – Practical, CIA – Continuous Internal Assessment, ESE – End semester Examination, C – Credits, EH – Exam hours

Entrepreneur Oriented Courses -Green

Employability Oriented Courses -Blue

Skill Development Oriented Courses -Red

FACULTY OF PHARMACY

FACULTY OF PHARMACY
UG PROGRAM (CBCS) – B.PHARM
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|--------------------------|-------|--------------------------|---|---------|--------------|-----------------|-----------------|-----------------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 25/15 /10 | 75/ 35/15 | 100/5 0/25 |
| SEMESTER - I | | | | | | | | | | |
| 19BP101T | Human Anatomyand Physiology - I Theory | 5 | k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP102T | Pharmaceutical Analysis - Theory | 1 | c | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP103T | Pharmaceutics–Theory | 1 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP104T | Pharmaceutical Inorganic Chemistry– Theory | 5 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP105T | Communication skills–Theory* | 3 | h | 2 | - | - | 2 | 15 | 35 | 50 |
| 19BP106RBT | Remedial Biology/ | 5 | a | 2 | - | - | 2 | 15 | 35 | 50 |
| 19BP106RMT | Remedial Mathematics –Theory* | | | | | | | | | |
| 19BP107P | Human Anatomy and Physiology I – Practical | 5 | b | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP108P | Pharmaceutical Analysis- Practical | 1 | b,c | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP109P | Pharmaceutics-Practical | 1 | b | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP110P | Pharmaceutical Inorganic Chemistry– Practical | 5 | b,j | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP111P | Communication skills–Practical* | 3 | h | - | - | 2 | 1 | 10 | 15 | 25 |
| 19BP112RBP | Remedial Biology– Practical* | 5 | a | - | - | 2 | 1 | 10 | 15 | 25 |
| Semester Total | | | | 14/ 16* | 4 | 18/ 20* | 27/ 29*/ 30* | 185 /200* /210* | 490 /525* /540* | 675 /725* /750* |
| SEMESTER – II | | | | | | | | | | |
| 19BP201T | Human Anatomy and Physiology II– Theory | 5 | k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP202T | Pharmaceutical Organic Chemistry -I Theory | 5 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP203T | Biochemistry– Theory | 5 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP204T | Pathophysiology– Theory | 2,6 | b,f,i | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP205T | Computer Applications inPharmacy– Theory* | 4 | d | 3 | - | - | 3 | 25 | 50 | 75 |
| 19BP206T | Environmental sciences– Theory* | 4 | j | 3 | - | - | 3 | 25 | 50 | 75 |
| 19BP207P | Human Anatomy and Physiology – II Practical | 5 | k | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP208P | Pharmaceutical Organic Chemistry- I Practical | 5 | a,b,j | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP209P | Biochemistry– Practical | 5 | a,b | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP210P | Computer Applications inPharmacy– Practical* | 4 | d | - | - | 2 | 1 | 10 | 15 | 25 |
| Semester Total | | | | 18 | 4 | 14 | 29 | 205 | 520 | 725 |

*Class Examination (The subject experts at department level shall conduct examinations)

| Course code | Name of the course | Objective s and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|---------------------------------|-------|--------------------------------|---|----|-----------|---------------|-------|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 25/15 | 75/35 | 100 |
| SEMESTER - III | | | | | | | | | | |
| 19BP301T | Pharmaceutical Organic Chemistry – II Theory | 5 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP302T | Physical Pharmaceutics -I Theory | 5 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP303T | Pharmaceutical Microbiology– Theory | 1 | k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP304T | Pharmaceutical Engineering – Theory | 1,5 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP305P | Pharmaceutical Organic Chemistry -II Practical | 5 | a,b,j | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP306P | Physical Pharmaceutics -I Practical | 5 | b | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP307P | Pharmaceutical Microbiology– Practical | 1 | a,b | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP308P | Pharmaceutical Engineering –Practical | 1,5 | a,c | - | - | 4 | 2 | 15 | 35 | 50 |
| Semester Total | | - | - | 12 | 4 | 16 | 24 | 160 | 440 | 600 |
| SEMESTER – IV | | | | | | | | | | |
| 19BP401T | Pharmaceutical Organic Chemistry –III Theory | 5 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP402T | Medicinal Chemistry – I Theory | 1 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP403T | Physical Pharmaceutics –II Theory | 5 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP404T | Pharmacology -I Theory | 5 | a,d,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP405T | Pharmacognosy and Phytochemistry –I Theory | 1 | a | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP406P | Medicinal Chemistry –I Practical | 1 | a,b | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP407P | Physical Pharmaceutics -II Practical | 5 | b | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP408P | Pharmacology – I Practical | 5 | a,b,d | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP409P | Pharmacognosy and Phytochemistry –I Practical | 1 | a,b | - | - | 4 | 2 | 15 | 35 | 50 |
| Semester Total | | - | - | 15 | 5 | 16 | 28 | 185 | 515 | 700 |

