Vidya Jyothi Institute of Technology

(An Autonomous Institution) (Accredited by NAAC & NBA, Approved by AICTE New Delhi & Permanently Affiliated to JNTUH) Aziznagar Gate, C.B. Post, Hyderabad-500 075

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



B. Tech(CSE) – Syllabus (R-15)

B. Tech. 1st Year Course Structures Dept. of CSE, ECE and IT (W.E.F. A.Y. 2018-19)

<u>I Year 1st Semester</u>

Subject Code	Course Title	L	T	P	Credits
A21002	Mathematics-I	3	1	0	4.0
A21003	Applied Physics	3	1	0	4.0
A21082	Applied Physics Lab	0	0	3	1.5
A21201	Basic Electrical Engineering	3	0	0	3.0
A21281	Basic Electrical Engineering Lab	0	0	2	1.0
A21301	Engineering Graphics & Modeling	1	0	3	2.5
A21081	English Language Skills Lab (ELSL)	0	0	2	1.0
A21501	Programming for Problem Solving-I	2	0	0	2.0
A21581	Programming for Problem Solving Lab-I	0	0	2	1.0
Total number of Credits			20		

I Year 2nd Semester

Subject Code	Course Title	L	Т	Ρ	Credits	
A22006	Mathematics-II	3	1	0	4.0	
A22008	Chemistry	3	1	0	4.0	
A22086	Chemistry Lab	0	0	3	1.5	
A22005	English	2	0	0	2.0	
A22084	English Communication Skills Lab (ECSL)	0	0	2	1.0	
A22502	Programming for Problem Solving-II	2	0	0	2.0	
A22582	Programming for Problem Solving Lab-II	0	0	2	1.0	
A22382	Engineering Workshop	0	1	3	2.5	
Total number of Credits			18			

ENGLISH (Common for all branches)

B.Tech. | Year

L T P C 2 0 0 2

Learning Objectives: The Course will help to

- Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
- Equip students to study academic subjects more effectively and critically using the theoretical and practical components of English syllabus.
- Develop study skills and communication skills in formal and informal situations.

Course Outcomes: Students should be able to

- Infer the importance of scientific discoveries in promoting social responsibilities.
- Comprehend the given texts and respond appropriately.
- Communicate confidently and transfer information into various forms of writing.
- Understand the importance of health and nutrition.
- Present various form of business writing skills for successful careers.

UNIT – I

A. Vocabulary:

- 1.1: The concept of Word Formation
- 1.2: Synonyms, antonyms, and standard abbreviations.
- B. 'The Raman Effect' from the prescribed textbook 'English for Engineers' published by

Cambridge University Press.

Grammar: Articles & Prepositions

Reading : Reading and Its Importance- Techniques for Effective Reading.

Writing : Organizing principles of paragraphs in documents.

UNIT – II

A. Letter Writing

2.1: Sentence Structures, Use of phrases and clauses in sentences

2.2: Root words and Acquaintance with prefixes and suffixes from foreign languages in

English to form derivatives.

B. 'Ancient Architecture in India' from the prescribed textbook **'English** for Engineers'

published by Cambridge University Press.

Reading: Improving Comprehension Skills – Techniques for Good Comprehension

Writing: Writing Formal Letters - Eg. Letter of Complaint, Letter of Requisition,

Job Application with Resume.

UNIT –III

A. Identifying Common Errors in Writing

3.1: Subject-Verb agreement in number, gender and person 3.2: Information Transfer-Process writing

B. 'Blue Jeans' from the prescribed textbook 'English for Engineers' published by

Cambridge University Press. Grammar: Tenses: Types and uses. Reading: Sub-skills of Reading- Skimming and Scanning

UNIT –IV

- A. Nature and Style of Sensible Writing
 4.1: Describing & Defining
 4.2: Identifying common errors in writing
- What Should You Be Eating' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.
 Reading: Intensive Reading and Extensive Reading

UNIT –V

A. Writing Practices

5.1: Cohesive devices 5.2: Précis Writing

B. 'How a Chinese Billionaire Built Her Fortune' from the prescribed textbook 'English

for Engineers' published by Cambridge University Press.

