பகுதி – I,

தமிழ்பருவம் I

15LAU101 :

தமிழ்முதல்தாள்

5-H,5-C

பாடத்திட்டப்பொதுநோக்கம்

- கற்றல் வழி சிந்தனைத் திறனையும், கருத்து வெளிப்பாட்டுத் திறனையும், மேம்படுத்துதல்.
- ஆய்வுநோக்கைமேம்படுத்துதல்.
- இலக்கியங்கள் உணர்த்தும் வாழ்வின் நுட்பமான பகுதிகளை உணர்த்துதல்.
- மனித மனத்தினைப் பக்குவப்படுத்துதலில் இலக்கியம் தரும் பங்கினை உணர்த்துதல்.
- வளர்ந்து வரும் சமூகத்தில் அறஉணர்வு, பண்பாடு போன்றவை குறித்து அறிவூட்டல்.
- அரசுத் தேர்வுகளுக்கு மாணவர்களை ஆயத்தமாக்குதல்.

பாடத்திட்டப்பயன்விளைவு

- இந்தியகுடியுரிமைப்பணிமுதலானபோட்டித்தேர்வுகளில், விருப்பப்பாடமாகஇடம்பெறுகின்ற, 'தமிழ்இலக்கியவரலாறு' குறித்தமுழுமையானஅறிமுகம்பெற்றிருத்தல்.
- கல்வெட்டியல், ஓலைச்சுவடியியல்மற்றும்தொல்லியல்சார்ந்தஆவணத்தேடலுக்குரியஆய்வுமனப்பான்மையுடன், இலக்கியங்களைஅணுகுதல்.
- தமிழின்வளர்ச்சித்துறையாகிய, 'அறிவியல்தமிழ்'; ' (இணையதமிழ்' குறித்தபன்நோக்குஅணுகுமுறையிலானஆய்வுச்சிந்தனைமேம்பாடு.
- 4. வேலைவாய்ப்புக்குரியசுயதிறன்மேம்பாட்டுடன், படைப்பாக்கத்திறன்மேம்பாடும்பெற்றிருத்தல் .
- சமுதாயமற்றும்வாழ்வியல்மதிப்புகளைப்பேணுவதற்குக்கருவியாகஇலக்கியங்களைநாடுகின்றம னப்பான்மைவளர்ச்சி.
- 6. மொழிபெயப்புத்துறைசார்ந்தவேலைவாய்புத்திறன்பெற்றிருத்தல்

அலகு – I :இக்காலஇலக்கியம்

தத்துவம் : மகாகவிபாரதியார்– பகைவனுக்குஅருள்வாய்.

கவிஞர்ந.பிச்சமூர்த்தி– கிளிக்கூண்டு

இயற்கை : பாவேந்தர்பாரதிதாசன்– அழகின்சிரிப்பு – ஞாயிறு. சமுதாயம் :கவிக்கோஅப்துல்ரகுமான்– இன்றையநிலை அறிவியல் : கவிஞர்சிற்பிபாலசுப்பிரமணியன்– காலம். பெண்ணியம் :கவிஞர்சிவரமணி– வையகத்தைவெற்றிகொள்ள சூழலியல் :அன்பாதவன் - மரணம் காதல்:வைரமுத்து -காதல்உயில் தன்னம்பிக்கைபா.விஜய் - தன்னம்பிக்கை

அலகு – II :அறஇலக்கியம்

1. திருக்குறள் - தேர்ந்தெடுக்கப்பட்டகுறள்கள் 20

- 2. நான்மணிக்கடிகை தேர்ந்தெடுக்கப்பட்டஐந்துபாடல்கள்
- 3. திரிகடுகம் தேர்ந்தெடுக்கப்பட்டஐந்துபாடல்கள்

அலகு - III :சிற்றிலக்கியம்

- 1. நரிவிருத்தம் அறன்வலியுறுத்தல்
- 2. தமிழ்விடுதூது தமிழின்சிறப்புரைத்தல்
- 3. மதுரைமீனாட்சியம்மைப்பிள்ளைத்தமிழ்- தொடுக்கும்கடவுள்பழம்பாடல்

அலகு – IV :சிறுகதை

- 1. புதுமைப்பித்தன்-நிகும்பலை
- 2. தனுஷ்கோடிராமசாமி- கந்தகக்கிடங்கிலே
- 3. கந்தர்வன் துண்டு
- 4. வாஸந்தி- வடிகால்
- 5. சி.ஆர். ரவீந்திரன் வழுக்குமரம்

அலகு- V :மொழிப்பயிற்சி

- 1. விண்ணப்பங்கள்எழுதுதல்மற்றும்கடிதப்பயிற்சி
- 2. மொழிபெயர்ப்புப்பயிற்சி

பாடநூல்:கற்பகச்சோலை – தமிழ்ஏடு.கற்பகம்பல்கலைக்கழகத்தமிழ்த்துறைவெளியீடு.

Course Objectives

This course enables the students to learn

- To enable the learners to acquire English language skills at a faster pace.
- To introduce different kinds of literary works
- To familiarize different genres of Literature
- To instruct moral values through literature.
- To improvise their productive and receptive skills
- To strengthen the basic knowledge about grammar.

Course Outcomes(Cos)

On successful completion of this course, the students will be able to

- 1. Learn to reflect on the literary works and communicate flexibly.
- 2. Reading and comprehending literary works
- 3. Genres of literature to provide moral education
- 4. Develop communication skills in business environment
- 5. Interpersonal skills will be developed.
- 6. Betterment of language competence

UNIT I:

Prose: Google Guys (Extract) – Richard L Brandt **Poetry:** The Blind Pedlar – Osbert Sitwell **Short Story:** A Garden So Rich – Christie Craig **Vocabulary:** Prefixes, Antonyms, Sentence Completion **Grammar:** Articles, Adverbs, Pronouns **Composition:** Proverb Expansion

UNIT II:

Prose: Happiness 101 – Geeta Padmanabhan **Poetry:** An Old Woman – Arun Kolatkar**Vocabulary:** Suffixes, Analogies **Grammar:** Nouns, Adjectives **Composition:** DialogueWriting

UNIT III:

Prose: Structured Procrastination – JohnPerry
Short Story: The Umbrella Man – RoaldDahl
One-Act Play: The Boy Who Stopped Smiling – Ramu Ramanathan
Vocabulary: Synonyms, Euphemisms, Word Definitions
Grammar: Verbs, Conjunctions and Interjection, Indirect/Reported Speech

UNIT IV:

Poetry: No Sentence – Anjum Hassan **One-Act Play:** While the Auto Waits- O" Henry **Vocabulary:** Words Often Confused, Anagrams **Grammar:** Prepositions, Voice- Active and Passive **Composition:** Letter Writing- Informal

UNIT V:

Short Story: The Bird – Amar Jalil One-Act Play: The Cellphone Epidemic – Claudia I. Haas Vocabulary: Portmanteau Words, One Word Substitute Grammar: Questions, Pronunciation Composition: Letter Writing- Formal

Prescribed Texts:

Rao, G. Chandralekha and et al. Spring 2013. Emerald Publishers: Chennai.

Reference

Syamala, V. English for Communication. 2006. Emerald Publishers: Chennai

Course Objectives

This course enables the students to learn

- The concepts of essentials of matrices and its geometrical applications.
- The convergence and divergence of the series
- To find the roots for the different types of the equation and its applications.
- Binomial, Exponential and Logarithmic series theorems
- Rolle's theorem and its application
- To find the Multiple roots and integral roots of the equation

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Acquire the knowledge on Hamilton theorem.
- 2. Explore the concept of convergence and divergence of series.
- 3. Explain the concept of Binomial, Exponential and Logarithmic series theorems.
- 4. Evaluate the roots any equation.
- 5. Understand the relation between the roots and coefficients of an equation.
- 6. Use Roll's theorem to produce results on Integral and multiple roots.

UNIT I

Basic concept – Eigen values and eigen vectors- Properties of eigen values and eigen vectors – Diagonalisation of a matrix – Orthogonal Matrices – Cayley-Hamilton theorem (Statement only) – Verification.

UNIT II

Convergence and Divergence of series – Series of positive terms – Comparison tests – Cauchy"s condensation test - D"Alemberts Ratio test –Uniform convergence.

UNIT III

Binomial theorem – Statement only – Expansion of rational fraction- Exponential theorem – Statement – Summation of series-Logarithmic series theorem – Statement – Some important result – Summation of series.

UNIT IV

Theory of equations: Remainder theorem – Roots of an equation – Relations between the roots and coefficients of equation – Symmetric function of roots

UNIT V

Descarte"s rule of signs - Rolle"s theorem - Multiple roots - Integral roots.

TEXT BOOKS

1. Manicavachagam pillai., Natarajan.T., and Ganapathy.K.S, 2000. Algebra , Volume I ,S.Viswanathan printers and publishers Pvt Ltd, Madras. (For Unit- II,III,IV & V)

2. Veerarajan.T., 2007. Engineering Mathematics, Fourth edition ,Tata McGraw hill publishing company ltd, New Delhi.(For Unit-I)

REFERENCES

- 1. Goyal S.K, 2008. Algebra, Arihantprakasan, Meerut.
- 2. Sundaram V., Balasubramanian R., and K.A. Lakshminarayanan., 2000. Engineering Mathematics Vol. I, Vikas publishing house PVT., LTD, NewDelhi.
- 3. Manicavachagampillai., Natarajan.T., and Ganapathy., 1994. Algebra, Volume II, S.Viswanathan printers and publishers Pvt Ltd,Madras.

CALCULUS

Course Objectives

This course enables the students to learn

- The concepts of essentials of concavity, inflection points and its geometrical applications.
- The basic concepts in derivatives of Algebraic, Exponential and Logarithmic functions.
- Curvature and radius of Curvature in Cartesian and Parametric co-ordinates.
- The concepts of Evolutes and Envelopes.
- The basics of Definite Integrals and Methods of Integration.
- The Higher order derivatives and its applications in business, economics and life sciences.

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Evaluate the derivatives of Algebraic, Exponential, Logarithmic and Trigonometric functions.
- 2. Estimate the maxima and minima of any functions.
- 3. Apply the concept of radius of curvature and center of curvature in physical problems.
- 4. Calculate the definite integral by using the various methods of integration.
- 5. Evaluate the double and triple integrals of functions and change the order of integration in multiple variables
- 6.Describe the Beta and Gamma functions and evaluate multiple integral using Beta and Gamma functions.

UNIT I

Differential Calculus: Meaning of derivatives- Simple Differentiation of Algebraic, Exponential, Logarithmic and Trigonometric functions – Evaluation of First and Second order derivatives – Maxima and Minima of functions.

UNIT II

Curvature and Radius of curvature – Radius of curvature in Cartesian co-ordinates– Radius of curvature in parametric co-ordinates – Centre and circle of curvature– Evolutes and Envelopes

UNIT III

UNIT IV

Multiple Integral: Introduction – Evaluation of Double and Triple integrals – Change of order of integration from Cartesian coordinates to polar coordinates.

UNITV

Beta and Gamma integrals-their properties, relation between them- evaluation of multiple integrals using Beta and Gamma functions.

TEXT BOOKS

1. Narayanan.S and T.K.M. Pillai,2000.Calculus vol 1, Viswanathan Publishers, Chennai. (For Unit-I,II)

2.Narayanan.S and T.K.M. Pillai,2000.Calculus vol 2", Viswanathan Publishers,Chennai. (For Unit- III,IV&V)

REFERENCES

- 1. David V.Widder, 2008. Advanced Calculus, Prentice Hall of India pvtLtd, NewDelhi.
- 2. Shanthi Narayanan & P.K.Mittal,2008. Integral calculus, S.Chand&Co,NewDelhi.

15MMU103

ALLIED PHYSICS-I

Course Objectives

This course enables the students to learn

- To understand basic theories and experiments in Physics.
- To understand the fundamentals of physics.
- To educate and motivate the students in the field of science
- To learn about the electronic component like Diode, transistor etc.
- To learn the logic gates and its applications
- To understand the Polarization and coherence of the optical science.

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Describe Debroglie"s concept of matter waves, Debroglie"s wavelength and Thomson's experiment.
- 2. Design and construct Zener diode, Photo diode, Light emitting diode (LED).
- 3. Explain the concept of amplifiers, and perform amplifier as an adder, subtractor, differentiator and integrator.
- 4. Analyze binary, Octa, Hexa, decimal number systems and also relate ASCII and EBCDIC coding.
- 5. Develop Nand and Nor Gates as Universal Building Block and theorize De Morgan's theorem.
- 6. Explain Snell's Law, Planarization and coherence of optics.

UNIT – I

MODERN PHYSICS

Debroglie's concept of matter waves- Debroglie's wavelength –Characteristics of Debroglie's matter waves- calculation of Debroglie's wavelength of material particles like electrons –experimental study of matter waves-Thomson's experiment

UNIT – II

ANALOG ELECTRONICS

Construction, characteristics and applications of Zener diode, Photo diode, Light emitting diode (LED); working, efficiency, ripple factor and advantages of a full wave rectifier-Qualitative analysis of a common emitter amplifier; Phase reversal of the output voltage; advantage of common emitter amplification circuit.

UNIT - III AMPLIFIERS

Circuit symbol polarity conventions and virtual ground or summing point of an operational amplifier; characteristics of an ideal operational amplifier; amplifier as an adder, subtractor, differentiator and integrator.

UNIT – IV DIGITAL ELECTRONICS

Number systems-Binary Octal-Hexa decimal-ASCII and EBCDIC-Redundant coding for error detection and correction. Basic logic design using digital integrated circuits. Truth tables, Boolean algebra, Simple arithmetic circuits-exclusive half adder-full adder-half subtractor, full subtractor. NAND AND NOR As Universal Building Block-De Morgan"s theorem and its proof.

UNIT –V OPTICS

Reflection-Refraction-Snell ``slaw-Total internal reflection-Interference-Diffraction-Polarisation-Coherence

TEXT BOOKS

1. Murugesan. R., Modern Physics, S.Chand& CO, NewDelhi

2. Aruldhas G. and P.Rajagopal, "Modern Physics", Printice Hall of India, New Delhi, 2009

REFERENCES:

- 1. Rajam. J.B., Atomic Physics, S.Chand& Co, NewDelhi.
- 2. Gupta and Kumar, 2000, Solid State Physics Pragati Prakashan, Meerut.
- 3. Kittel. C., 1996, Introduction to Solid State Physics, 7TH Edition, John Willey & sons, NewDelhi.
- 4. Dekkar. A.J., 1900, Solid State Physics Macmillan India Ltd., New Delhi.

15MMU111

Course Objective

This course enables the students to learn

- To acquire basic understanding of laboratory technique and to educate and motivate the students in the field of Physics
- To allow the students to have a deep knowledge of fundamentals of optics.
- To gain practical knowledge by applying the experimental methods to correlate with the Physics theory.
- To learn the usage of electrical and optical systems for various measurements.
- To develop intellectual communication skills and discuss the basic principles of scientific concepts in a group.
- To apply the mathematical concepts/equations to obtain quantitative results

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Test the Young's Modulus non uniform bending and static cantilever.
- 2. Measure the Refractive Index of liquid prism and solid prism
- 3. Categorize the characteristics of junction diodes.
- 4. Calculate μ of a lens and Thickness of a thin wire
- 5. Apply the various procedures and techniques for the experiments.
- 6. Use the different measuring devices and meters to record the data with precision.

Any 8 Experiments

- 1. Young"s Modulus-Non Uniform bending-Opticlever
- 2. Young"s Modulus-Staticcantilever
- 3. Rigidity modulus- Dynamicmethod
- 4. Acceleration due to gravity-Compound pendulum
- 5. Refractive Index of a liquidprism-Spectrometer
- 6. Refractive Index of a solid prism (I-d) curve-Spectrometer
- 7. Co-efficient of thermal conductivity-Lee"s discmethod
- 8. Wavelength of spectral lines -Grating-minimum deviationmethod-Spectrometer.
- 9. Characteristics of a Junctiondiode
- 10. μ of a lens-Newton"s ringmethod
- 11. Thickness of a thin wire-Air wedgemethod
- 12. Frequency of tuning fork and density of solid and liquid Melde"sString

FOUNDATIONCOURSE-A (VALUEEDUCATION)

Course Objectives

This course enables the students to learn

- Teach and inculcate the importance of value based living.
- Give students a deeper understanding about the purpose of life.
- Teach and inculcate the essential qualities to become a good leader.
- The significance of being responsible citizens of the society.
- To inculcate the importance of harmonious living.
- To realize their role in the nation building.

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Create self-confidence, self-esteem and personality development.
- 2. Execute the goals of life and improve positive thinking.
- 3. Perform the roles and responsibility of citizens and practice effective time management techniques.
- 4. Know the value of healthy friendship and the know the importance of relationships.
- 5. Relate the spirituality with altruism and sacrifice.
- 6. Understand the importance of family relationship, self-control, sacrifice and truthfulness.