| Course code | Name of the course | Objective s and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|---------------------------------|-----------|--------------------------------|---|----|-----------|---------------|-----------|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 25/15 | 75/ 35 | 100 |
| SEMESTER - V | | | | | | | | | | |
| 19BP501T | Medicinal Chemistry -II Theory | 1 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP502T | Industrial Pharmacy I–Theory | 1,5 | a,c, k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP503T | Pharmacology -II Theory | 5 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP504T | Pharmacognosy and Phytochemistry II– Theory | 1 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP505T | Pharmaceutical Jurisprudence – Theory | 3,4 | a,e, g | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP506P | Industrial Pharmacy I –Practical | 1 | a,c | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP507P | Pharmacology -IIPractical | 5 | a,d | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP508P | Pharmacognosy and Phytochemistry -II Practical | 1 | a,b | - | - | 4 | 2 | 15 | 35 | 50 |
| Semester Total | | - | - | 15 | 5 | 12 | 26 | 170 | 480 | 650 |
| SEMESTER –VI | | | | | | | | | | |
| 19BP601T | Medicinal Chemistry -III Theory | 1 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP602T | Pharmacology - III Theory | 5 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP603T | Herbal Drug Technology– Theory | 1,5 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP604T | Biopharmaceutics andPharmacokinetics – Theory | 5 | a,c, k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP605T | Pharmaceutical Biotechnology– Theory | 1 | k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP606T | Quality Assurance –Theory | 1,4 | a,c, k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP607P | Medicinal Chemistry -III Practical | 1 | a,b | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP608P | Pharmacology -IIIPractical | 5 | a,d | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP609P | Herbal Drug Technology– Practical | 1,5 | a,b | - | - | 4 | 2 | 15 | 35 | 50 |
| Semester Total | | - | - | 18 | 6 | 12 | 30 | 195 | 555 | 750 |

| Course code | Name of the course | Objective s and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|--|---------------------------------|---------------------------------------|--------------------------------|-------------|----|-----------|---------------|---------------|-----------------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 25/15 | 75/ 35 | 100 |
| SEMESTER - VII | | | | | | | | | | |
| 19BP701T | Instrumental Methods of Analysis – Theory | 1 | c | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP702T | Industrial Pharmacy II– Theory | 1,5 | a,c, k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP703T | Pharmacy Practice – Theory | 2,6 | a,f,i | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP704T | Novel Drug Delivery System– Theory | 1,5 | a,k | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP705P | Instrumental Methods of Analysis – Practical | 1 | a,c | - | - | 4 | 2 | 15 | 35 | 50 |
| 19BP706PS | Practice School* | 1,2 ,3, 4,5 ,6 | a,b, c,d, e,f, g,h, i,j,k | - | - | 12 | 6 | 25 | 125 | 150 |
| Semester Total | | - | - | 12 | 4 | 16 | 24 | 140 | 460 | 600 |
| SEMESTER –VIII | | | | | | | | | | |
| 19BP801T | Biostatistics and Research Methodology– Theory | 4,5 | B,c, d | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP802T | Social and Preventive Pharmacy– Theory | 3,6 | f,g, h,j | 3 | 1 | - | 4 | 25 | 75 | 100 |
| 19BP803ET | Pharma Marketing Management– Theory | 1,3 | f | 3 + 3 | 1 + 1 | - | 8 | 25 + 25 | 75 + 75 | 100 + 100 |
| 19BP804ET | Pharmaceutical Regulatory Science– Theory | 3,4 | c,k | | | - | | | | |
| 19BP805ET | Pharmacovigilance– Theory | 2,5 | a,h,i | | | - | | | | |
| 19BP806ET | Quality Control and Standardizations of Herbals– Theory | 1 | b | | | - | | | | |
| 19BP807ET | Computer Aided Drug Design– Theory | 1,5 | d | | | - | | | | |
| 19BP808ET | Cell and Molecular Biology– Theory | 4,5 | j,k | | | - | | | | |
| 19BP809ET | Cosmetic Science– Theory | 1 | a | | | - | | | | |
| 19BP810ET | Pharmacological Screening Methods-Theory | 5 | a,i | | | - | | | | |
| 19BP811ET | Advanced Instrumentation Techniques– Theory | 1,5 | c | | | - | | | | |
| 19BP812ET | Dietary supplements and nutraceuticals | 1 | a,h | | | | | | | |
| 19BP813ET | Pharmaceutical Product Development (Theory) | 1 | a | | | | | | | |
| 19BP812PW | Project Work | 1,3 ,4 | a,d, e,g | - | - | 12 | 6 | - | 150 | 150 |
| Semester Total | | - | - | 12 | 4 | 12 | 22 | 100 | 450 | 550 |

PROGRAMME OUTCOMES (PO)

The graduate student at the end of the B.Pharm program will be able to face the challenges of the profession of pharmacy in the constituent disciplines namely, Industry, Practice (Community and Hospital) and Research as described below;

- a. Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
- b. Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
- c. Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
- d. Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
- e. Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
- f. Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
- g. Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
- h. Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
- i. Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
- j. Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- k. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO i: To prepare graduate to success in technical or professional career in pharmaceutical industry and/ or institute and /or Health care system through excellent real time exposure to rigorous education.

PSO m: Understand the importance of applying pharmacodynamic and pharmacokinetic principles in formulation development and product development.

PSO n: To prepare the graduate to have foundation in science, formulation, technology, synthetic knowledge, discovery tools as per the requirement of Pharmaceutical sector.

PSO o: To strengthen the professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate pharmaceutical sciences issues to broader social context.

PSO p: To cultivate a sense of compliant partnering spirit in professional duties; especially in aligning with diverse health professionals and communities and to create awareness in society about the effective and safe use of medicines.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

A student after completing the B. Pharm course shall be called as a pharmacist and shall be capable of meeting requirements of manufacture & marketing of drugs in industry and to work in sectors of pharmacy practice.

PEO 1

For manufacturing, they will be in position to handle methods of drug manufacturing, drug selection, standardization, quality control, drug store management and such other requirements.

PEO 2

For practicing pharmacy, they will be qualified persons for drug dispensing, patient counseling and such other activities.

PEO 3

As they are also expected to provide service with globalization perspective, it is imperative that they have sound knowledge of entrepreneurship, leadership, and communication skills with ethical and moral attitudes.

PEO 4

To develop a sense of teamwork and awareness amongst students towards the importance of interdisciplinary approach for developing competence in solving complex problems in the area of Pharmaceutical Sciences.

PEO 5

To produce pharmacy graduates with strong fundamental concepts and high technical competence in pharmaceutical sciences who shall be able to use the tools in pharmaceutical arena for success.

PEO 6

For Pharmacy Practice, the student shall be trained and made required competent for providing effective medication therapy management, Maintain and improve professional performance and Contribute to improve effectiveness of the health-care system and public health.

MAPPING

| PO | a | b | c | d | e | f | g | h | i | j | k | PSO l | PSO m | PSO n | PSO o | PSO p |
|-------|---|---|---|---|---|---|---|---|---|---|---|-------|-------|-------|-------|-------|
| PEO 1 | X | X | X | X | | X | | | | | X | X | X | X | | |
| PEO 2 | X | | | | | X | | X | X | | X | X | | | | X |
| PEO 3 | | X | X | | X | X | X | X | | | X | X | | | X | X |
| PEO 4 | | X | X | X | X | X | | X | | X | X | | | X | X | |
| PEO 5 | X | X | X | X | X | | X | X | | X | X | X | X | X | X | |
| PEO 6 | X | | | | | X | X | X | X | X | X | X | | | | X |