UNIT – I

Concept of Self, self-esteem and self-confidence. Concept of personality, determinants and disorgiansation of it. Personality development – meaning.

$\mathbf{UNIT} - \mathbf{II}$

Goal setting – meaning and importance; steps in goal setting Manners and Etiquette – meaning need and importance; means to improve. Positive thinking.

UNIT – III

Discipline – meaning. Concept of Roles and Responsibility Time Management – Meaning and steps for effective time management.

$\mathbf{UNIT} - \mathbf{IV}$

Interpersonal relationship – meaning and importance; means to improve it. Healthy friendship.

$\mathbf{UNIT} - \mathbf{V}$

Family Relationship importance of it; Means to improve. Spirituality – meaning. Its relationship with Altruism, sacrifice, self control, tolerance andtruthfulness.

TEXT BOOKS

1. Karpagam Academy of Higher Education, Study Material, 2015.

Course Objectives

This course enables the students to learn

- Encourage the all-round development of students by focusing on soft skills.
- Make the engineering students aware of the importance, the role and the content of soft skills through instruction, knowledge acquisition, demonstration and practice.
- Develop and nurture the soft skills of the students through individual and group activities.
- Expose students to right attitudinal and behavioral aspects and to build the same through activities
- To help formulate problem solving skills
- To create a desire to fulfill individual goals, and to educate students about unproductive thinking

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Solve Quantitative Aptitude questions and also solve problems on numbers, averages and ratios.
- 2. Understand the concept of verbal reasoning problem skills.
- 3. Understand the concept of blood relation, Image analysis and coding, decoding problems
- 4. Measure simple and compound interest of amounts and calculate profit and loss.
- 5. Describe active and passive voices and tense, subject and verb agreement.
- 6. Create the knowledge for goal setting and interpersonal skills.

<mark>UNIT - I</mark>

Introduction to Quantitative Aptitude, Speed Maths, Problems on Numbers, Averages, Ratios and Proportions, Problems on Ages

<mark>UNIT – II</mark>

Number Series, Blood Relation, Image Analysis, Direction Sense, Syllogism, Coding and Decoding

<mark>UNIT – III</mark>

Percentages, Data Interpretation, Profit and Loss, Simple Interest and Compound Interest

<mark>UNIT – IV</mark>

Parts of Speech, Tense, Subject Verb Agreement, Active and Passive Voice, Articles, Prepositions

UNIT – V

Conditional Clause, Degrees of Comparison, Goal Setting, Interpersonal Skills

பருவம் II 5-H,5-C

பாடத்திட்டப்பொதுநோக்கம்

- கற்றல் வழி சிந்தனைத் திறனையும், கருத்து வெளிப்பாட்டுத் திறனையும், மேம்படுத்துதல்.
- ஆய்வுநோக்கைமேம்படுத்துதல்.
- இலக்கியங்கள் உணர்த்தும் வாழ்வின் நுட்பமான பகுதிகளை உணர்த்துதல்.
- மனித மனத்தினைப் பக்குவப்படுத்துதலில் இலக்கியம் தரும் பங்கினை உணர்த்துதல்.
- வளர்ந்து வரும் சமூகத்தில் அறஉணர்வு, பண்பாடு போன்றவை குறித்து அறிவூட்டல்.
- அரசுத் தேர்வுகளுக்கு மாணவர்களை ஆயத்தமாக்குதல்.

பாடத்திட்டப்பயன்விளைவு

- இந்தியகுடியுரிமைப்பணிமுதலானபோட்டித்தேர்வுகளில், விருப்பப்பாடமாகஇடம்பெறுகின்ற, 'தமிழ்இலக்கியவரலாறு' குறித்தமுழுமையானஅறிமுகம்பெற்றிருத்தல்.
- கல்வெட்டியல், ஓலைச்சுவடியியல்மற்றும்தொல்லியல்சார்ந்தஆவணத்தேடலுக்குரியஆய்வுமனப்பான்மையுடன், இலக்கியங்களைஅணுகுதல்.
- தமிழின்வளர்ச்சித்துறையாகிய, 'அறிவியல்தமிழ்' ; 'இணையதமிழ்' குறித்தபன்நோக்குஅணுகுமுறையிலானஆய்வுச்சிந்தனைமேம்பாடு.
- 4. வேலைவாய்ப்புக்குரியசுயதிறன்மேம்பாட்டுடன், படைப்பாக்கத்திறன்மேம்பாடும்பெற்றிருத்தல்.
- சமுதாயமற்றும்வாழ்வியல்மதிப்புகளைப்பேணுவதற்குக்கருவியாகஇலக்கியங்களைநாடுகின்றம னப்பான்மைவளர்ச்சி.
- 6. மொழிபெயப்புத்துறைசார்ந்தவேலைவாய்புத்திறன்பெற்றிருத்தல்

அலகு - I : பக்திஇலக்கியம்

1.**சைவம் -**மூவர்தேவாரத்திலிருந்துதேர்ந்தெடுக்கப்பெற்ற15 பாடல்கள்

2.**வைணவம் –** ஆண்டாள்நாச்சியாரின்திருப்பாவையிலிருந்து 11 பாடல்கள்

அலகு– II:சங்கஇலக்கியம்

அ). எட்டுத்தொகை

நற்றிணை:1.இலைஇலபிடவம், **திணை** – முல்லை,

ஆசிரியர் – விழிக்கட்பேதைப்பெருங்கண்ணனார்.

2. **மடல்மாஊர்ந்து**, **திணை –**குறிஞ்சி, **ஆசிரியர் –** மடல்பாடியமாதங்கீரனார்.

குறுந்தொகை : 1.உள்ளார்கொல்லோ,திணை –பாலை, **ஆசிரியர்** – பெருங்கடுங்கோ. 2.**யாரினும்இனியன்,திணை** – மருதம்,

ஆசிரியர் – வடமவண்ணக்கன்தாமோதரனார்.

ஐங்குறுநூறு: 1.நுண்ணேர்புருவத்த,திணை – குறிஞ்சி, **ஆசிரியர் –** கபிலர். 2. அவறொறுந்தேரை,திணை – முல்லை, ஆசிரியர் *-*பேயனார்.

பதிற்றுப்பத்து– ததைந்தகாஞ்சி, ஆசிரியர் -பாலைக்கௌதமனார்.

பரிபாடல் - வையை- திரைஇரும்பனிப்பௌவம்,ஆசிரியர் -மையோடக்கோவனார்.

கலித்தொகை – கடும்புனல்கால்பட்டு,திணை – பாலை, **ஆசிரியர்** - பெருங்கடுங்கோ.

அகநானூறு - 1. ஆடுஅமைக்குயின்ற, திணை – குறிஞ்சி, ஆசிரியர் – கபிலர். 2.யான்எவன்செய்கோதோழி,திணை – பாலை,ஆசிரியர் –நோய்பாடியார். புறநானூறு- 1. சிறப்பில்சிதடுமுறுப்பில்,திணை –பொதுவியல், ஆசிரியர் –உறையூர்முதுகண்ணன்சாத்தனார். 2.இளையருமுதியரும்வேறுபுலம்படா – ஆசிரியர் –கயமனார்.

ஆ).பத்துப்பாட்டு- சிறுபாண்ஆற்றுப்படை – கடையெழுவள்ளல்களின்சிறப்பு, நல்லியக்கோடனின்சிறப்பு, ஈகைத்திறம்.

அலகு - III : காப்பியங்கள்

1.மணிமேகலை –பாத்திரம்பெற்றகாதை– <mark>தீவதிலகை, மணிமேகலைக்குச்சொல்லியது,</mark> சிறைக்கோட்டம்அறக்கோட்டமாக்கியகாதை – <mark>மணிமேகலை</mark> வேண்ட, மாவண்கிள்ளி, சிறைக்கோட்டத்தைஅறக்கோட்டமாக்கியது.

2.கம்பராமாயணம் - இலக்கியநயம்மிக்க, தேர்ந்தெடுக்கப்பெற்ற 41 பாடல்கள்.

அலகு - IV : கட்டுரைகள்

1.திருக்குறளில்மனிதவளமேலாண்மைக்கருத்துக்கள் - திருமிகுஹரிவிஜயலட்சுமி.

2.தமிழர்வளர்த்தநுண்கலைகள்: சிற்பமும்ஓவியமும் – தொ.மு. பாஸ்கரத்தொண்டைமான்.

3. சமயமும்தமிழும் –பேராசிரியர்அ.ச.ஞானசம்பந்தன்.

4.தமிழில்அறிவியல் – ஒருபார்வை - பேராசிரியர்சிவகுமார்.

5.இன்றையநெருக்கடிப்பிரச்சனைகள் - நீர்வளம் - முனைவர்ச. முத்துக்குமரன்.

அலகு - V : இலக்கணமும்மொழிப்பயிற்சியும்

1.எழுத்து, சொல், பொருள்இலக்கணஎழுத்துப்பயிற்சிகள் 2.பொதுக்கட்டுரைகள்

பாடநூல்:கற்பகச்சோலை – தமிழ்ஏடு.கற்பகம்பல்கலைக்கழகத்தமிழ்த்துறைவெளியீடு.

15ENU201

ENGLISH - II

Course Objectives

This course enables the students to learn

- To enable the learners to acquire English language skills through literature.
- To familiarize them with English literature.
- To acquire Grammar knowledge.
- To help learners imbibe cultural values.
- To acquire skill of making correct sentences.
- To reflect originality on the application of soft skills and express in writing their views.

Course Outcomes(Cos)

On successful completion of this course, the students will be able to

- 1. Learn to enjoy the ecstasy of literature.
- 2. The select literary pieces will develop the confidence level of the learners.
- 3. To get the social values.
- 4. To know the importance of communication
- 5. Get sound knowledge in English
- 6. Trained to communicate well for business purpose.

UNIT I

Prose: The Unexpected- Robert Lynd

Poetry: The Village Schoolmaster – Oliver Goldsmith **Short Story:** The Lion''s Share – Arnold Bennett **Vocabulary:** Homonyms **Grammar:** Irregular Verbs

UNIT II

Prose: Travel by Train – J. B. Priestly **Poetry:** The Gift of India – Sarojini Naidu **Grammar:** Sentence patterns **Composition:** Reading Comprehension

UNIT III

Prose: Women''s Education is Almost More Important than the Education of Boys and Men – Indira Gandhi Short Story: The Necklace – Guy De Maupassant One-Act Play: The Referee – W.H. Andrews and Geoffrey Dearmer Vocabulary: Similes Grammar: Discourse Markers Composition: Report Writing

UNIT IV

Poetry: Ozymandias – P.B. Shelley **One-Act Play:** The Pot of Broth- W.B. Yeats **Vocabulary:** Collective Nouns **Grammar:** Correction of Sentences **Composition:** Picture Reading

UNIT V

Short Story: The Silver Butterfly– Pearl S. Buck One-Act Play: The Bear – Anton Chekov Vocabulary: Acronyms Grammar: Question Tags Composition: Drafting Advertisement

Prescribed Texts

Wings of Communication 2014. Board of Directors. Emerald Publishers: Chennai Reference Syamala, V. English for Communication. 2006. Emerald Publishers: Chennai

15MMU201 DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

Course Objectives

This course enables the students to learn

- First order exact differential equations, linear homogeneous and non-homogeneous equations of higher order with constant coefficients.
- The complete solution of a non-homogeneous differential equation with constant coefficients by the method of undetermined coefficients.
- The basic concepts of Partial Differential Equations.
- How to solve Partial Differential Equations using Charpit's method.
- The transform of a periodic function.
- The applications of the inverse Laplace transform.

Course Outcomes (COs)

On successful completion of this course, the student will be able to

- 1. Solve any first order homogenious and non homogenious differential equations.
- 2. Evaluate Exact differential equations, Clairaut's form of equations and linear equations with constant coefficients.
- 3. Solve any patial differential equations and describe different integrals of pratial differential equations.
- 4. Estimate the standard types of partial differential equations and solve Larange's equations using Charpit's method.
- 5. Evaluate Laplace transforms of periodic functions and estimate integral using Laplace transforms.
- 6. Describe inverse Laplace transforms of periodic functions and solve Ode by using Laplace transforms.

UNIT I

Ordinary Differential equations : Definition – Formation of differential equations – Equations of first order and first degree – Variable separable – Homogeneous equations – Non homogeneous equations of first degree in X and Y – Linear equation – Bernoulli"sEquation.

UNIT II

Exact differential equations – First order higher degree equations – Clairaut"s form – Equations do not contain X explicitly – Equations do not contain Y explicitly – Equations Homogeneous in X and Y – Linear differential equations with constant coefficients.

UNIT III

Partial Differential Equations : Derivation of partial differential equations – Different integrals of partial differential equations - Standard types of first order equations – Equations reducible to the standard form – Lagrange''s equation – Charpit''smethod.

UNIT IV

Laplace transforms: Definition-Sufficient conditions for the existence of the Laplace Transform- Laplace Transform of periodic functions- Some general theorems-Evaluation of integrals using Laplace Transform.

UNIT V

Inverse Laplace Transforms: Solving ordinary differential equations with constant coefficients using Laplace Transforms-Solving a system of differential equations using Laplace Transforms .

TEXT BOOK

1.Narayanan S.andT.K.M.Pillai, S.Viswanathan, 1996. Calculus, Printers and Publishers Pvt. Ltd, New Delhi.

REFERENCES

1. SankaraRao.K, 2005.Introduction to Partial Differential Equations, Prentice Hall of India Private limited, NewDelhi.

2. Veerarajan.T, 2004.Partial Differential Equations and Integral Transforms,TataMc Graw - Hill Publishing Company limited, NewDelhi.

3. Earl A. Coddington, 2002. An introduction to Ordinary differential Equations, Prentice Hallof India Private limited, NewDelhi.

4. Somasundaram.D, 2002.Ordinary differential Equations - A first course, Narosa Publishing House, New Delhi.

		Semester – II
		L T PC
15MMU202	TRIGONOMETRY	4 1 0 4

Course Objectives

This course enables the students to learn

- The concepts of exponential, logarithmic, trigonometric functions and their applications.
- The ability to use inverse functions to solve equations, specifically to solve exponential and trigonometric equations.
- Summation of Trigonometric series
- Gregory series, Euler series, Maclarines series and Rutherford series
- To evaluate the six trigonometric functions for a given angle
- To apply the definitions of angle of elevation and angle of depression in real life applications

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Describe the expansions of $sinn\theta$, $cosn\theta$ and $tan n\theta$ in terms of $tan\theta$.
- 2. Evaluate the powers of sin and cosine function in terms of θ and also describe the expansion of powers of sine and cosine functions.
- 3. Explain about Hyperbolic functions and inverse hyperbolic function.
- 4. Discuss the logarithms of complex quantities and real, imaginary part of exponential functions.
- 5. Estimate the sum of any series of trigonometric functions.
- 6. Explain Gregory series, Euler series and Maclarine series, etc.

<mark>UNIT-I</mark>

Expansions of $\cos n\theta$, $\sin n\theta$ - Expansion of $\tan n\theta$ in terms of $\tan \theta$ - Expansion of $\tan(A+B+C+...)$ - Formation of Equations.

<mark>UNIT-II</mark>

Powers of sines and cosines of θ in terms of functions of multiples of θ - expansions of sin θ and cos θ in a series of ascending powers of θ - Expansion of cosⁿ θ , sinⁿ θ and sin^m θ cosⁿ θ

UNIT-III

Hyperbolic functions: Definition - Relation between Hyperbolic Functions -Periods of hyperbolic functions – Separation into real and imaginary parts – Inverse hyperbolic function.

UNIT-IV

Logarithms of complex quantities: Express log(x+iy) in the form (A+iB) – The general exponential function – Real and imaginary part of Exponential functions.

<mark>UNIT-V</mark>

Summation of Trigonometric Series: Method of Differences - Gregory Series - Euler Series-Maclarine series and Rutherford series.

TEXT BOOK

1.Dr.Nigam.H.N., 1996. Trigonometry, Krishna Prakashan Media Pvt.Ltd, Meerut.

REFERENCES

1. Vittal.P.R. 2004. Trigonometry, Margham Publications, Chennai.

2. Veerarajan.T., Fourth edition 2007. Engineering Mathematics, Tata McGraw hill publishing company ltd, NewDelhi.

3. Sudha.S., 1998. Algebra Analytical Geometry(2D) and Trigonometry, Emerald Printing House Pvt. Ltd, Chennai.

4. Kandasamy P., Thilagavathy K., and K.Gunavathy., 2009. Engineering Mathematics, S.Chand& company Ltd, Ram Nagar, New Delhi-110055.