FACULTY OF PHARMACY
PG PROGRAM (CBSS) – M.PHARM
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|----------------|---|--------------------------|---------------------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEO | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 25 | 75 | 100 |
| SEMESTER - I | | | | | | | | | | |
| 19MPA101T | Modern Pharmaceutical Analytical Techniques | 1,2 | a,c,d,h,j | 4 | - | - | 4 | 25 | 75 | 100 |
| 19MPA102T | Advanced Pharmaceutical Analysis | 1,2 | a,c,d,h,i,j | 4 | - | - | 4 | 25 | 75 | 100 |
| 19MPA103T | Pharmaceutical Validation | 1,2 | a,d,h,j | 4 | - | - | 4 | 25 | 75 | 100 |
| 19MPA104T | Food Analysis | 1,2,3 | a,b,h,i | 4 | - | - | 4 | 25 | 75 | 100 |
| 19MPA105P | Pharmaceutical Analysis Practical I | 1,2,4 | a,b,c,d,h,i,j | - | - | 12 | 6 | 50 | 100 | 150 |
| - | Seminar/Assignment | - | - | 7 | - | - | 4 | - | - | 100 |
| Semester Total | | | | 23 | - | 12 | 26 | 150 | 400 | 650 |
| SEMESTER – II | | | | | | | | | | |
| 19MPA201T | Advanced Instrumental Analysis | 1,2,4 | a,b,c,d,h,i,j | 4 | - | - | 4 | 25 | 75 | 100 |
| 19MPA202T | Modern Bio-Analytical Techniques | 1,2 | a,b,c,d,h,i,j | 4 | - | - | 4 | 25 | 75 | 100 |
| 19MPA203T | Quality Control and Quality Assurance | 1,2 | a,d,f,h,j | 4 | - | - | 4 | 25 | 75 | 100 |
| 19MPA204T | Herbal and Cosmetic analysis | 1,2 | a,b,c,d,f,h,j | 4 | - | - | 4 | 25 | 75 | 100 |
| 19MPA205P | Pharmaceutical Analysis Practical II | 1,2,4 | a,b,c,d,h,i,j | - | - | 12 | 6 | 50 | 100 | 150 |
| - | Seminar/Assignment | - | - | 7 | - | - | 4 | - | - | 100 |
| Semester Total | | | | 23 | - | 12 | 26 | 150 | 400 | 650 |
| SEMESTER - III | | | | | | | | | | |
| 19MPA301T | Research Methodology and Biostatistics* | 2,5 | b,c,j | 4 | - | - | 4 | 25 | 75 | 100 |
| - | Journal club | - | - | 1 | - | - | 1 | 25 | - | 25 |
| - | Discussion / Presentation (Proposal Presentation) | - | - | 2 | - | - | 2 | 50 | - | 50 |
| - | Research Work | 1,2,3,4,5 | a,b,c,d,e,f,g,h,i,j | 28 | - | - | 14 | - | 350 | 350 |
| Semester Total | | | | 35 | - | - | 21 | 100 | 425 | 525 |
| SEMESTER – IV | | | | | | | | | | |
| - | Journal club | - | - | 1 | - | - | 1 | 25 | - | 25 |
| - | Research work | 1,2,3,4,5 | a,b,c,d,e,f,g,h,i,j | 31 | - | - | 16 | 75 | - | 75 |
| - | Discussion / Final Presentation | - | - | 3 | - | - | 3 | - | 400 | 400 |
| Semester Total | | | | 35 | - | - | 20 | 100 | 400 | 500 |

* Non-University Exam

PROGRAMME OUTCOMES (PO)

- a. **Pharmacy Knowledge:** Demonstrate knowledge of the basic pharmaceutical sciences and the ability to acquire, manage and use current information for problem solving. Describe the synthesis, formulation, analysis, pharmacological, pharmacognostical, biotechnological and regulatory aspects of drugs and biopharmaceuticals. Identify the rules and regulations involved in the drug discovery and development, manufacture, distribution and sale of medicines.
- b. **Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines using modern tools.
- c. **Research:** An ability to independently carry out research /investigation and development work to solve practical problems. Apply critical thinking skills, including investigation, application, analysis, creativity, evaluation of information, data and documents related to research investigation.
- d. **Problem analysis:**Develop problem-based learning approach and analytical thinking in his/her academic and professional life. Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
- e. **Leadership qualities:** Demonstrate the ability to plan and implement professional activities. Act efficiently as a leader in the diverse areas of the profession.
- f. **Communication Skills:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions. Imbibe the skills of scientific communication and research writing.
- g. **The Pharmacist and society:**Apply the knowledge and skills gained through education to gain recognition in professional circle and society. Participate in healthcare initiatives to create awareness in society about the effective and safe use of medicines.
- h. **Professional Ethics:**Exercise ethical practices and moral values in personal and professional endeavors. Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
- i. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

- j. **Life-long learning:** Tackle professional challenges through lifelong learning attitude. Work in a team and participate in lifelong learning and continuous improvement in the profession.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO k: Understand a core and basic knowledge in different subjects of Pharmaceutical Sciences. To prepare graduate to success in technical or professional careers in various pharmaceutical industry and/or institute and /or Health care system through excellent real time exposure to rigorous education.

PSO l: Analyse the relationships among Pharmaceutics, Pharmaceutical and Medicinal Chemistry, Pharmacology and Pharmacognosy subjects. Understand the applications of Pharmaceutical Sciences in drug and formulation development, drug analysis, drug safety and efficacy in medicine.

PSO m: Perform procedures as per laboratory standards in the areas of Pharmaceutical Sciences.

PSO n: To strengthen the professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate pharmaceutical sciences issues to broader social context.

PSO o: To streams a lifelong career of personal and practicing professional growth with ethical codes and self-esteem for a highly productive career and to relate the concepts of Pharmaceutical Sciences towards serving the cause of the society.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1

To provide a comprehensive and advanced pharmaceutical education leading to M. Pharm. Degree.

PEO 2

To integrate pharmacy knowledge and skills with pharmaceutical research.

PEO 3

To develop pharmacists to contribute effectively in the social health care system.

PEO 4

To provide hands on training through state of art infrastructure to inculcate research aptitude in pharmaceutical sciences.

PEO 5

To inculcate leadership and entrepreneurship capabilities in future pharmacy professionals.

MAPPING

| PO | a | b | c | d | e | f | g | h | i | j | PSO k | PSO l | PSO m | PSO n | PSO o |
|-------|---|---|---|---|---|---|---|---|---|---|-------|-------|-------|-------|-------|
| PEO 1 | X | | | | | | X | X | | X | X | X | X | X | |
| PEO 2 | X | X | X | X | | X | | X | | X | X | X | X | X | X |
| PEO 3 | X | X | | X | | X | X | X | X | X | X | X | | X | X |
| PEO 4 | X | X | X | X | | | | | | X | X | X | X | X | X |
| PEO 5 | X | X | X | X | X | X | | X | X | X | | | | X | X |

FACULTY OF PHARMACY
PHARM.D PROGRAMME
(2019–2020 Batch and onwards)

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|---------------------------------------|--|--------------------------|-------|--------------------------|---|---------|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 30 | 70 | 100 |
| YEAR - I | | | | | | | | | | |
| 19PD101T | Human Anatomy and Physiology Theory | 2 | k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD102T | Pharmaceutics Theory | 3 | a | 2 | 1 | - | 3 | 30 | 70 | 100 |
| 19PD103T | Medicinal Biochemistry Theory | 2 | a,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD104T | Pharmaceutical Organic Chemistry Theory | 3 | a | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD105T | Pharmaceutical Inorganic Chemistry Theory | 2 | a | 2 | 1 | - | 3 | 30 | 70 | 100 |
| 19PD106RMT / 19PD106RBT | Remedial Mathematics/ Biology Theory | 6 | c/a | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD107P | Human Anatomy and Physiology Practical | 2 | b | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD108P | Pharmaceutics Practical | 3 | a,b | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD109P | Medicinal Biochemistry Practical | 2 | b,k | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD110P | Pharmaceutical Organic Chemistry Practical | 2 | b | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD111P | Pharmaceutical Inorganic Chemistry Practical | 2 | b | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD112RBP | Remedial Biology Practical | 2 | b | - | - | 3* | 2 | 30 | 70 | 100 |
| Total | | | | 16 | 6 | 15/ 18* | 34 | 360 | 840 | 1200 |
| *Applicable only for Remedial Biology | | | | | | | | | | |
| YEAR - II | | | | | | | | | | |
| 19PD201T | Pathophysiology Theory | 6 | b,f,i | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD202T | Pharmaceutical Microbiology Theory | 3 | k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD203T | Pharmacognosy & Phytopharmaceuticals Theory | 2 | a | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD204T | Pharmacology-I Theory | 3 | a.d,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD205T | Community Pharmacy Theory | 1,4 | a,f,i | 2 | 1 | - | 3 | 30 | 70 | 100 |
| 19PD206T | Pharmacotherapeutics-I Theory | 3 | a,f,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD207P | Pharmaceutical Microbiology Practical | 3 | a,b | - | - | 3 | 2 | 30 | 70 | 100 |