15MMU203

ALLIEDPHYSICS-II

Course Objectives

This course enables the students to learn

- Basic knowledge on material properties.
- Magnetism and digital electronics.
- To educate and motivate the students in the field of science.
- Given the unit cell for some crystal structure, be able to draw the atomic packing arrangement for a specific crystallographic plane.
- Explain the use of X-ray diffraction measurements in determining crystalline structures.
- The Photo electric effect and its applications.

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Explain about Bending of beams, Uniform and non-uniform bendings.
- 2. Estimate Torsion and Rigidity by static and dynamic methods.
- 3. Measure the surface tension surface energy and Vapour pressure over a surface.
- 4. Demonstrate Photo electric effect and Einstein's photo electric equation and apply photo electric in Nuclear physics.
- 5. Identify Raman effect, Raman shift and describe laser Raman spectrometer.
- 6. Understand the all concepts of solar physics such as: solar constant measurement of solar radiations by Pyroheliometer and Pyranometer

UNIT-I

ELASTICITY OF SOLIDS

Elastic constants of an isotropic solid - Relations connecting them - Poisson''s ratio - Bending of beams - Uniform and non-uniform bending - Bending moment of a bent beam - cantilever - Static and dynamic methods - Torsion in a wire - Rigidity modulus determination by Static and dynamic methods.

UNIT-II

SURFACE TENSION

Surface tension and Surface energy- Pressure difference across a spherical surface- Pressure difference across a curved surface - Angle of contact - Angle of contact for water in a glass - Vapour pressure over a flat and curved surface - Variation of Surface tension with temperature - Jaegar's method - Quinke's method.

UNIT-III

MODERN PHYSICS: Photo electric effect – Einstein"s photo electric equation –verification of Einstein"s photo electric equation by Millican"s experiment – photo electric cells – applications Nuclear physics :characteristicsof nuclear forces – nuclear structure by liquid drop model– Binding energy – mass defect – particle accelerators – cyclotron and betatron nuclear Fission and nuclear Fusion.

UNIT-IV

LASER PHYSICS: Purity of spectral lines – Coherence length and time – spontaneous and induced emissions – population inversion – meta stable state – conditions for laser actions – Ruby laser – Helium – neon laser – applications of lasers – Raman effect – Raman shift – stokes and anti stokes lines – Laser RamanSpectrometer.

<mark>UNIT-V</mark>

SOLAR PHYSICS: solar constant – measurement of solar radiations by Pyroheliometer and Pyranometer – general applications of solar energy – flat–plate collector - box type cooker - solar water heaters – solar photo – votaic cells – general applications of solar cells.

TEXT BOOKS

- 1. Murugesan. R., Modern Physics, S.Chand& CO, NewDelhi
- 2. Aruldhas and P.Rajagopal, Modern Physics, Prentice Hall of India, NewDelhi.

REFERENCES:

- 1. Mathur. D.S., 2003, Elements of properties of matter Shyamlal Charitable Trust, NewDelhi.
- 2. Brijlal and N. Subramanyam, 2004, Properties of matter, S. Chand & Company, NewDelhi.
- 3. Rai. G.D, Solar energy and its utilization, S.Chand& Co., NewDelhi.
- 4. Rajam. J.B., Atomic Physics, S.Chand& Co, NewDelhi

Course Objective

This course enables the students to learn

- To enhance the students to understand the concepts in integrated chips.
- To understand the optical and electronic properties of solids through experimentations.
- To learn the usage of electrical and optical systems for various measurements.
- To develop intellectual communication skills and discuss the basic principles of scientific concepts in a group.
- To enable the students to gain knowledge on the basic principles of applied electronics
- To identify the strength, the given objects

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Perform basic experiments in mechanics, heat and electricity and analyze the data.
- 2. Acquire engineering skills and practical knowledge, which help the student in their everyday life.
- 3. Know the physical principles and applications of Electronics.
- 4. Apply the various procedures and techniques for the experiments.
- 5. Apply the mathematical concepts/equations to obtain quantitative results.
- 6. Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.

ANY TEN EXPERIMENTS

- 1. Field Intensity-Circular coil- Vibration magnetometer
- 2. Co-efficient of thermal conductivity-Lee"s discmethod
- 3. Refractive Index of a prism (I-I")curve-Spectrometer
- 4. Moment of a magnet-Circular coil-DeflectionMagnetometer
- 5. Temperature coefficient of resistance of a thermistor-Post officebox
- 6. Comparison of viscosities of twoliquids
- 7. Study of logic gates usingIC"s
- 8. Study of NOR gate as Universal buildingblock.
- 9. Study of NAND gate as Universal buildingblock.
- 10. Verification of Basic logic gates using discrete components.
- 11. Determination of Cauchy"s constant Spectrometer
- 12. AC frequency -Sonometer

15FCB201 FOUNDATION COURSE-B (ENVIRONMENTALSCIENCE)

Course Objectives

This course enables the students to learn

- 1. The study creates awareness among the people to know about various renewable and non renewable resources of the region, enables environmentally literate citizens (by knowing the environmental acts, rights, rules, legislation, etc.) to make appropriate judgments and decisions for the protection and improvement of theearth.
- 2. Creating the awareness about environmental problems amongpeople.
- 3. Developing an attitude of concern for theenvironment.
- 4. Motivating public to participate in environment protection and improvement.
- 5. About the interaction of human society (urban sprawl, energy use/generation, resource consumption and economics) with the Earth's systems.
- 6. To give students an understanding of how science and the scientific method work to address environmental problems

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Establish the Natural resources, Forest resources and water resources, etc.
- 2. Identify the cause and effects of pollution and measure the pollution in air, water, noise and soil.
- 3. Inspect the biodiversity and its conversation and threats to biodiversity.
- 4. Evaluate the social issues, urban problems and manage sustainable utilization of natural resources.
- 5. Analyze the ethics of environmental, environmental education, social justice and human heritage.
- 6. Sketch the preserving resources for future generation, common property resources, Ecology and its uses.

UNIT - I: Eco system and natural resources: Environment – Definition – components - Ecosystem - Definition, Concept, Scope, importance, structure and functions of ecosystem. Energy flow, Ecological succession. Food chains and food webs. Classification of ecosystem. Natural resources: Forest resources; waterresources

UNIT - II: Environmental pollution: Cause, effects and control measures of Air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution and nuclear hazards pollution. Solid waste management.

UNIT - III: Biodiversity and its conservation: Introduction- Definition, genetic, species and ecosystem diversity, biogeographical classification of India- Value of biodiversity: Consumptive, productive uses; social, ethical, aesthetic and option values. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.

UNIT - **IV:** Social issues and the environment: Urban problems related to energy- water conservation and management -Rain water harvesting- water shed management. Resettlement and Rehabitilisaion. Natural resources and associated problems and sustainable utilization. EnvironmentalEducation.

UNIT - V: Environment ethics: Environmental Ethics - Gender equity, ethical basis of environment education and awareness, conservation ethic and traditional value systems of India. Valuing nature, cultures, social justice, Human heritage, equitable use of resources, preserving resources for future generation, common property resources, Ecology and its uses and its degradation, Introduction to Environmental Protection Act (EPA).

TEXT BOOKS

- 1. Agarwal, K.M., P.K. Sikdar and S.C. Deb, 2002. A Text Book of Environment, Mac Millan India Ltd, Kolkatta,India.
- 2. Kotwal, P.C. and S. Banerjee, 2002. Biodiversity Conservation In Managed forest and protected areas, Agrobios, India.

REFERENCES

- Singh, M.P., B.S. Singh and Soma S. Dey, 2004. Conservation of Biodiversity and Natural Resources. Daya Publishing House, Delhi.
- 2. Uberoi, N.K., 2005. Environmental Studies, Excel Books Publications, New Delhi, India.
- 3. Shaw, R and Krishnamurthy, R.R. 2009. Disaster management: global challenges and local solutions Universities Press (India) Private Ltd,Hyderabad.
- 4. Sorokin Pitirim. A, 1942. Man and Society In Calamity. New York: Dutton, 1942
- 5. Patrick L.Abbott, 2008. Natural Disasters, Mc Graw Hill, New York. Page:1-7.

Semester-II L T PC 2 0 0 1

15SSD201

SOFTSKILLDEVELOPMENT-I

Course Objectives

This course enables the students to learn

- 1. To impact knowledge on both Aptitude and Soft skills to thestudents
- 2. To critically evaluate and demonstrate various principles involved in solving mathematical problems and
- 3. To adopt new and faster methods of calculations.
- 4. Reinforcing competencies in soft skills which are crucial in a social setting
- 5. To help increase a persons' self-esteem, to develop cognitive skills.
- To making appropriate and responsible decisions, to create a desire to fulfill individual goals 6.

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Solve Quantitative Aptitude questions and also solve problems on numbers, averages and ratios.
- 2. Understand the concept of verbal reasoning problem skills.
- 3. Understand the concept of blood relation, Image analysis and coding, decoding problems
- 4. Measure simple and compound interest of amounts and calculate profit and loss.
- 5. Describe active and passive voices and tense, subject and verb agreement.
- 6. Create the knowledge for goal setting and interpersonal skills.

UNIT - I

Introduction to Quantitative Aptitude, Speed Maths, Problems on Numbers, Averages, Ratios and Proportions, Problems on Ages

UNIT - II

Number Series, Blood Relation, Image Analysis, Direction Sense, Syllogism, Coding and Decoding

UNIT – III

Percentages, Data Interpretation, Profit and Loss, Simple Interest and Compound Interest

UNIT – IV

Parts of Speech, Tense, Subject Verb Agreement, Active and Passive Voice, Articles, Prepositions

UNIT - V

Conditional Clause, Degrees of Comparison, Goal Setting, Interpersonal Skills

Course Objectives:

- To develop confidence to respond in English during situations where the use of English is imperative.
- To develop fluency in actual conversation in the English language.
- To develop speech skills necessary for confident and intelligent participations in GroupDiscussions and develop skills related to teamwork in work places.
- To develop confidence to respond in English during situations where the use of English is imperative.
- To develop fluency in actual conversation in the English language.
- To develop self confidence in Group discussion, meeting and special addresses.

Course Outcomes:

- 1. Students learnt the basics and purposes of listening skill.
- 2. Students understand importance of speaking.
- 3. Students developed the speaking skills on telephone, business and also in travel
- 4. Learnt some effective vocabulary learning strategies.
- 5. Students will able to communicate clearly and effectively and handle their day to day affairs well with their knowledge of language skills.
- 6. Able to understand the knowledge about business communication

UNIT I

Listening: Listening comprehension – Listening for Specific Information –Note Taking – Interpreting Charts and Diagrams.

UNIT II

Speaking: Essentials of effective communication – Greeting and Introducing – Making requests – Asking for permission – Giving and Denying Permission – Offering and Accepting Help – Asking for and Declining Help – Giving Instructions and Orders - Talking about likes and dislikes.

Telephone Skills – Understanding telephone conversation – handling calls – leaving messages – making requests - giving instructions and orders

Discussion Skills - Giving your opinion - agreeing and disagreeing - Making suggestions -

Interrupting – questioning – reporting – Dealing with questions.

(Completing dialogues)

UNIT III

Reading: Reading – Reading with a purpose –Skimming and Scanning – locating main points – reading critically – Sequencing of sentences – Reading comprehension.

UNIT IV

Writing: Paragraph Writing – Descriptive and Narrative. Safety Instructions/ Suggestions. Expansion of Abbreviations – Spellings- Report writing.

Translation- Translating short sentences and passages from English to Tamil and from Tamil to English.

UNIT V

Vocabulary: Improve English vocabulary: Synonyms – Antonyms – Prefixes – Suffixes – Idioms – Collocations – Different types of English – British and American (Choose the best answer type from a database of 50 words each for each topic)Functional Grammar: Forming questions, getting answers – Articles – Parts of Speech – Punctuation – Common mistakes in English (Homophones)(Exercise based)

Reference Books

Language in Use: Kenneth Anderson, Cambridge University Press.

Study Speaking: A course in Spoken English for Academic Purpose: Kenneth Anderson, Joan MacLean and Tony Lynch, Cambridge University Press, 2008.

Spoken English Part I & II (for Tamil speakers), Orient Longman Pvt. Ltd.

Dr. J. John Love Joy, Dr.FrancisM.Peter S.J. "Lets Communicate – Basic English for Everyone", Vaigarai Publications, 1st edition, Dindigul 2007.

15MMU301

MECHANICS

Course Objectives

This course enables the students to learn

- The strong foundation in the concepts of mechanics to know how the friction is regulating the motion of objects.
- About the motion of particles under the influence of various forces like gravitational force, central force, impulsive force etc., which plays an essential role in Applied Mathematics.
- The application of geometric and trigonometric properties in equilibrium and motion of particles.
- The basic concepts of Moments, Friction and Motions.
- To develop the capacity to predict the effects of force and motion while carrying out the creative design functions of engineering.
- To help the student develop this ability to visualize, which is so vital to problem formulation

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Describe the Parallelogram, analytical expression, perpendicular triangle and polygon of forces.
- 2. Evaluate the resultant of parallel forces of two equal and unequal forces.
- 3. Measure the angle, coefficient and cone of friction and calculate moments of force.
- 4. Explain the concept of equation of motions and moment momentum, angular momentum in any physical situation.
- 5. Inspect the harmonic motions in straight line and two parallel lines and also express the simple and compound problem.
- 6. Apply the impact of an elastic sphere with a smooth fixed plane.
- 7. Evaluate the impacts of elastic sphere with a smooth fixed palne.

UNIT I

Force acting at a Point: Parallelogram of Force – Analytical Expression for the Resultant of two forces acting at a point – Perpendicular Triangle of Forces – Converse of Triangle of Force – Polygon of Forces Parallel Forces- To find the Resultant of two like parallel forces acting on a Rigid body – To find Resultant of two unlike and unequal Forces acting on a Rigid body – Resultant of number of parallel forces acting on a rigid body – Condition of Equilibrium of three Coplanar parallel forces – Center of two parallel forces.

UNIT II

Moments and Friction: Moment of a force – physical significance of moment of force – Geometrical representation of moment – sign and unit of moment – Varigons Theorem of moment- principle of moment. Friction – Laws of Friction – Angle, coefficient of Friction, cone of friction.

UNIT III

Coplanar motion : Equations of motion in polar coordinates- moment of momentum – angular momentum . Central orbits: Differential equation of a central orbit in polar coordinates- Apse -circular and elliptic orbits-Kepler's laws of planetarymotion.

<mark>UNIT IV</mark>

Simple harmonic motion : Amplitude, periodic time, phase – composition of two simple harmonic motions of the same period in a straight line and in two perpendicular lines – Simple harmonic motion as the projection of uniform circular motion – The simple pendulum – The seconds pendulum-Compound Pendulum.

UNIT V

Impact : Impulsive force – Equations of motion for impulsive forces – motion of a shot and gun – Impact of water on a surface – Oblique impact of two elastic spheres – Impact of an elastic sphere with a smooth fixed plane.

TEXT BOOKS

1. Venkataraman. M.K., 1998 . Statics, Agasthiar Publications, Trichy.(For Unit - I, II & III)

2. Venkataraman. M.K., 2000. Dynamics, Agasthiar Publications, Trichy. (For Unit – IV & V)

REFERENCES

- 1. DharmapadamA .V., 1993. Dynamics, S.Viswanathan printers and publishersPvt Ltd,Chennai-2..
- 2. Duraipandian, 2000. Text book of Dynamics, Emerald publishers, Chennai-2
- 3. Duaripandian.P.,LakshmiDuraipandian.,Muthamizh Jaya Pragasam, 2011.Mechanics,S.Chand& Company Ltd,NewDelhi.

Course Objective:

This course enables the students to learn

- The basic concepts of primary data and secondary data.
- Basic concepts in central tendency and statistical measures
- Commonly used probability distributions (both discrete and continuous)
- Central Limit theorem and their applications in various disciplines.
- To analyze forces and moments in two and three dimensions due to concentrated and distributed forces in various systems such as beams, frames and trusses.
- To understand the procedure for analysis of static objects; concepts of force, moment, and mechanical equilibrium.

Course Outcomes (COs)

On successful completion of this course, the student will be able to

- 1. Perform in primary and secondary data and illustrate in Bar and Pie diagrams.
- 2. Evaluate the mean, median and mode of any given data also evaluate quartiles and deviations.
- 3. Describe the Correlation, Rank Correlation and Regression of two variables.
- 4. Understand the basic concept of test of significance of z-test, t-test and chi-square test.
- 5. Compute probabilities and conditional probabilities in appropriate ways.
- 6. Derive the Binomial and Poisson distribution.

UNIT I

Meaning and definition of statistics – sources of data – collection of data – primary and secondary data - methods of primary data collection –sources of secondary data – Classification of data. Diagrammatic representation– Bar diagram and Pie diagram – Graphic representation – Histogram, Frequency distribution, Ogives.