| | | | | | | | | | | |
|--------------|--|---|-------|-----------|----------|----------|-----------|------------|------------|------------|
| 19PD208P | Pharmacognosy & Phytopharmaceuticals Practical | 2 | a,b | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD209P | Pharmacotherapeutics-I Practical | 3 | b,c,g | - | - | 3 | 2 | 30 | 70 | 100 |
| Total | | | | 17 | 6 | 9 | 29 | 270 | 630 | 900 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|-------------|---|--------------------------|-----------|--------------------------|---|----|-----------|---------------|-----|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | | | |
| | | | | | | | | 30 | 70 | 100 |
| YEAR - III | | | | | | | | | | |
| 19PD301T | Pharmacology-II Theory | 3 | a,d,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD302T | Pharmaceutical Analysis Theory | 2 | c | 2 | 1 | - | 3 | 30 | 70 | 100 |
| 19PD303T | Pharmacotherapeutics-II Theory | 3 | a,f,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD304T | Pharmaceutical Jurisprudence Theory | 5 | a,e,g | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD305T | Medicinal Chemistry Theory | 2 | a,k | 2 | 1 | - | 3 | 30 | 70 | 100 |
| 19PD306T | Pharmaceutical Formulations Theory | 4 | a,c,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD307P | Pharmacology-II Practical | 3 | a,d,k | | | 3 | 2 | 30 | 70 | 100 |
| 19PD308P | Pharmaceutical Analysis Practical | 2 | c | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD309P | Pharmacotherapeutics-II Practical | 3 | a,f,k | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD310P | Medicinal Chemistry Practical | 2 | a,b | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD311P | Pharmaceutical Formulations Practical | 4 | a,c | - | - | 3 | 2 | 30 | 70 | 100 |
| Total | | | | 16 | 6 | 15 | 32 | 330 | 770 | 1100 |
| YEAR - IV | | | | | | | | | | |
| 19PD401T | Pharmacotherapeutics-III Theory | 3 | a,f,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD402T | Hospital Pharmacy Theory | 1,6 | a,f,g,i,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD403T | Clinical Pharmacy Theory | 1,6 | a,f,g,i,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD404T | Biostatistics & Research Methodology Theory | 2 | b,c,d,k | 2 | - | - | 2 | 30 | 70 | 100 |
| 19PD405T | Biopharmaceutics & Pharmacokinetics Theory | 5 | a,c,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD406T | Clinical Toxicology Theory | 3 | a,g,k,i | 2 | 1 | | 3 | 30 | 70 | 100 |
| 19PD407P | Pharmacotherapeutics-III Practical | 3 | a,f,k | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD408P | Hospital Pharmacy Practical | 1,6 | a,f,g,i,k | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD409P | Clinical Pharmacy Practical | 6 | a,f,g,i,k | - | - | 3 | 2 | 30 | 70 | 100 |
| 19PD410P | Biopharmaceutics & | 3,5 | a,c,k | - | - | 3 | 2 | 30 | 70 | 100 |

| | | | | | | | | | | |
|-------|----------------------------|--|--|----|---|----|----|-----|-----|------|
| | Pharmacokinetics Practical | | | | | | | | | |
| Total | | | | 16 | 5 | 12 | 29 | 300 | 700 | 1000 |

| Course code | Name of the course | Objectives and out comes | | Instruction hours / week | | | Credit(s) | Maximum Marks | | |
|-------------|---|--------------------------|-----------------------|--------------------------|---|----|-----------|---------------|-------|-------|
| | | PEOs | POs | L | T | P | | CIA | ESE | Total |
| | | | | | | | | 30 | 70 | 100 |
| YEAR V | | | | | | | | | | |
| 19PD501T | Clinical Research Theory | 1,4,6 | a,f,i,g,k | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD502T | Pharmacoepidemiology and Pharmacoeconomics Theory | 3,6 | a,d,j | 3 | 1 | - | 4 | 30 | 70 | 100 |
| 19PD503T | Clinical Pharmacokinetics & Pharmacotherapeutics Drug Monitoring Theory | 3,5 | a,c,k | 2 | 1 | - | 3 | 30 | 70 | 100 |
| 19PD504S | Clerkship * | 1,3,5,6 | c,e,f,g,h,i,k | - | 1 | - | 1 | 30 | 70 | 100 |
| 19PD505P | Project work (Six Months) | 1,3,5,6 | a,b,c,d,e,f,g,h,i,j,k | - | - | 20 | 20 | - | 100** | 100 |
| Total | | | | 8 | 4 | 20 | 32 | 120 | 380 | 500 |

*Attending ward rounds on daily basis

** 30 marks – Viva- Voice (oral)

70 marks – Thesis work

YEAR VI

Internship or residency training including postings in speciality units. Student should independently provide the clinical pharmacy services to the allotted wards.

- Six months in General Medicine department, and
- Two months each in three other speciality departments.

PROGRAM OUTCOMES (PO's)

- a. **Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and practice of pharmacy.
- b. **Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
- c. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
- d. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
- e. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
- f. **Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
- g. **Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

- h. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
- i. **The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
- j. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- k. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO i: Understand different classes of drugs, their mechanism of action, dynamics, kinetics, structure activity relationships, pathophysiology and pharmacotherapeutics of various diseases, ability to synthesize, develop and/or evaluate various pharmaceuticals and their formulations and cosmeceuticals products.

PSO m: Develop skills in qualitative and quantitative analysis of various pharmaceuticals. Acquire technical knowledge and hands on training on equipments, instruments and software used in the field of pharmaceutical sciences.

PSO n: To inculcate the practice of pharmacy and train pharmacists to play an important role in patient care, health and wellness and population-based care as members of the health care team

PSO o: To exhibit behaviors and values that are consistent with the trust given to the profession, professionalism in interactions with patients, professionalism in interactions with other healthcare providers, professionalism in interactions with society

PSO p: To strengthen the professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate pharmaceutical sciences issues to broader social context.

PSO q: To stream a lifelong career of personal and practicing professional growth with ethical codes and self-esteem.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: Synthesize population-based drug information to address patient medication adherence, prescribing patterns, and treatment protocol adherence to document issues, alert prescribers, design interventions, and assess intervention effectiveness.

PEO 2: To provide students with a strong and well defined concepts in the various fields of pharmaceutical sciences viz., pharmaceutics, pharmaceutical chemistry, pharmacology and pharmacognosy according to the requirement of pharmaceutical industries, community and hospital pharmacy and also to develop a sense of teamwork and awareness amongst students towards the importance of interdisciplinary approach for developing competence in solving complex problems in the area of Pharmaceutical Sciences.

PEO 3: Identify physicochemical properties of drug substances that affect solubility, pharmacodynamic and pharmacokinetic properties, pharmacologic actions, and stability when designing patient-specific care plans.

PEO 4: Formulate and implement a care plan in cooperation with patients and other healthcare providers based on established, evidence-based standards of practice; provide medication therapy management services for patients with acute & chronic health problems.

PEO 5: Integrate knowledge of chemical, physical, and biopharmaceutical principles to prepare safe and effective prescriptions (sterile and non-sterile) in conformity with all applicable federal and state laws and regulations.

PEO 6: Provide health care information regarding nutrition, lifestyle, and other non-drug measures that promote health or prevent the progression of a disease or medical condition. Demonstrate a comprehensive approach to practice and care, includes problem solving, educator, patient advocacy, interprofessional collaboration, cultural sensitivity, communication.

MAPPING

| PO | a | b | c | d | e | f | g | h | i | j | k | PSO l | PSO m | PSO n | PSO o | PSO p | PSO q |
|-------|---|---|---|---|---|---|---|---|---|---|---|-------|-------|-------|-------|-------|-------|
| PEO 1 | X | X | | X | X | X | X | X | X | | X | X | | X | X | X | X |
| PEO 2 | X | | X | | | | X | | | | X | X | X | | | X | X |
| PEO 3 | X | X | X | | | X | | | X | | X | X | X | | | | |
| PEO 4 | X | X | X | | | X | X | X | | X | X | | | X | X | X | X |
| PEO 5 | X | | | | | | X | X | X | X | X | | X | | X | | |

| | | | | | | | | | | | | | | | | | |
|-------|---|--|---|--|--|---|---|---|---|---|---|--|--|---|---|---|---|
| PEO 6 | X | | X | | | X | X | X | X | X | X | | | X | X | X | X |
|-------|---|--|---|--|--|---|---|---|---|---|---|--|--|---|---|---|---|