UNIT II

Measures of central tendency - Arithmetic Mean, Median, Mode. Measures of dispersion – Range, Quartile deviation, Standard deviation and Coefficient of variation.

UNIT III

Correlation – meaning and definition – scatter diagram – Pearson's correlation coefficient Computation and interpretation – Rank correlation.

Regression: Regression in two variables – Regression coefficient problems.

UNIT IV

Test of Significance: Basic concepts – Z-test for two means – Small sample tests- t- test for single mean, two means – Chi Square Test.

<mark>UNIT V</mark>

Probability (Concept only) – Binomial distribution – Poisson Distribution – Normal distribution– Exponential Distribution (No derivations) and simple problems.

TEXT BOOK

1. Pillai R.S.N., and Bagavathi V., 2002., Statistics , S. Chand & Company Ltd, New Delhi.

REFERENCES

- 1. Navnitham P.A , 2004. Business Mathematics And Statistics, Jai Publications, Trichy,
- 2. Gupta S.P., 2001. Statistical methods, Sultan Chand & Sons, NewDelhi.
- 3. Gupta S.C., and Kapoor V.K., 1999. Fundamentals of Mathematical statistics, Sultan Chand & Sons, Educational Publishers, New Delhi.
- 4. Dr.P.N.Arora, 1997, A foundation course statistics, S.chand& Company Ltd, NewDelhi.

Course Objectives

This course enables the students to learn

- It is well recognized nowadays the importance of Statistics as an indispensable tool for obtaining and spreading information.
- Importance has been enhanced by the use of computational resources and particularly the software SPSS, that showed, during the last decades, to be an effective tool for treating and analyzing statistical data.
- Ability to use SPSS procedures in handling data files and performing statistical analysis, and to interpret the outputs provided by the program.
- Acquiring sensitivity and critical thinking towards arguments and conclusions based on statistical studies.
- Understanding the fundamental principles underlying descriptive and inferential statistical reasoning; ability to perform current statistical analysis, selecting the most appropriate techniques and methods for collecting and processing statistical data.
- To Recognise some of the pitfalls associated with statistical analysis.

Course Outcomes (COs)

On successful completion of this course, the student will be able to

- 1. Describe and classify data using statistical terminology.
- 2. Apply SPSS Package, to find mean, mode, median for any data.
- 3. Test the significance of hypothesis using Z and Chi-square test.
- 4. Calculate the rank correlation in united and tied ranks.
- 5. Design a program for analyzing data in SPSS package.
- 6. Know when to use basic statistical hypothesis tests (t-tests, chi-squared tests, correlation) and how to carry out these tests using SPSS.
- 1. Using SPSS Package, draw bar diagram and pie diagram for discreteseries.
- 2. Using SPSS Package, calculate the Mean for individual, discrete and continuousseries.
- 3. Using SPSS Package, calculate the Median for individual and discreteseries.
- 4. Using SPSS Package, calculate the Mode for individual and discreteseries.
- 5. Using SPSS Package, calculate the Standarddeviation.
- 6. Using SPSS Package, calculate the Karl Pearson"sCorrelation.
- 7. Using SPSS Package, calculate the Rank Correlation Coefficient for UntiedRank.
- 8. Using SPSS Package, calculate the Rank Correlation Coefficient for TiedRank.
- 9. Using SPSS Package, test the significance of hypothesis using Z-test.
- 10. Using SPSS Package, test the significance of hypothesis using Chi SquareTest.

Course Objectives

15MMU303A

This course enables the students to

- Understand fundamental accounting concepts and principles.
- Develop the capability to perform the basic accounting functions: the recognition, valuation, measurement and recording of the most common business transactions and the preparation of accounting statements.
- Deals with the "Fundamental Issues in Accounting" and comprises.
- Enable students to describe how people analyze the corporate financial under different conditions and understand why people describe the financial statements in different manner.
- Demonstrate an understanding of accounting principles
- Balance ledger accounts, prepare a trial balance, prepare a work sheet.

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. Use the fundamental accounting equation and book keeping to analyze the effect of business transactions on an organization's accounting records and financial statements.
- 2. Enrich the ability to create subsidiary books, sales book and etc.
- 3. Develop the ability to use accounting concepts, principles, and frameworks to analyze and effectively communicate information to a variety of audiences.
- 4. Promote the ability to use accounting information to solve a variety of business problems.
- 5. Demonstrate the applicability of the concept of Accounting to understand the managerial Decisions and financial statements.
- 6. Apply the Financial Statement Analysis associate with Financial Data in the organization.

UNIT I

Accounting – Definition- Fundamentals of Book Keeping – Branches of Accounting – Nature of Accounts - Accounting Concepts and Conventions – Journal –Ledger.

UNIT II

Subsidiary books – Introduction – Types of subsidiary books - purchases book - sales book - returns book - cash book - single column cash book – Two column cash book - Three column Cash book - petty cash book

UNIT III

Trial balance - Errors and their rectification - Final accounts of a sole trader with adjustments - Trading and Profit and Loss Account - Balance Sheet – Difference between Profit and Loss Account and Balance Sheet.

UNIT IV

Depreciation- Definition- Methods of depreciation- straight line method- written down value methodannuity value method- sinking fund method- provisions and reserves
UNIT V

Accounts for Non Profit organization- Receipts and Payments and income and expenditure account and Balance sheet – Difference between Receipts and Payments and income and expenditure account and Balancesheet

Note: Distribution of Marks between problems and theory shall be 75% and 25%.

TEXT BOOK

1. N.Vinayakam, P.L.Maniam and K.L.Nagarajan , (2012)PrinciplesofAccountancyNew Delhi .S.Chand& CompanyLtd.

- 1. S. P. Jain & K. L. Narang, 2010, Advanced Accountancy, Sultan Chand & Sons. New Delhi
- 2. T.S.Grewal,(2011)Introduction to Accountancy, New Delhi S.Chand& CompanyLtd.
- 3. R.L.Gupta, V.K.Gupta and M.C.Shukla, 2010, New Delhi Financial Accounting, Sultan Chand .
- 4. T.S.Grewal, S.C.Gupta and S.P.Jain, 2010, New Delhi Advanced Accountancy, Sultan Chand .
- 5. K.L.Narang and S.N.Maheswari ,2010, New Delhi Advanced Accountancy-Kalyani Publishers.

ALLIEDELECTIVE-1 INDIANBANKING

Course Objectives

This course enables the students to

- Principles and Practices of banking represents the origin or banks, classification functions, Types of bank accounts, service banking and Indian money market.
- This paper provides the functioning and process of various banks.
- Fundamental knowledge of banking as service and bank as an institution which would from the basis for courses related to more areas of banking and insurance
- To have knowledge of banking, insurance and capital market law besides fundamental legal knowledge
- To introduce the students to the basic concept of banking as a financial intermediation service and bank as a financial institution.
- Know basics of International Banking and Finance

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. Know the Banking system and modern commercial Banks
- 2. Describe the services of Banking
- 3. Measure the qualitative and quantitative of credits
- 4. Analyze the feature and deficiencies of money market.
- 5. Understand the banking system in rural and commercial banks.
- 6. To express their opinions about banking and insurance in written and oral form, based on the basic knowledge and skills they acquire.

<mark>UNIT I</mark>

Banks: Origin of Banks – Definition of Bank – Classification of Banks – Banking system – Unit Banking – Branch Banking – Functions of Modern Commercial Banks – Credit Creation by Commercial Banks.

<mark>UNIT II</mark>

Services Banking: Automated Teller Machine – Merchant Banking – Mutual Fund – Factoring service – Customer service – Credit card, debit card – E-banking, Privatization of commercial banks – Place of private sector banks in India.

<mark>UNIT III</mark>

Central Banking: Functions – Credit Control Measures – Qualitative and quantitative credit control measures – Role of RBI in regulating and controlling banks.

<mark>UNIT IV</mark>

Money Market: Features – Deficiencies in the Indian Money Market.

<mark>UNIT V</mark>

Special Banks: State Bank of India — Commercial banks and rural financing – Regional Rural Banks – Place of Co-operative banks in the Indian banking scene. Development Banking – IDBI – ICICI.

TEXT BOOK

1. Natarajan, Parameswaran. (2002), Indian Banking,: Sultan Chand and sons, New Delhi.

REFERENCES

1. Santhanam. (2001) Banking and Financial System Margham Publications, Chennai.

2. Vasant Desai. (1991), Indian Banking Nature Performance and Problem, HimalayaPublishing House,Mumbai.

3. Sundaram K.P.M. and Sundaram E.N. (1996) Modern Banking, Sultan Chand and Sons, New Delhi.

ALLIEDELECTIVE-1 GENERAL CHEMISTRY-I

Course Objectives

This course enables the students to

- To learn about the atomicstructure.
- To understand the quantum numbers and electronic configuration.
- To learn the different types ofbonding.
- The basic principles of basic physical and inorganic chemistry. Itenables the students to gain knowledge of chemistry involved inindustries.
- To learn the electronic and structural properties of an atom.
- Understand the interdisciplinary nature of chemistry and to integrate knowledge of mathematics, physics and other disciplines to a wide variety of chemical problems

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. State the location, relative charge, and atomic mass of the sub-atomic particles.
- 2. Perform quantitative calculations based on the relationship between wavelength, energy, and the speed of light.
- 3. Define wavelength, frequency, and energy of a photon.
- 4. Identify, and rank the different types of light radiation.
- 5. Describe the photoelectric effect and relate the energy and/or intensity of the photons to the work function and kinetic energy of the ejected electrons.
- 6. Understand the relationship between discrete electron energy levels and atomic absorption and emission spectra.

UNIT-I

Atomic Structure: Bohr's theory and its limitations, dual behaviour of matter and radiation, de-Broglie's relation, Heisenberg Uncertainty principle. Hydrogen atom spectra. Need of a new approach to Atomic structure. Time independent Schrodinger equation and meaning of various terms in it. Significance of ψ and ψ 2, Schrödinger equation for hydrogen atom.

UNIT-II

Quantum numbers: Significance of quantum numbers, orbital angular momentum and quantum numbers ml and ms. Shapes of s, p and d atomic orbitals, nodal planes. Discovery of spin, spin quantum number (s) and magnetic spin quantum number (ms). Rules for filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completely filled orbitals, concept of exchange energy. Relative energies of atomic orbitals, Anomalous electronic configurations.

UNIT-III

Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajan"s rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.

UNIT-IV

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.

Concept of resonance and resonating structures in various inorganic and organic compounds.

UNIT-V

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules of 1st and 2nd periods (including idea of s-p mixing) and heteronuclear diatomic molecules such as CO, NO and NO+. Comparison of VB and MOapproaches

TEXT BOOKS

- 1. J. D. Lee, A New Concise Inorganic Chemistry (V Edition), ELBS(2002).
- 2. B.R.Puri and L.R.Sharma, Principles of Inorganic Chemistry, Shobanlal& Company Ltd., Jalandar(2002).
- 3. Puri, Sharma & Pathania, Physical Chemistry, Vishal Publishing Company Ltd., Jalandhar (2003).
- 4. V.Veeraiyan& A.N.S. Vasudevan, Text Book of Allied Chemistry(IIEdition), HighmountPublishing House, Chennai(2005).

- 1. Douglas, D. H. McDaniel and J. J. Alexander, Inorganic Chemistry: Principles of Structure and Reactivity (IV Edition), John Wiley & Sons, Inc.(1994).
- 2. F. A. Cotton, G. Wilkinson and P. L. Gaus, BasicInorganicChemistry (III Edition), Wiley-Interscience(1995).
- 3. J.E. Huheey, E. A. Keiter, R. L. Keiter and O. K. Medhi, Inorganic Chemistry: Principles of Structure and Reactivity, Pearson Education India,(2006).

15FCC301A

INTRODUCTION TO COMPUTERS

Course Objectives

This course enables the students to

- Know the basic concept of computers.
- Understand the concept of Ms-word, Ms-Excel.
- Be able to work inMs-PowerPoint.
- Knowledge about internet and the usage of E-Mailservices.
- Introduce the fundamentals of computing devices and reinforce computer vocabulary
- Provide foundational or "computer literacy" curriculum that prepares students for life-long learning of computer concepts and skills.

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- 2. Understand the difference between an operating system and an application program, and what each is used for in a computer
- 3. Describe some examples of computers and state the effect that the use of computer technology has had on some common products
- 4. Describe the usage of computers and why computers are essential components in business and society.
- 5. Utilize the Internet Web resources and evaluate on-line e-business system.
- 6. Describe various types of networks network standards and communication software.

<mark>UNIT I</mark>

Introduction- Characteristics of computers- development of computers- generations of computersclassification of computers-the computer system- types of Input/ Output and memory devices- computer software-categories of software.

UNIT II

Starting with MS Office Word – Working with Text – working with tables-Checking spelling and grammaradding graphics to document- Mail merge- printing a document – Advanced features of MS Office Word-Keyboard shortcuts.

UNIT III

Starting with MS Office Excel- Working with Excel workbook-working with worksheet-formulas and functions-inserting charts-sorting-importing data-printing in excel- Advanced features of MS Office Excel.

UNIT IV

Starting with MS Office PowerPoint – Working with PowerPoint- Working with different views- Designing Presentations- Slide Show- Printing in PowerPoint.

<mark>UNIT V</mark>_

The Internet-Evolution of Internet-Owner of Internet- Anatomy of Internet – Internet Terminology- Getting Connected to Internet- Web Brower- Electronic Mail- Search engines- Uses of internet to society.

TEXT BOOK

1. Fundamentals of Computers: For Undergraduate Courses in Commerce and Management, ITL Education Solutions.2011. Pearson, New Delhi.

- 1. Pradeep K.Sinha, Priti Sinha. Computer Fundamentals, 2007, 6th Edition BPB Publications, New Delhi.
- 2. V. Rajaraman. Fundamentals of Computers, Prentice-Hall Of India Pvt. Limited, 2003.
- 3. Wallace Wang.Microsoft Office 2007 For Dummies,1stEdition Wiley PublishingInc.

15FCC301B

Course Objectives

This course enables the students to

- This course in curriculum is an introduction to the multimedia and itsapplications.
- This course enables students to understand how the web pages are designed interactively.
- How to critically evaluate website quality, learn how to create and maintain quality web pages learn to create and manipulate images.
- Gain the skills and project-based experience needed for entry into web design and developmentcareers
- Set up a document, Incorporate Color Techniques
- Format the InDesign text to look professional

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- Identify and describe the function of the general skill sets in the multimedia industry.
- Identify the basic components of a multimedia project.
- Identify the basic hardware and software requirements for multimedia development and playback.
- Identify a range of concepts, techniques and tools for creating and editing the interactive multimedia applications.
- Identify the current and future issues related to multimedia technology.
- Both theoretical and practical aspects in designing multimedia systems surrounding the emergence of multimedia technologies using contemporary hardware and software technologies.

UNITI

Multimedia – An overview: Introduction – Multimedia presentation and production – Characteristics of Multimedia presentation – Hardware and Software Requirements – Uses of Multimedia. Text: Types of text - Font - Text File formats. Image: Image data representation – Image file formats – Image processing software. Graphics: Advantages of graphics – Uses – Components of a graphics system.

<mark>UNIT II</mark>

Audio: Sound waves – Types and properties of sound – Components of audio system – Digital audio - Musical Instrument Digital Interface (MIDI) – Audio file formats – Audio processing software. Video: Motion video – Television systems – Video file formats – Video processing software. Animation: Uses of animation – Computer based animation – Animation file formats – Animation software.

UNITIII

Introducing Photoshop elements: About elements – Welcome screen – Create mode – Menu bar – Toolbox – Options bar – Panels. Organizing images: Obtaining images – Tagging images - Searching for images - Opening and saving images. Selecting Areas – Layers – Text and Drawing Tools.

<mark>UNIT IV</mark>

Understanding Flash: Understanding Flash basic elements – Creating a simple animation. Learning Flash Toolbox: Learning the toolbox – Using tools. Learning Flash Panels: Understanding the panels. Using timeline and layers: Understanding how timeline works – Understanding layers. Drawing objects: Drawing lines and fills – Using colors – Rotating, skewing and scaling – Grouping objects.

<mark>UNITV</mark>

Creating animation – How animation works – Creating motion tweens – Creating shape tweens. Understanding masks – Creating masks. Creating symbols and using the library: Learning about symbols – Creating symbols – Using libraries. Learning Basic ActionScript concepts: ActionScript basics – Data type basics.

TEXT BOOKS

- 1. Ranjan Parekh, 2013, Principles of Multimedia, 2nd Edition, Tata McGraw hill . (Unit I, UnitII)
- 2. Nick Vandome, 2011, Photoshop Elements 9, Tata McGraw hill. (Unit III)
- 3. Brian Underdahl, 2002, Macromedia Flash MX A Beginners Guide, Dreamtech Press. (Unit IV, UnitV)

- 1. Tay Vaughan, 2002, Fundamentals of Multimedia, 5th Edition, TataMcGraw-Hill.
- 2. Bill Sanders. 2001. Flash5 Action Script, 1st Edition, Dream Tech Press, NewDelhi

		Semester – III
		L T PC
15SSD301	SOFTSKILLDEVELOPMENT-II	2 0 0 0

Course Objectives

This course enables the students to

- To impact knowledge on both Aptitude and Soft skills to thestudents
- To critically evaluate and demonstrate various principles involved in solving mathematical problems
- Adopt new and faster methods of calculations.
- Reinforcing competencies in soft skills which are crucial in a socialsetting
- Become self-confident individuals by mastering inter-personal, team management, and leadership skills.

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• Take part effectively in various selection procedures adopted by the recruiters

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. Solve the problem of finding time, speed and distance.
- 2. Apply the concept of permutation and combination in appropriate problems
- 3. Acquire the knowledge of data sufficiency.
- 4. Improve the English communication skills.
- 5. Improve the skills of resume writing and attitude.
- 6. Get knowledge of personality development and acquire the knowledge of how to attend the interview.

<mark>UNIT - I</mark>

Time, Speed and Distance, Time and Work, Pipes and Cisterns, Geometry, Data Arrangement

<mark>UNIT – II</mark>

Analogy, Logic based Venn diagram, Probability, Permutation and Combination, Logarithms

<mark>UNIT – III</mark>

Data Sufficiency, Clocks, Calendar, Reading Comprehension, Sentence Correction, Sentence Completion, Spotting the Errors, Jumbled Sentences

<mark>UNIT – IV</mark>

Synonyms, Antonyms, Verbal Analogy, Statements and Assumptions, Group Discussion

<mark>UNIT - V</mark>

Resume Writing, Introduction to HR rounds, Time Management, Attitude and Behaviour

ENGLISH -IV

Course Objectives:

- To train the students in understanding the concepts of communication.
- To be familiar with the four basic skills of English.
- To train students in developing their written communication.
- To train students in developing their presentation skills.
- To acquire the skill of making grammatically correct sentences.
- To reflect originality on the application of soft skill views and express in writing their views.

Course Outcome:

- 1. Students have acquired proficiency in communication.
- 2. Students have become adept in written communication and presentation skills.
- 3. Developed the skill of writing in English and that of public speaking.
- 4. Establish and maintain social relationships.
- 5. Develop communication skills in business environment.
- 6. Enhanced communication competency through LSRW skills

UNIT I – Concept of Communication – Barrier to Communication –Body language – Personality Development – Etiquette and Manners- Soft Skills – Emotional Intelligence

UNIT II – Listening Comprehension – Reading Comprehension – Paragraph writing – Precis Writing – Writing Resume and Covering Letter -Speaking – Welcome Address, Vote of Thanks, Compering, Debates, Role Play, Dialogues – Vocal Communication Techniques. Voice, Quality, Volume, Pitch

UNIT III – Dicto Composition – Letter Writing (Informal, Letters to the Editor etc) – Term paper – Book reviews

UNIT IV – Business Correspondence – Layout of Business Letter – Formal Styles of Business Letters – Letters of Acceptance, Appointment, Resignation, Complaint, Sending E-mails.

UNIT V – Effective Presentation – Planning – Audience Analysis –Logical Sequencing – Timing of the Presentation – Conclusion – Answering Queries – Group Discussion – Interview.

Prescribed Text:

Juneja. P. Om and Aarati Mujumdar, "Business Communication - Techniques and Methods", Orient Blackswan Pvt. Ltd., Hyderabad: 2010.

Reference:

Badi, R.V and K. Aruna. Business Communication, 2008, Vrinda Publications: New Delhi.

Balasubramanian M and G Anbalagan. Performance in English. 2007. Anuradha Publications: Kumbakonam

Mohan, Krishna and Meenakshi Raman.2008, Effective English Communication, Tata McGraw Hill: New Delhi.

Selley, John. Oxford Guide to Effective Writing and Speaking. 2005. OUP: New Delhi.

15MMU401 VECTOR ANALYSIS ANDTRANSFORMS

Course Objectives

This course enables the students to learn

- The concepts of essentials of vector function, Gradient, Divergence Curl of a vector and its geometrical applications.
- The integration of vectors Line Integral, Surface Integral and Volume Integral.
- The Fourier series, Fourier transforms and its applications.
- The Z transform and Inverse Z transform.
- Compute the curl and the divergence of vector fields
- Use the fundamental theorem of line integrals

Course Outcomes (COs)

On successful completion of this course, the students will be able to

1. Understand the concepts of partial derivatives and directional derivatives.

2.Use of line integrals of vector functions and their applications and also understancdGauss divergence theorem, Green's theorem and Stoke's theorem.

3.Understand the various concepts of Fourier series.

- 4. Know about the definition and properties of Fourier transforms
- 5. Solve the finite difference equations using Z transform.
- 6. Study the properties of Z-Transforms.

<mark>UNIT I</mark>

Introduction – Scalars and vectors – Differentiation of vectors – Derivative of a vector function – Some important results – Partial derivatives – Gradient, Divergence and Curl of a vector – Directional derivatives – Level surfaces.

UNITII

Introduction – Integration of vectors – Line integral – Surface integrals. Volume integrals : Gauss divergence theorem – Green"s theorem – Stoke"s theorem.

<mark>UNIT III</mark>

Fourier series – Definition – Finding Fourier coefficients for a given periodic function with period 2π – Odd and Even functions – Half RangeSeries

UNIT IV

Definition of Fourier Transform-Properties of Fourier Transform- Inverse Fourier transform-Convolution theorem-Finite Fourier Sine & Cosine Transform – Parseval"s theorem.

UNITV

Introduction - Properties of Z- Transforms – Z- Transforms of some basic functions. Inverse Z Transforms - Z Transforms in solving finite difference equations.

TEXT BOOKS

1. Kandasamy P., Thilagavathy K., and K.Gunavathy, 2007 .EngineeringMathematics Vol. III, S. Chand & Company Ltd, New Delhi. (ForUnit-I&II)

2. Veerarajan T., 2010. Engineering Mathematics - Semester II , Tata mcgraw Hill Company, New Delhi. (For Unit- III toV)

REFERENCES

1. Sundaram V., Balasubramanian R., and K.A. Lakshminarayanan., 2001. Engineering

Mathematics Vol. III, Vikas publishing house PVT., LTD, NewDelhi.

2. Janardhanan Pillay C.P., 2004. Vector Analysis and Differential Equations, Ajith Book Centre, P.O.Kanniyampuram,Ottapalam.

Course Objectives

This course enables the students to learn

- The mathematical concepts in optimal use of resources like LPP, TP, Assignment problems etc.
- Impart the basic concepts and applications of linear programming.
- The concepts of Queuing theory and its different types.
- Inventory Control and Stochastic Model.
- To introduce students to use quantitive methods and techniques for effective decisions-making.
- To impart the knowledge of formulation of practical problems using the linear programming method and its extensions.

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- 1. Solve the Linear programming problems by using simplex method, Big M method and Duality method.
- 2. Get the Knowledge in Transportation models and Assignment problem.
- 3. Identify the basic analysis of queuing systems.
- 4. Identify the basic analysis of various inventory models.
- 5. Acquire the knowledge of Network representation.
- 6. Understand the role and application of PERT/CPM for project scheduling.

UNIT I

Linear Programming: Formulation of LPP – Graphical solution to LPP –Simplex method – Big M method-Duality in LPP.

UNIT II

Transportation model: Introduction – Mathematical Formulation –Finding initial Basic Feasible solutions – Optimum solution for non-degeneracy and degeneracy model - Unbalanced Transportation problems and Maximization case in Transportation problem.

The Assignment problem - Mathematical formulation of the problem – Hungarian method – Unbalanced Assignment problem- Maximization case in Assignment problem.

UNIT III

Queuing theory: Introduction – Characteristics of queuing system. Poisson process and Exponential Distribution – Classification of Queues. Single server – Infinite Capacity (M/M/1):($\infty/FIFO$), Single server – Finite Capacity (M/M/1):($\infty/FIFO$), Multi server – Infinite Capacity (M/M/C):($\infty/FIFO$) and Multi server – Finite Capacity (M/M/C):($\infty/FIFO$) models

Sequencing: Introduction –Definition. Processing n-jobs through 2 machines, Processing n-jobs through 3 machines.

UNIT IV

Inventory Control: Introduction – Costs involved in inventory – Deterministic EOQ models – Purchasing Model without and with shortage, Manufacturing Model without and with shortage – Stochastic Model - Price

break.

UNIT V

PERT and CPM: Network representation – Calculation of Earliest expected time, latest allowable occurrence time. CPM - various floats for activities – critical path. PERT –Time estimates in PERT- Probability of meeting scheduled date of completion of projects.

TEXT BOOK

1.Kanthi Swarup, Gupta P.K., and Man Mohan., 2003. Operations Research, Sultan Chand & Sons, NewDelhi.

- 1. Anand Sharma, 2004 .Operations Research , Himalaya Publishing House , NewDelhi.
- 2. Kalavathy.S, 2002 .Operations Research, Vikas Publishers House Pvt Ltd., Trichy.
- 3. Sundaresan V., Ganapathy Subramanian K.S., and Ganesan K., 2005.OperationsResearch (Resource Management Techniques), A. R. Publications, Nagapatinam.
- 4. Sharma J.K., 2009.Operations Research: Theory and Applications, Macmillan Publishers India Ltd, NewDelhi.

ANALYTICAL GEOMETRY

Course Objectives

15MMU403

This course enables the students to learn

- Geometry and its applications in the real world
- The basic concepts in Straight line, Sphere, Cone and Cylinder.
- The application of Geometrical figures.
- Geometric ideas in the language of the mathematician.
- Accurately identify the equations, properties and graphs of the parabola, circle and ellipse
- Demonstrate the ability to use trigonometric functions to find the parts of a right triangle and to solve problems involving right triangles

Course Outcomes (COs)

On successful completion of the course, students will be able to:

- 1. Evaluate the angle between the lines, direction cosines
- 2. Describe the basic concepts in planes and to find the shortest distance between two given lines.
- 3. Explain the concepts of sphere and intersection of two spheres.
- 4. Acquire the knowledge on basic concepts Cone and find the equation of a right circular cone with vertex at the origin.
- 5. Understand the definition and concept of Cylinder.
- 6. Evaluate the problems related to cylinder and right circular cylinder.

UNIT I

Rectangular Cartesian co-ordinates – Distance between points – Direction cosines – Direction ratios – Angle between the lines – Conditions for perpendicularity and parallelism.

<mark>UNIT II</mark>

Straight line : Symmetrical form of the equations of a line – The plane and the straight line – Coplanar lines – The shortest distance between two given lines.

<mark>UNIT III</mark>

Sphere: Definition – Equation of the sphere – Length of the tangent – The plane section of a sphere – Equation of a circle on a sphere – Intersection of two spheres.

UNIT IV

Cone : Definition – Quadric cone – Cone whose vertex is at the origin . Right circular cone : Definition –Equationofa right circular cone with vertex at the origin – Enveloping cone.

UNIT V

Cylinder : Definition – Equation of the cylinder – Right circular cylinder.

TEXT BOOK

1. Manicavachagom Pillay T.K., and T.Natarajan., 1996. Analytical Geometry 3D, S.Viswanathan printers & Publishers, Pvt Ltd, Madras.

- 1. Venkataraman. M.K, 2000. Engineering Mathematics, Second Edition, TheNational Publishing Company, Chennai.
- 2. Kandasamy P., Thilagavathy K., and K.Gunavathy ., 2008. Engineering Mathematics, S.Chand Company Ltd, Ram Nagar, NewDelhi.
- 3. Duraipandian.P ,Laxmi Duraipandian and D.Muhilan ., 2000. Analytical Geometry 3D ,Emerald Publishers, Pvt. Ltd,Chennai.

Semester – IV L T PC 4 2 0 4

15MMU404A

ALLIEDELECTIVE-2 COST AND MANAGEMENTACCOUNTING

. Course Objectives

This course enables the students to

- Know the area of cost and management accounting.
- Identify the major differences and similarities between financial and management accounting.
- Understand the role of management accountant in an organization, and the importance of upholding ethical standards
- Expose students to methods and techniques needed by managers for performing functions such as costing, cost allocations, preparation of flexible budgets and variance analysis.
- Enhance the abilities of learners to develop the concept of management accounting and its significance in the business.
- Enable the learners to understand, develop and apply the techniques of management accounting

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. Asses the significance and role of cost accounting
- 2. Import the knowledge on the nature of elements of cost and cost sheet preparation
- 3. Enrich the knowledge on the preparation of various budgets
- 4. Analyze the Financial Statement Analysis
- 5. Prepare budget and budgetary control
- 6. Acquire knowledge of Profit analysis.

UNIT I

Cost Accounting – Definition, meaning and scope – Relationship of Cost accounting with financial accounting and management accounting – Methods of costing – cost analysis – concepts and classifications – Elements of cost – preparation of cost sheet and tender — limitations of cost accounting.

UNIT II

Management Accounting – meaning, nature and Scope and functions of management accounting – relationship between management accounting, and financial accounting-role of management in decision making

UNIT III

Working Capital- concepts, kinds, importance of working capital-working capital requirements and their computation- sources of working capital - forecasting of working capital requirements

<mark>UNIT IV</mark>

Budget, Budgeting and budgetary control – definition, importance, essentials, classification of budgets, master budgets, preparation of different budgets – steps in budgetary control.

UNIT V

Standard costing – Advantages and disadvantages- Difference between budgetary control and standard costing- Variance- Types of variance- material and labor variances only.

TEXT BOOK

1. ShashiK.Gupta and R.K.Sharma 2009, Management Accounting. Kalyani Publishers. Ludhiana.

REFERENCES

- 1. R.S.N.Pillai and Bagavathi. 2005, Cost Accounting. New Delhi: S.Chand&Co.
- 2. S.P.Jain and K.LNarang, 2006, Cost Accounting. Ludhiana : KalyaniPublishers.
- 3. M.C.Shukla and T.S.Grewal, Gupta., 2008, Cost Accounting. New Delhi: Sultan Chand & Sons.
- 4. Man Mohan & Goyal. Management Accounting. Sahitya bhavan. NewDelhi:

5. Srinivasan. N.P. (2006). Management and Financial Accounting. Sterling Publishers Pvt Ltd. New Delhi.

15MMU404B

ALLIEDELECTIVE-2 HUMAN RESOURCE MANAGEMENT

Course Objectives

This course enables the students to

- Know about the HR principles on anorganization
- Impart the knowledge on wage and salary administration
- Understand the other benefits avail by the employees.
- Develop, implement, and evaluate employee orientation, training, and development programs.
- Help the students focus on and analyze the issues and strategies required to select and develop manpower resources
- Develop relevant skills necessary for application in HR related issues

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. Understand the fundamentals of HR and its interface with other functions in the organization
- 2. Understand the behavioral aspects at individual as well as organizational level
- 3. Study the tools & techniques in people management
- 4. Understand the strategic role of HR and global standards
- 5. Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes.
- 6. Administer and contribute to the design and evaluation of the performance management program.

<mark>UNIT I</mark>

Introduction to HRM: Definition, Objectives and Functions of HRM –Role and Structure of Personnel Functions in Organization, Personal Principles and Policies.

<mark>UNIT II</mark>

Human Resource Planning: - Characteristics of HRP, Need for Planning HRP Process job Analysis, Job Description, Job Specification. Selection Process - Placement and Induction, Training and Development, Promotion, Demotions, Transfers, Separation.

<mark>UNIT III</mark>

Wage and Salary Administration: - Factors Principles, Compensation Plan, Individuals, Group Incentives, Bonus, Fringe Benefits, and Job Evaluation Systems.

<mark>UNIT IV</mark>

Employee Maintenance and Integration:- Welfare and Safety, Accident Prevention, Administration of Discipline, Employee Motivation, Need and Measures.

<mark>UNIT V</mark>

Personnel Records and Reports: - Personnel Research and Personnel Audit, Objectives, Scope and Importance.

TEXT BOOK

S.S.Khanka. (2000), Human Resource Management, Sultan Chand & Sons, New Delhi.

REFERENCES

1.CS. Venkataraman and BK.Srivastva:-Personnel Management and HumanResources.

- 2. Yodder, Dale and Paul.DStandohar Personnel Management and Industrial Relations.
- 3. Prasad, Lallan and A.M.Banerjee Management of HR

15MMU404C

ALLIEDELECTIVE-2 GENERALCHEMISTRY-II

Course Objectives

This course enables the students to

- Learn about the fundamentals of Organic Chemistry
- Understand theStereochemistry.
- Learn about saturated and unsaturated hydrocarbons
- Study of Catalytic hydrogenation and Carbons
- Acquire a foundation of chemistry of sufficient breadth and depth to enable them to understand and critically interpret the primary chemical literature.
- Professionalism, including the ability to work in teams and apply basic ethical principles.

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. The electronic structure of atoms and its influence on chemical properties
- 2. The principles influencing reactivity, including acid-base behaviors and reaction networks important in nutrition and metabolism
- 3. The principles influencing reactivity, including acid-base behaviors and reaction networks important in nutrition and metabolism
- 4. Balancing simple chemical reactions and strategies to balance them
- 5. The fundamental properties of atoms, molecules, and the various states of matter
- 6. Simple quantum mechanical treatments of atoms and molecules

<mark>UNIT I</mark>

Electronic effects: Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis. Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles.

<mark>UNIT II</mark>

Reactive Intermediates and Aromaticity: Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Benzenoids and Hückel"s rule.

<mark>UNIT III</mark>

Stereochemistry: Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism and Diastereomerism. Threo and erythro; D and L; cis – trans nomenclature; CIP Rules: R/S (for upto 2 chiral carbon atoms) and E / Z Nomenclature (for upto two C=C systems).

<mark>UNIT IV</mark>

Alkanes and Alkynes:

Alkanes: (Upto 5 Carbons). Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbe''s synthesis, from Grignard reagent. Reactions: Free radical Substitution:Halogenation.

Alkynes: (Upto 5 Carbons) Preparation: Acetylene from CaC_2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides. Reactions: formation of metal acetylides, addition of bromine and alkaline KMnO₄, Ozonolysis and oxidation with hot alk.KMnO₄.

UNIT V

Alkenes: (Upto 5 Carbons) Preparation: Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction).

Reactions: cis-addition (alk. KMnO₄) and trans-addition (bromine), Addition of HX (Markownikoff's and anti-Markownikoff's addition), Hydration, Ozonolysis, oxymecuration- demercuration, Hydroboration-oxidation.

TEXT BOOKS

- 1. Arun Bahl and B. S. Bahl, Advanced Organic Chemistry, S. Chand publisher(2010).
- 2. Jerry March, Advanced Organic Chemistry (IV Edition), John Wiley & Sons (ASIA) Pte. Singapore(1992).
- 3. L. Finar, Organic Chemistry (Vol. I, V Edition), Longman publishing group, E. L. B. S. Edition (1975).
- 4. I. L. Finar, Stereochemistry and the chemistry of the natural products (Vol. II, V Edition), Longman publishing group, E. L. B. S. Edition(1975).
- 5. R. T. Morrison & R. N. Boyd, Organic Chemistry (VI Edition), Prentice Hall(1992).

- 1. N. Tewari, Advanced Organic Reaction Mechanism (III Edition), Books and Allied (P) Ltd, Kolkata(2011).
- 2. P. Ramesh, Basic Principles of Organic Stereochemistry (I Edition), Meenu Publications, Madurai(2005).
- 3. T. W. Graham Solomons and Craig Fryhle, Organic Chemistry (X Edition), John Wiley & Sons(2009).
- 4. Peter Sykes, A Guide Book to Mechanism in Organic Chemistry (VI Edition), Orient Longman (1988).
- 5. E L Eliel, Stereochemistry of Carbon Compounds, Tata McGraw-Hill, New Delhi(1992).

15SSD401

SOFTSKILLDEVELOPMENT-II

Course Objectives

This course enables the students to

- To impact knowledge on both Aptitude and Soft skills to the students
- To critically evaluate and demonstrate various principles involved in solving mathematical problems.
- Adopt new and faster methods of calculations
- Reinforcing competencies in soft skills which are crucial in a social setting
- Work together as a team, for the benefit of their own, and the organization's, success
- Become more effective communicators and leaders

Course Outcomes (COs)

On successful completion of this course, the student will be able to:

- 1. Solve the problem of finding time, speed and distance.
- 2. Apply the concept of permutation and combination in appropriate problems
- 3. Acquire the knowledge of data sufficiency.
- 4. Improve the English communication skills.
- 5. Improve the skills of resume writing and attitude.
- 6. Develop the personality development and acquire the knowledge of how to attend the interview.

<mark>UNIT - I</mark>

Time, Speed and Distance, Time and Work, Pipes and Cisterns, Geometry, Data Arrangement

<mark>UNIT – II</mark>

Analogy, Logic based Venn diagram, Probability, Permutation and Combination, Logarithms

<mark>UNIT – III</mark>

Data Sufficiency, Clocks, Calendar, Reading Comprehension, Sentence Correction, Sentence Completion, Spotting the Errors, Jumbled Sentences

<mark>UNIT – IV</mark>

Synonyms, Antonyms, Verbal Analogy, Statements and Assumptions, Group Discussion

<mark>UNIT - V</mark>

Resume Writing, Introduction to HR rounds, Time Management, Attitude and Behaviour

REAL ANALYSIS-I

Course Objectives

15MMU501

This course enables the students to learn

- The Real and Complex number systems and the field axioms
- About the Upper bounds, lower bounds
- The concept of a set theory, countable and uncountable sets.
- Euclidean Space and its properties.
- The development of the mathematical skills to solve problems involving convolution, filtering, modulation and sampling.
- To appreciate how mathematics is used in design (e.g. conformal mapping);

Course Outcomes (COs)

On successful completion of this course, the student will be able to

- 1. Understand the basic concepts of real and complex numbers.
- 2. Acquire the knowledge in relations and functions of sets.
- 3. Examine the different types of sets and its properties.
- 4. Describe the Weierstrass theorem and Cantor intersection Theorem.
- 5. Express the covering and compactness in metric spaces.
- 6. Evaluate the limit, continuity of complex and vector valued functions.

UNIT I

The Real and Complex number systems the field axioms, the order axioms –integers –the unique Factorization theorem for integers –Rational numbers –Irrational numbers –Upper bounds, maximum Elements, least upper bound –the completeness axiom–some properties of the supremum–properties of the integers deduced from the completeness axiom- The Archimedean property of the real number system.

UNIT II

Basic notions of a set theory: Notations –ordered pairs –Cartesian product of two sets – Relations and functions – further terminology concerning functions –one –one functions and inverse –composite functions –sequences –similar sets-finite and infinite sets –countable and uncountable sets – uncountability of the real number system.

UNIT III

Elements of point set topology: Euclidean space R^n –open balls and open sets in R^n . The structure of open Sets in R^n –closed sets and adherent points –The Bolzano –Weierstrass theorem– the Cantor intersection Theorem.

<mark>UNIT IV</mark>

Covering –Lindelof covering theorem –the Heine Borel covering theorem –Compactness in R^n – Metric Spaces –point set topology in metric spaces –compact subsets of a metric space –Boundary of a set.

UNIT V

Convergent sequences in a metric space –Cauchy sequences –Completeness sequences –complete metric Spaces. Limit of a function –Continuous functions –continuity of composite functions. Continuous complex valued and vector valued functions.

TEXT BOOK

1. Apostol. T.M., 1990. Mathematical Analysis, Second edition, Narosa Publishing Company, Chennai.

- 1. Balli. N.P., 1981. Real Analysis, Laxmi Publication Pvt Ltd, New Delhi.
- 2. Gupta . S.L ., and N.R. Gupta ., 2003.Principles of Real Analysis, Second edition, Pearson EducationPvt.Ltd,Singapore.
- 3. Royden .H.L ., 2002. Real Analysis, Third edition, Prentice hall of India, NewDelhi.
- 4. Rudin. W., 1976 .Principles of mathematical Analysis, Mcgraw hill, Newyork.
- 5. Sterling. K. Berberian, 2004. A First Course in Real Analysis, Springer Pvt Ltd, NewDelhi.

COMPLEX ANALYSIS-I

15MMU502

Course Objectives

This course enables the students to learn

- The concepts of complex numbers and analytic functions.
- The concept of conformal mapping and bilinear transformation.
- The basics of Power Series and its convergence.
- About the Bilinear Transformation and Complex Integration
- Techniques of complex analysis that make practical problems easy (e.g. graphical rotation and scaling as an example of complex multiplication)
- To understand how complex numbers provide a satisfying extension of the real numbers

Course Outcomes (COs)

On successful completion of this course, the student will be able to

- 1. Explain the basic concepts of complex number system and complex plane
- 2. Understand the ideas of analytic function and its properties.
- 3. Describe the convergence of power series and elementary functions
- 4. Evaluate cross ration and construct conformal and bilinear transformation.
- 5. Perform integration on complex valued function.
- 6. Evaluate complex integration over a simple and closed curves.

<mark>UNIT I</mark>

Complex number system:Complex number-Field of a complex numbers-Conjugation –Absolute value of a complex number.Complex plane: Complex number by points-nth root of a complex number-Angle between two rays- Elementary transformation- Stereographic projection.

<mark>UNIT II</mark>

Analytic functions: Limit of a function –continuity –differentiability – Analytical function defined in a region –necessary conditions for differentiability –sufficient conditions for differentiability – Cauchy-Riemann equation in polar coordinates –Definition of entire function.

<mark>UNIT III</mark>

Power Series: Absolute convergence –circle of convergence –Analyticity of the sum of a power series-Uniqueness of representation of a function by a power series- Elementary functions : Exponential, Logarithmic, Trigonometric and Hyperbolic functions. Harmonic functions: Definition and determination.

<mark>UNIT IV</mark>

Bilinear transformation-Circles and Inverse points-Transformation mappings w=Z², w=Z^{1/2}, w=e^Z, w = sin Z,and w=cos Z -Conformal mapping-isogonal mapping.

<mark>UNIT V</mark>

Complex integration: Simple rectifiable oriented curves –Integration of complex functions- Definite integral-Interior and Exterior of a closed curve-Simply connected region-Cauchy's fundamental theorem-Cauchy's formula for higher derivatives- Morera's theorem.

TEXT BOOK

1.Duraipandian.P., Lakshmi Duraipandian.,1997.Complex analysis,Emerald publishers, Chennai-2

- 1. Lars V.Ahlfors.,1979. Complex Analysis, Third edition, Mc-Graw Hill Book Company,New Delhi
- 2. Arumugam.S., Thangapandi Isaac., and A.Somasundaram., 2002. Complex Analysis, SCITECH Publications Pvt.Ltd, Chennai.
- 3. Choudhary.B., 2003. The Elements of Complex Analysis ,New Age International Pvt.Ltd ,NewDelhi.
- 4. Ponnusamy.S., 2004. Foundations of Complex Analysis, Narosa Publishing House, Chennai.
- 5. Vasishtha A.R., 2005. Complex Analysis, Krishna Prakashan Media Pvt. Ltd., Meerut.
- 6. Narayanan .S., T.K Manichavachagam Pillay, 1992. Complex Analysis.S.Viswanathan (printers & publishers) pvt Ltd, Madras.

Semester – V L T PC 15MMU503 NUMERICAL METHODS 4 1 0 4 Course Objectives 10 4

This course enables the students to learn

- The basic concepts to solve the algebraic and transcendental equations.
- Utilize computers to solve engineering problems which are impossible to solve by analytical means.
- To solve the simultaneous linear algebraic equations.
- To find the numerical solution for differential and integral equation.
- To prove results for various numerical root finding methods.
- To derive appropriate numerical methods to solve interpolation based problems.

Course Outcomes (COs)

On successful completion of the course, students will be able to:

- 1. Solve the algebraic and transcendental equations.
- 2. Evaluate the solution of simultaneous linear algebraic equations.
- 3. Relate the forward and backward differences and its operators.
- 4. Apply the Newton forward, backward and divided differences to find interpolation of equal and unequal intervals.
- 5. Express numerical integration and differentiation in applied areas.
- 6. Evaluate the numerical solution of ordinary differential equations.

UNIT I

Solution of algebraic and transcendental equations: Bisection method – Iterative method Regula Falsi method – Newton Raphson method – Horners method – Graeffe^{*}s root squaringmethod.

UNIT II

Solution of simultaneous linear algebraic equations: Gauss elimination method – Gauss Jordan method – Method of triangularization – Crout"s method – Gauss-Jacobi method – Gauss-seidel method.

<mark>UNIT III</mark>

Finite Difference: First and higher order differences – Forward and Backward differences – Properties of operator – Difference of a polynomial – Factorial polynomial – Error Propagation in difference table – operator E - Relation between Δ , E and D.

UNIT IV

Interpolation: Gregory Newton Forward and Newton Backward interpolation formula – Equidistant terms with one or more missing values – Interpolation with unequal intervals – Divided differences – Newton's divided difference formula – Lagrange's interpolation formula – Inverse interpolation formula.

UNITV

Numerical Differentiation and Integration: Newton's Forward and backward differences to compute derivatives – Trapezoidal rule, Simpson's 1/3 &3/8 rule. Solution of ordinary differential equations: R-K method (II order , III order and IV order).

TEXT BOOK

1. Venkataraman .M.K., Fifth Edition, 2001. Numerical Methods in Science and Engineering, National publishing Company ,Madras.

- 1. Jain. M.K., Iyengar S.R.K.,andR.K.Jain., 2004. Numerical Methods for Scientific and Engineering Computation, New Age International Publishers, New Delhi.
- 2. Vedamurthy V.N., N.Ch.S.N.Iyenger., 1999. Numerical Methods, Vikas Publishing House Pvt Ltd, NewDelhi.
- 3. Kandaswamy. P., Thilagavathy K., and K.Gunavathy., 2013 .Numerical Methods, S. Chand & Company Ltd., NewDelhi.

Semester – V L T P C 0 0 5 3

15MMU511

NUMERICAL METHODS-PRACTICAL

Course Objectives

This course enables the students to learn

- Exercise user defined functions to solve real time problems.
- Illustrate flowchart and algorithm to the given problem.
- The basic structure of the programme, declaration and usage of variables.
- The basic MATLAB (matrix laboratory) programme.
- To develop an understanding of the elements of error analysis for numerical methods and certain proofs.
- To provide students with an introduction to the field of numerical \methods.

Course outcomes (COs)

On successful completion of this course, the student will be able to

- 1. Evaluate the roots of any algebraic equations.
- 2. Develop a program to solve linear algebraic equations in Gauss Jordan and elimination method.
- 3. Test the default programs for interpolation in Newton's forward and backward.
- 4. Predict the values using interpolation method.
- 5. Calculate the numerical solution of ordinary differential equations
- 6. Evaluate the integral and derivative by using numerical integration rules.

1. Roots of a given Algebraic Equation using Bisectionmethod.

- 2. Roots of a given Algebraic Equation using Newton Raphsonmethod.
- 3. Solution of linear algebraic equations using Gauss Eliminationmethod.
- 4. Solution of linear algebraic equations using Gauss Jordanmethod.
- 5. Solution of linear algebraic equations using Gauss Seidalmethod.
- 6. Interpolation using Newton"s forward.
- 7. Interpolation using Newton's backward.
- 8. Interpolation using Lagrange"smethod.
- 9. Derivative using Newton"s forward differenceformula.
- 10. Derivative using Newton's backward differenceformula.
- 11. The value of the given integral using Simpson"s one thirdrule.
- 12. The value of the given integral using Trapezoidalrule.

15MMU504

MATLAB PROGRAMMING

Course Objectives

This course enables the students to learn

- Exercise user defined functions to solve real time problems.
- Illustrate flowchart and algorithm to the given problem.
- The basic structure of the programme, declaration and usage of variables.
- The basic MATLAB (matrix laboratory) programme.
- To understanding the MATLAB environment
- carry out simple numerical computations and analyses using MATLAB

Course outcomes (COs)

On successful completion of this course, the student will be able to

- 1. Explore the Basics of MATLAB and evaluate basic computation using input and output commands.
- 2. Built the inline and outline functions and solve matrix and array operations.
- 3. Express the script and function files.
- 4. Evaluate Eigen values and Eigen vectors using MATLAB.
- 5. Solve a linear system of equations using MATLAB.
- 6. Apply the MATLAB programme for solving Differential and Integral problems and find the Numerical solution.

<mark>UNIT I</mark>

Introduction - Basics of MATLAB, Input – Output, File types – Platform dependence – General commands.

<mark>UNIT II</mark>

Interactive Computation: Matrices and Vectors – Matrix and Array operations – Creating and Using Inline functions – Using Built-in Functions and On-line Help – Saving and loading data – Plotting simple graphs.

<mark>UNIT III</mark>

Programming in MATLAB: Scripts and Functions – Script files – Functions files-Language specific features – Advanced Data objects.

<mark>UNIT IV</mark>

Applications – Linear Algebra - Solving a linear system – Finding Eigen values and Eigen vectors – Matrix Factorizations.

<mark>UNIT V</mark>

Applications – Data Analysis and Statistics – Numerical Integration – ordinary differential equations – Nonlinear Algebraic Equations.

TEXT BOOK

1. Rudra Pratap, 2003. Getting Started with MATLAB-A Quick Introduction for Scientists and Engineers, Oxford University Press.

- 1. William John Palm, 2005. Introduction to Matlab 7 for Engineers, McGraw-Hill Professional.NewDelhi.
- 2. Dolores M. Etter, David C. Kuncicky, 2004.Introduction to MATLAB 7, Prentice Hall, New Delhi.
- 3. Kiranisingh.Y,Chaudhuri.B.B, 2007.Matlab Programming, Prentice-Hall Of India Pvt.Ltd, New Delhi.

15MMU505A

ELECTIVE-I DISCRETE MATHEMATICS

Course Objectives

This course enables the students to learn

- The concept of algebraic structures and Mathematical Logics.
- lattices and its special categories which plays an important role in the field of computers.
- About the concepts of Relations and Functions.
- The fundamental concepts in graph theory, with a sense of some its modern applications.
- To solve problems using counting techniques and combinatorics.
- To apply algorithms and use definitions to solve problems to proof statements in elementary number theory

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Explore the mathematical logics in Tautology and theory of inference for predicate calculus.
- 2. Understand the basic concepts of relations and functions and composition of functions.
- 3. Describe the Phrase, structure grammar and context free grammar in Formal Languages and Automata
- 4. Express the partial ordering, Lattices and Boolean Algebra and Boolean functions in mathematical logics.
- 5. Describe paths, reachability, connectedness and matrix representation of directed and undirected graphs.
- 6. Apply the concepts of graph theory in real time problems.

UNIT-I

Mathematical logic: Connections well formed formulas, Tautology, Equivalence of formulas, Tautological implications, Duality law, Normal forms, Predicates, Variables, Quantifiers, Free and bound Variables. Theory of inference for predicate calculus.

UNIT-II

Relations and functions: Composition of relations, Composition of functions, Inverse functions, one- to- one, onto, one-to-one & onto, onto functions, Hashing functions, Permutation function.

UNIT-III

Formal languages and Automata: Grammars: Phrase–structure grammar, context-sensitive grammar, contextfree grammar, regular grammar. Finite state automata- Deterministic finite automata and Non deterministic finite automata-conversion of nondeterministic finite automata to deterministic finiteautomata.

UNIT-IV

Lattices and Boolean algebra: Partial ordering, Poset, Lattices, Boolean algebra, Boolean functions, Theorems, Minimization of Boolean functions.
UNIT-V

Graph Theory: Directed and undirected graphs, Paths, Reachability, Connectedness, Matric representation, Eular paths, Hamiltonean paths, Trees, Binary trees simple theorems, and applications.

TEXT BOOK

1.Tremblay J.P., and R.P Manohar., 1975 . Discrete Mathematical Structures with applications to computer science, Tata Mc.Graw Hill, New Delhi .

REFERENCES

1. Sundaresan V., Ganapathy Subramanian K.S., and Ganesan K., 2002. Discrete Mathematics, A.R. Publications, Nagapatinam.

2. Veerarajan T.,2007. Discrete Mathematics with graph theory and combinatorics, Tata Mc-graw hill companies, New Delhi.

3. Sharma. J.K, 2005. Discrete Mathematics, Second Edition, Macmillan India Ltd, New Delhi.

15MMU505B

ELECTIVE-I NUMBER THEORY AND CRYPTOGRAPHY

Course Objectives

This course enables the students to learn

- Mathematical concepts and principles to perform numerical and symbolic computations.
- To investigate and solve mathematical and statistical problems.
- To write clear and precise proofs.
- To communicate effectively in both written and oral form.
- To analyse hypotheses and conclusions of mathematical statements
- To understand the basics of modular arithmetic.

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Describe the divisibility theory, fundamental theorem of Arithmetic and theory of congruence.
- 2. Use Fermat's, little and Wilson theorems on congruence and number theoretic problems.
- 3. Establish the generalization of Fermat and Euler theorems also properties of phi function
- 4. Estimate the Primitive roots, indices and composite numbers.
- 5. Describe the basic concepts in Cryptography
- 6. Identify number theoretic concepts which are related to and used in cryptography

UNIT -I

Divisibility theory in integers, g.c.d, prime, fundamental theorem of Arithmetic, the theory of congruence.

<mark>UNIT -II</mark>

Fermat^{*}s theorem – Pierre de Fermat – Fermat^{*}s factorization method – the little theorem – Wilson theorem .

<mark>UNIT -III</mark>

Euler^{**}sgeneralizationofFermat^{**}stheorem–Euler^{**}sphifunction–Euler^{**}stheorem– some properties of phifunction.

<mark>UNIT -IV</mark>

Primitive roots and indices – the order of an integer – modulo n – primitive for primes composite numbers having primitive roots – the theory of indices. The Fermat conjecture – phythagorean Triples – The famous Last theorem.

<mark>UNIT -V</mark>

Cryptography – classical cryptography – some simple crypto system-Shannon"s theory

TEXT BOOK

1. Neal Koblitz., 2006. A course in Number theory and Cryptography, 2nd Edition, Hindustan Book Agency, New Delhi.

- 1. Stallings. W, 2000. Cryptography and Network Security, Prentice Hall India, NewDelhi.
- 2. Douglas Stinson, 2007.Cryptography theory and practise,Secondedition,Chapman& Hall/CRC, NewDelhi.
- 3. David M Burton, 2006.Elementary number theory, 6th Edition, New age international Private limited, NewDelhi.

15MMU505C

ELECTIVE-I STOCHASTIC PROCESSES

Course Objectives

This course enables the students to learn

- The mathematical theory of random variables and random processes
- To apply Stochastic Process in day to day life probles.
- How queueing theory are used as tools and mathematical models in the study of networks.
- The theoretical concepts and techniques for solving problems that arises in practice
- Expose the students to the basics of probability theory and random processes
- Understand the definition of a stochastic process and in particular a Markov processes

Course Outcomes (COs)

On successful completion of the course, students will be able to:

- 1. Describe the concepts and definitions of stochastic Processes, Markov chains.
- 2. Understand the ideas about Markov Process and Poisson Process in discrete state space
- 3. Explain the Markov process with continuous state space also analyze Brownian motion, Kolmogrov equations.
- 4. Discuss the Branching processes, properties of generating functions Branching process and Time Markov Branching Process.
- 5. Develop the concepts of stochastic processes in queueing systems.
- 6. Execute the stochastic processes models for real world problems.

<mark>UNIT I</mark>

Definition of Stochastic Processes – Markov chains: definition, order of a Markov Chain – Higher transition probabilities – classification of states and chains.

<mark>UNIT II</mark>

Markov Process with discrete state space: Poisson process – and related distributions – properties of Poisson process, Generalizations of Poisson Processes – Birth and death Processes – continuous time Markov Chains.

UNITIII

Markov processes with continuous state space: Introduction, Brownian motion – Weiner Process and differential equations for Weiner process, Kolmogrov equations – first passage time distribution for Weiner process – Ornstein – Uhlenbech process.

<mark>UNITIV</mark>

Branching Processes: Introduction – properties of generating functions of Branching process– Distribution of the total number of progeny, Continuous- Time Markov Branching Process, Age dependent branching process: Bellman-Harris process.

<mark>UNITV</mark>

Stochastic Processes in Queuing Systems: Concepts – Queuing model M/M1 – transient behavior of M/M/1 model – Birth and death process in Queuing theory: M/M/1 – Model related distributions – M/M/1 - M/M/S/S – loss system - M/M/S/M – Non birth and death Queuing process: Bulk queues – M(x)/M/1.

TEXT BOOK

1.Medhi. J, 2006.Stochastic Processes, 2nd Edition, New age international Private limited, New Delhi.

- 1. K. Basu, 2003. Introduction to Stochastic Process, Narosa Publishing House, NewDelhi.
- 2. Goswami and B. V. Rao,2006. A Course in Applied Stochastic Processes, HindustanBook Agency, NewDelhi.
- 3. G. Grimmett and D. Stirzaker,2001.Probability and Random Processes, 3rd Ed., Oxford University Press, NewYork.
- 4. Papoulis.A and Unnikrishna Pillai, 2002. Probability, Random variables and Stochastic Processes, Fourth Edition, McGraw-Hill, NewDelhi.

Semester – V L T PC 0 00 4

15MMU506 ADDITIONAL PAPER-VEDIC MATHEMATICS 0 00

Course Objectives

This course enables the students to

- Eradicates the fear of Mathematics and instills confidence.
- Improves calculation speed and numerical skills
- Get basic knowledge in solving numerical problems using different methods.
- Facilitates a habit of analytical thinking and measured approach towards any problem
- Make mathematics easy and interesting
- Carry out tedious and cumbersome mathematical operations in a simple way

Course Outcomes (COs)

On successful completion of the course, students will be able to

- 1. Solve the simple and compound Multiplication arithmetic problems.
- 2. Understand the concept of different types of division.
- 3. Factorize the fraction of different kinds
- 4. Evaluate the solution for linear and quadratic equations.
- 5. Solve the differentiation problems.
- 6. Explore the concepts of Integration in the way of vedic sutras.

UNIT I

Actual Applications of the Vedic sutras- Arithmetical Computations – Multiplication – Practical Application in Compound Multiplication.

UNIT II

Division by the Nikhilam method – Division by the Paravartya method – Argumental Division – Linking note -Recapitulation and conclusion.

UNIT III

Factorization of Simple Quadratics- Factorization of Harder Quadratics. .

UNIT IV

Simultaneous Simple Equations - Miscellaneous (simple) Equations - Quadratic Equations.

UNIT V

Factorization and Differential Calculus – Partial Fractions – Integration by Partial fractions.

TEXT BOOK:

1.Jagadguru Swami Sri Bharati KrisnaTirthaji Maharaja,2004. Vedic Mathematics, Motilal Bansaridass Publishers Pvt Limited, New Delhi.

15OEU501 STATISTICAL QUALITY CONTROL

Semester – V L T PC 0 0 0 3

Course Objectives

This course enables the students to learn

- The concepts and principles of quality planning and quality conformance.
- To investigate control charts and allied techniques.
- To demonstrate the basic concepts of attributes and variables inspection.
- The basic concepts of Acceptance Sampling.
- To introduce students to statistical quality control (SQC) emphasizing those aspects which are relevant for SQC's practical implementation.
- To understand the purpose and function of statistical quality control.

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Inspect the Quality conformance, quality adherence, quality assurance and management functions.
- 2. Identify total quality control in an industry.
- 3. Identify and apply various properties of control charts
- 4. Describe different types of control charts.
- 5. Explain the concept of sampling, attributes and variables inspection.
- 6. Discuss the different types of sampling plans and organize of quality control.

UNIT I

Total quality control in an industry. Quality planning, quality conformance, quality adherence. Quality assurance and quality managementfunctions.

<mark>UNIT II</mark>

Control charts and allied techniques. Concept of quality and meaning of control. Concept of inevitability of variation-chance and assign-able causes. Pattern of variation. Principles of rational sub-grouping.

<mark>UNIT III</mark>

Different types of control charts. Concept of process capability and its comparison with design specifications, CUSUM charts.

<mark>UNIT IV</mark>

Acceptance sampling. Sampling inspection versus 100 percent inspection. Basic concepts of attributes and variables inspection.

<mark>UNIT V</mark>

OC curve, Single, double, multiple and sequential sampling plans, Management and organization of qualitycontrol.

TEXTBOOK

1. D.C. Montgomery, 1985. Introduction to Statistical Quality Control, Wiley, New Delhi.

- 1. Kandaswamy. P.K.Thilagavathy., and K.Gunavathy., 2004 . Probability statistics and Queueing theory, S. Chand & Company Ltd., NewDelhi.
- 2. Nabendu Pal and Sahadepsarkar., 2008.Statistics concepts and applications, Prentice Hall of India, NewDelhi.
- 3. Grant. E.L. and R. Levenworth, 1988. Statistical Quality Control, 6th ed., McGraw-Hill, New Delhi.
- 4. Juran ,J.M. and F.M. Grayna,1970. Quality Planning and Analysis, Tata McGraw-Hill, New Delhi.
- 5. Ryan T.P, 2000. Statistical Methods for Quality Improvement, Wiley, NewYork.
- 6. Ravichandran J., 2012. Probability and statistics for Engineers., First Edition, WileyIndia.

REAL ANALYSIS-II

15MMU601

Course Objectives This course enables the students to learn

- About the continuous function, uniform continuity and connectedness
- The fundamental properties of the Real numbers.
- Theconcept of Riemann integrals.
- Concepts of Monotonic functions and its properties.
- About Riemann-Stieltjes integrals, sequences and series of functions
- Functions of bounded variation, grasp basic concepts about the total variation.

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Understand about the categories of open sets and closed sets.
- 2. Explain the components of a metric space and connectedness of sets.
- 3. Evaluate the derivatives and infinite derivatives of the given functions.
- 4. Explore the properties of monotonic functions, total and bounded variation of functions
- 5. Evaluate the Riemann Stieltjes integral and change of variables
- 6. Demonstrate an understanding of the theory of functions, continuity, differentiation and integration.

UNIT I

Examples of continuous functions –continuity and inverse images of open or closed sets –functions continuous on compact sets –Topological mappings –Bolzano''s theorem.

UNIT II

Connectedness –components of a metric space – Uniform continuity : Uniform continuity and compact sets – fixed point theorem for contractions –monotonic functions.

UNIT III

Definition of derivative –Derivative and continuity –Algebra of derivatives – the chain rule –one sided derivatives and infinite derivatives –functions with non-zero derivatives –zero derivatives and local extrema – Roll's theorem –The mean value theorem for derivatives.

UNIT IV

Properties of monotonic functions –functions of bounded variation –total Variation –additive properties of total variation on (a, x) as a function of x – functions of bounded variation expressed as the difference of increasing functions.

<mark>UNIT V</mark>

The Riemann - Stieltjes integral : Introduction –Notation –The definition of Riemann –Stieltjes integral – linear properties –Integration by parts –change of variable in a Riemann –stieltjes integral – Reduction to a Riemann integral.

TEXT BOOK

1.Apostol.T.M.,1990. Mathematical Analysis, Second edition, Narosa Publishing Company, Chennai. **REFERENCES**

- 1. Balli. N.P, 1981. Real Analysis, Laxmi Publication Pvt Ltd, New Delhi.
- 2. Gupta . S.L , and N.R. Gupta ., 2003.Principles of Real Analysis, Second edition, Pearson EducationPvt.Ltd,Singapore.
- 3. Royden .H.L , 2002. Real Analysis, Third edition, Prentice hall of India, NewDelhi.
- 4. Rudin. W,1976 .Principles of Mathematical Analysis, Mcgraw hill, Newyork.
- 5. Sterling. K. Berberian, 2004. A First Course in Real Analysis, Springer Pvt Ltd, NewDelhi.

L T PC **COMPLEX ANALYSIS-II** 15MMU602 5 0 0 5

Course Objectives

This course enables the students to learn

- The concepts of analytic function of complex number system, complex function and complex integration •
- The concept of Singularities, real definite integrals and Meromorphic functions. •
- Identify and construct complex-differentiable functions.
- Express functions as infinite series or products. •
- To identify and construct complex-differentiable functions •
- To express functions as infinite series or product

Course Outcomes (COs)

On successful completion of this course, the student will be able to

- 1. Explain the fundamental concepts of complex analysis and mean value theorem and their role in modern mathematics and applied contexts.
- 2. Express the concepts of Taylor's and Laurent's series.
- 3. Evaluate the types of singularities of complex functions and its properties.
- 4. Understand the concepts of real definite Integrals.
- 5. Evaluate the poles and using integration of rational functions.
- 6. Describe the meromorphic function, Principles of argument and Rouche's theorem.

UNIT I

Zero"s of a function-Cauchy"s inequality-Liouville"s theorem-Fundamental theorem of Algebra-Maximum modulus theorem- Gauss mean value theorem- Mean value of the value of a harmonic function on a circle- Term by term differentiation and integration of uniformly convergent series.

UNIT II

Taylor's series and Laurent's series : Taylor's series-Theorems and some related problems- Zero's of an analytic function- Laurent's series – Theorems and some related problems- Cauchy product and division.

UNIT III

Singularities - Isolated Singularities- Removable Singularity- Pole-Essential Singularity-Behaviour of a function at an isolated Singularity-Determination of the nature of Singularity-Problems- Residues- Residues theorem(statement only)- Problems.

UNIT IV

Real definite integrals: Evaluation using the calculus of residues – Integration on the unit circle – Integral with $-\infty$ and $+\infty$ as lower and upper limits with the following integrals:

i) P(x)/Q(x) where the degree of Q(x) exceeds that of P(x) at least2.

ii) (sin ax).f(x), (cos ax).f(x), where a>0 and f(z) $\rightarrow 0$ as $z \rightarrow \infty$ and f(z) does not have apole on the realaxis.

iii) f(x) where f(z) has a finite number of poles on the realaxis.

Semester - VI

UNIT V

Meromorphic functions: Theorem on number of zeros minus number of poles –Principle of argument: Rouche's theorem – Theorem that a function which is meromorphic in the extended plane is a rational function.

TEXT BOOK

1. Duraipandian.P., Lakshmi Duraipandian.,1997.Complex Analysis, Emerald publishers, Chennai-2

- 1. Lars V.Ahlfors.,1979. Complex Analysis, Third edition, Mc-Graw Hill Book Company, New Delhi.
- 2. Arumugam.S., Thangapandi Isaac., and A.Somasundaram., 2002. Complex Analysis, SCITECH Publications Pvt.Ltd, Chennai.
- 3. Choudhary.B., 2003. The Elements of Complex Analysis , New Age International Pvt.Ltd , NewDelhi.
- 4. Vasishtha A.R., 2005. Complex Analysis, Krishna Prakashan Media Pvt. Ltd., Meerut.
- 5. Narayanan .S., T.K Manichavachagam Pillay, 1992. Complex Analysis.S.Viswanathan (printers & publishers) pvt Ltd, Madras.

MODERN ALGEBRA

Course Objectives

This course enables the students to learn

- Group homomorphism, isomorphism, automorphism and its related properties.
- Effectively write abstract mathematical proofs in a clear and logical manner.
- Locate and use theorems to solve problems in number theory and theory of polynomials over a field
- Identifying unsolved yet relevant problem in a specific field.
- To compute determinants and know their properties.
- To present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers

Course Outcomes (COs)

On successful completion of the course, students will be able to:

- 1. Expertise on Sets, mappings and binary operations and relations.
- 2. Understand the concept of Subgroups and its properties.
- 3. Describe the concepts of Homomorphism of groups.
- 4. Understand the basic concepts of Rings and its properties.
- 5. Apply the concept of a field extension to various mathematical problems
- 6. Evaluate ideals and subrings in Rings and quotient rings.

UNIT I

Sets – Mappings – Binary operations and Relations. Groups – Abelian group, SymmetricGroup – Definitions and Examples – Basic properties.

UNIT II

Subgroups – Cyclic subgroup – Index of a group – Order of an element – Fermat theorem –A Counting Principle - Normal Subgroups and Quotient Groups.

UNIT III

Homomorphisms – Cauchy"s theorem for Abelian groups – Sylow"s theorem for Abeliangroups Automorphisms – Inner automorphism - Cayley"s theorem, permutation groups.

UNIT IV

Rings: Definition and Examples –Some Special Classes of Rings – Commutative ring – Field – Integral domain - Homomorphisms of Rings.

<mark>UNIT V</mark>

Ideals and Quotient Rings – More Ideals and Quotient Rings – Maximal ideal - The field of Quotients of an Integral Domain – Euclidean rings.

TEXT BOOK

1. Vasishtha.A.R., 2005. Modern Algebra, Krishna Prakasam Mandir, Meerut.

- 1. Herstein. I.N. 2010. Topics in Algebra, John Wiley & Sons, NewYork.
- 2.Artin.M., 2008. Algebra, Pearson Prentice-Hall of India, NewDelhi.
- 3.Fraleigh.J.B., 2004. A First Course in Abstract Algebra , Seventh edition , Pearson Education Ltd,Singapore.
- 4. Kenneth Hoffman., Ray Kunze., 2003. Linear Algebra, Second edition, Pearson Prentice Hall of India Pvt Ltd, NewDelhi.

15MMU604A

ELECTIVE-II ADVANCED GRAPHTHEORY

Course Objectives

This course enables the students to learn

- The fundamental concepts in Graph Theory and some of its modern applications.
- To apply graph theory based tools in solving practical problems
- Hands-on implementation of algorithms to evaluate the reliability of given networks by applications of programming techniques.
- The use of these methods in subsequent courses in the design and analysis of algorithms, computability theory, software engineering, and computer systems.
- To apply graph-theoretic terminology and notation
- To understand and prove theorems/lemmas and relevant results in graph theory.

Course Outcomes (COs)

On successful completion of the course, students will be able to:

- 1. Understand the concept of undirected graphs, complete graphs, bipartite, weighted graph, shortest path.
- 2. Evaluate the Eulerian path and Hamiltonian cycles in any graphs.
- 3. Describe the concept of trees and a minimal spanning tree for a given weighted graph.
- 4. Apply the knowledge of planar graphs to solve the real-life problem.
- 5. Apply the principles colouring concepts of graph theory in practical situations
- 6. Express the graphs in the way of adjacency, incident and circuit matrices.

<mark>UNIT I</mark>

Undirected graph- Basic concepts- incidence and Degree of vertices- isolated vertex – pendant vertex – Path and Circuits: Isomorphism – Sub graphs – Walks, Paths and Circuits – Connected graphs and concepts – Euler graphs – Hamilton graph – Complete graph – Traveling Salesman problem.

<mark>UNITII</mark>

Trees – Definition – some properties of trees – Theorems – Rooted and Binary trees – Spanning trees. Cut set and cut vertices – some properties of a cut set – sets in a graph – Theorems – Fundamental circuits and cut sets – Connectivity and Separability – Theorems.

<mark>UNIT III</mark>

Planar graphs – Kuratowski''s two graphs – Theorems – Different representation of a planar graph – Detection of planarity – Thickness and crossings.

<mark>UNIT IV</mark>

Colourings – Covering partitioning – Chromatic number Theorems –Chromatic partitioning – Independent set – Finding a maximal independent set – Dominating set – Finding minimal dominating set – Chromatic polynomial – Theorems. Coverings – Theorems – Four colour problem - Five colour Theorem.

Bachelor of Science, Mathematics, 2015, Karpagam Academy of Higher Education, Coimbatore – 21, India.

<mark>UNIT V</mark>

Directed graph – Definition – Some types of di-graphs – Directed path and connectedness – Euler di- graphs – Theorems – Trees with direct edges - Theorems – odded trees – Matrix representation – incidence matrix – Theorems – Circuit matrix – Adjacency matrix – Tournaments.

TEXT BOOK

1.Narsingh Deo., 2007. Graph Theory with Applications to Engineering and Computer Science, Prentice Hall of India Pvt. Ltd, New Delhi.

- 1. Harary F., 1969. Graph Theory, Addision-Wesley publishing company, Inc., Amsterdam.
- 2. Bondy.J.A., and U.S.R.Murty., 2008. Graph theory and applications, Springer.
- 3. Balakrishnan, 2011, Graph theory, Springerpublications.
- 4. West D.B., 2011. Introduction to Graph Theory, Prentice Hall, NewDelhi.

Semester – VI L T PC 5 0 0 5

15MMU604B

ELECTIVE-II FUZZY SETS AND ITS APPLICATIONS

Course Objectives:

The student should be made to:

- Understand the basic knowledge of fuzzy sets and fuzzy logic.
- To gain knowledge in fuzzy relations and fuzzy measures.
- Be exposed to basic fuzzy system applications.
- Explain the concepts of neural networks, fuzzy sets, and genetic algorithms.
- To develop the skills to gain a basic understanding of fuzzy set theory and fuzzy logic theory.
- To understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems.

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Distinguish the crisp sets and fuzzy sets and understand the fuzzy logic .
- 2. Describe the concepts of fuzzy union fuzzy intersection combinations operations
- 3. Develop the fuzzy set theory into fuzzy relations and fuzzy graphs
- 4. Apply basic fuzzy measures and approximate reasoning.
- 5. Understand the concepts of Fuzzy decision making
- 6. Illustrate the fuzzy concepts in real time problems.

<mark>UNITI</mark>

Crisp sets and fuzzy sets - basic concept of fuzzy set - fuzzy logic - operations on fuzzy sets - general discussion fuzzy complements.

UNITII

Fuzzy union - fuzzy intersection - combinations operations.

UNITIII

Fuzzy relations and fuzzy graphs - fuzzy relation on sets and fuzzy sets - composition of fuzzy relations - properties of the min-max composition - fuzzy graphs - special fuzzy relations.

UNITIV

Fuzzy measures - general discussion - belief and plausibility measures - probability measures - possibility and necessity measures.

UNITV

Fuzzy decision making - individual decision making - fuzzy ranking methods - fuzzy linear programming.

TEXTBOOK

1. George J. Klir and Bo Yuan, 1995. Fuzzy sets and fuzzy logic theory and applications, Prentice- Hall of India private limited, New Delhi.

- 1. Timothy J.Ross,2000. Fuzzy logic with Engineering Applications, McGrawHill, Inc. New Delhi.
- 2. George J.Klir, Tina.A Folger, 2008. Fuzzy sets, uncertainty and information, Prentice Hallof India Pvt Ltd, NewDelhi.
- 3. H.J. Zimmermann, 2006. Fuzzy set theory and its applications, Second Edition, Springer New Delhi.

Semester – VI L T PC 5 0 0 5

15MMU604C

ELECTIVE-II LATTICE THEORY

Course Objectives:

The student should be made to:

- Understand the basic knowledge of Sets and subsets.
- Understand Lattices as algebraic Structures.
- To gain knowledge in diagrammatical representation of a poset.
- Be exposed to ideal lattice applications.

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Define Sets, subsets, mappings and binary compositions also discuss the mathematical induction.
- 2. Develop ability to create Diagrammatical Representation of a Poset, lattices and sub lattices.
- 3. Understand the concepts of Homomorphism and Isomorphism of Lattices.
- 4. Evaluate Ideals, principal ideals and dual ideals in a ring.
- 5. Describe the length and covering conditions of lattices.
- 6. Apply the direct products in Lattice theory.

<mark>UNIT I</mark>

Sets and subsets – Relations – Equivalence Classes – Mappings or Functions – Binary Compositions – The Numbers – Mathematical Induction.

<mark>UNIT II</mark>

Diagrammatical Representation of a Poset– Isomorphism – Duality – Product of Two Posets – Semi-lattices – Complete Lattices – Sub lattices.

<mark>UNIT III</mark>

Dual Ideals – Principal Ideals – Principal Dual Ideals – Prime Ideals.

<mark>UNIT IV</mark>

Complements-Length and Covering Conditions–Homomorphism–Quotient Lattices.

<mark>UNIT V</mark>

Direct Products-Ideal Lattice-Isomorphism Theorem-Distributive Lattices-Direct Products.

TEXT BOOK

1. George Gratzer, 2003. General Lattice Theory, Second Edition, Birkhauser Verlag, Germany.

REFERENCE

1.Vijay K Khanna, 2006. Lattices and Boolean Algebras, Vikas publishing house Pvt ltd, Second edition, New Delhi.

15MMU605

ADDITIONAL PAPER-ASTRONOMY

Course Objectives:

The student should be made to:

- Gaina clear knowledge about Astronomy and its applications to the realworld.
- show how astronomical information is collected, processed, interpreted, and shared
- Provide hands-on experience using various types of astronomical tools and instrumentation
- Develop observational and analytical skills.
- Describe the science of cosmology and its relation to other fields of science
- Explain how the scientific method and quantitative arguments are used in cosmology

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Enable the students to understand the General description of the Solar system.
- 2. Describe the ideas of Celestial sphere and its cordinates.
- 3. Understand the theories of Dip, Twilight and Geocentric parallex.
- 4. Apply the Tangent formula and Cassinis formula to find the Refration.
- 5. Apply Kepler"s laws to find the Relation between true eccentric and mean anamolies
- 6. Use analytical and mathematical skills to solve problems

UNIT I

General description of the Solar system. Comets and meteorites – Spherical trigonometry.

UNIT II

Celestial sphere – Celestial co – ordinates – Diurnal motion – Variation in length of the day.

UNIT III

Dip – Twilight – Geocentric parallex

UNIT IV

Refration – Tangent formula – Cassinis formula.

UNIT V

Kepler's laws – Relation between true eccentric and mean anamolies

TEXT BOOK

1.G V Ramachandran, 1965, Text Book of Astronomy, Mission Press, Palayamkottai.

REFERENCE

1.Kumaravelu and Susila KumaraveluS.Kumaravelu, 1984, MurugaBhavanam, Astronomy, Chidambara Nagar, Nagarkoil.

L T PC 15MMU691 PROJECT 10 0 0 5			Semester-VI
	15MMU691	PROJECT	L T PC 10 0 5

Course Objectives:

The student should be made to:

- Know the fundamental concepts of Control systems and mathematical modelling of the system
- The learner gain a clear knowledge about Scalar Product, Backlash, stability analysis
- Understand the concepts of calculus of variations which play an important role in the problems of differential systems.
- Learn the concept of time response and frequency response of the system.
- Teach the fundamental concepts of Control systems and mathematical modelling of the system.
- Teach the basics of stability analysis of the system

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Describe the vector spaces and linear transformations and time state equations.
- 2. Understand the concepts of Linear Continuous time models for Physical systems
- 3. Identify the non-linear and non0linearities in describing function.
- 4. Understand the significance of Stability analysis.
- 5. Analyze the Linear continuous time invariant systems
- 6. Formulate optimal control problems and calculus of variations.

UNIT I

Mathematical preliminaries: Fields, Vectors and Vector Spaces – Linear combinations and Bases – Linear Transformations and Matrices – Scalar Product and Norms – Eigen-values, Eigen Vectors and a Canonical form representation of linear operators

UNIT II

State variable analysis-Linear Continuous time models for Physical systems– Existence and Uniqueness of Solutions to Continuous-Time State Equations – Solutions of Linear Time Invariant Continuous-Time State Equations–State transition matrix and its properties.

UNIT III

Non linear systems-Introduction – Non Linear Systems - Types of Non-Linearities – Saturation – Dead-Zone -Backlash – Jump Phenomenon etc;– Singular Points – Introduction to Linearization of nonlinear systems, Properties of Non-Linear systems – Describing function–describing function analysis of nonlinear systems

UNIT IV

Stability analysis: stability in the sense of Lyapunov, Lyapunov''s stability and Lypanov''s instability theorems -Stability Analysis of the Linear continuous time invariant systems by Lyapunov second method – Generation of Lyapunov functions – Variable gradient method – Krasooviski''s method. State feedback controller design through Pole Assignment – State observers: Full order and Reduced order.

UNIT V

Optimal control: Introduction to optimal control - Formulation of optimal control problems – calculus of variations –fundamental concepts, functional, variation of functional –fundamental theorem of theorem of Calculus of variations – boundary conditions – constrained minimization – formulation using Hamiltonian method – Linear Quadraticregulator.

TEXT BOOKS

1. Modern Control System Theory by M.Gopal - New Age International-1984

2. Modern Control Engineering by Ogata.K – Prentice Hall –1997

REFERENCES

1. Optimal control byKircks

HONOR DEGREE-SOLIDGEOMETRY

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Course Objectives:

The student should be made to:

- Get basic knowledge about Circle, Cone, Parabola, Hyperbola, Ellipse etc.
- Understand the concepts & advance topics related to two & three dimensional geometry
- Study the application of Sphere, cone and cylinder.
- Analyze how to trace the curve.
- Study the geometrical structures and use in to real life problems.
- Develop their inductive and deductive reasoning skills and to apply these skills in the advanced study of geometric relationships

Course Outcomes (COs)

On successful completion of this course, students will be able to

- 1. Construct the conics, Central Conics and Paraboloids with the respective applications.
- 2. Understand geometrical terminology of sphere, radical plane and co-axal system..
- 3. Describe the basic concepts of cone and cylinder
- 4. Use geometrical results to determine the properties of conicoid.
- 5. Recognize the properties of paraboloids and its motions.
- 6. Develop their inductive and deductive reasoning skills in Geometrical figures.

UNIT I

General equation of second degree. Tracing of conics. Tangent at any point to the conic, chord of contact, pole of line to the conic, director circle of conic. System of conics. Confocal conics. Polar equation of a conic, tangent and normal to the conic.

UNIT II

Sphere: Plane section of a sphere. Sphere through a given circle. Intersection of two spheres, radical plane of two spheres. Co-axal system of spheres

UNIT III

Cones. Right circular cone, enveloping cone and reciprocal cone. Cylinder: Right circular cylinder and enveloping cylinder.

UNIT IV

Central Conicoids: Equation of tangent plane. Director sphere. Normal to the conicoids. Polar plane of a point. Enveloping cone of a coincoid. Enveloping cylinder of a coincoid.

UNIT V

Paraboloids: Circular section, Plane sections of conicoids. Generating lines. Confocal conicoid. Reduction of second degree equations.

TEXT BOOK

1. R.J.T. Bill, Elementary Treatise on Coordinary Geometry of Three Dimensions, MacMillan India Ltd.1994.

REFERENCES

1. P.K. Jain and Khalil Ahmad: A Textbook of Analytical Geometry of Three Dimensions, Wiley Eastern Ltd.1999.