Vocabulary : Technical Vocabulary and their usage

Reading : Reading Comprehension-Exercises for Practice

Writing : Technical Reports- Introduction – Characteristics of a Report – Categories

of Reports Formats- Structure of Reports (Manuscript Format) -Types of

Report - Writing a Report.

Prescribed Textbook:

1. Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge University Press.

Suggested Readings:

- 1. Green, David. Contemporary English Grammar –Structures and Composition. MacMillan India. 2014 (Print).
- Rizvi, M. Ashraf. Effective Technical Communication. Tata Mc Graw –Hill. 2015 (Print).
- Raman, Meenakshi and Sharma, Sangeeta. "Technical Communication-Principles and Practice". Third Edition. New Delhi: Oxford University Press. 2015. Print.
- 4. Practical English Usage. Michael Swan. OUP. 1995.
- 5. Remedial English Grammar. F.T. Wood. Macmillan.2007.
- 6. On Writing Well. William Zinsser. Harper Resource Book. 2001.
- 7. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
- 8. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
- 9. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press.

ENGLISH LANGUAGE SKILLS LAB

(Common for all branches)

B.Tech I year, I Sem.

0 / 0/2/0/ 1

Course Objectives: The Course will help to

- Engage the students in independent language learning.
- Nurture the fluency of students in spoken English and neutralize their mother tongue influence
- Train students to use language appropriately in formal and informal contexts.

Course Outcomes: Students should be able to

- Reproduce speech sounds and improve fluency of language.
- Understand syllables and consonant clusters for appropriate pronunciation.
- Exhibit effective professional skills with rhetoric eloquence.
- Deliver enthusiastic and well-practiced presentation.
- Learn Task-Based Language Learning (TBLL) through various language learning activities effectively.

Exercise-l

CALL Lab: Introduction to Pronunciation - Speech Sounds, Vowels and Consonants-Practice for Listening

ICS Lab : Ice-Breaking activity and JAM session

Exercise-II

CALL Lab: Silent Letters, Consonant Clusters, Homographs

ICS Lab : Common Everyday Situations: Conversations and Dialogues

Exercise-III

CALL Lab: Syllables

ICS Lab : Communication at Workplace, Social and Professional Etiquette

Exercise-IV

CALL Lab: Word accent and Stress Shifts

ICS Lab : Formal Presentations, Visual Aids in Presentations

Exercise-V

CALL Lab: Intonation, Situational dialogues for practice

ICS Lab : Interviews, Types of Interviews

Minimum Requirement of infra structural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

- i) P -IV Processor
- a) Speed 2.8 GHZ
- b) RAM 512 MB Minimum
- c) Hard Disk 80 GB
- ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab:

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a Digital stereo – audio & video system and Camcorder etc.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

- 1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
- Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
- 3. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
- 4. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
- Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
- 6. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
- 7. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
- 8. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)
- Lab Manual: A Manual entitled "English Language Communication Skills (ELCS) Lab Manual- cum- Work Book", published by Cengage Learning India Pvt. Ltd, New Delhi. 2013.

ENGLISH COMMUNICATION SKILLS LAB

(Common for all branches)

B.Tech I year, II Sem.

L /T/P/D C 0 / 0/2/0/ 1

Course Objectives: The Course will help to

- Differentiate the variations in language pronunciation
- Equip students with necessary training in listening and speaking skills
- Train students to express themselves fluently and appropriately in formal and informal contexts.

Course Outcomes: Students should be able to

- Understand the variants in pronunciation.
- Identify the diverse purposes of listening and speaking.
- Discuss ideas in diverse communicative settings.
- Exhibit increased confidence in public speaking.
- Display critical thinking, problem solving and decision making skills through GD's.

Exercise – I

CALL Lab: Common Indian Variants in Pronunciation – Differences between British and American Pronunciation.

ICS Lab : Spoken vs. Written language-Formal and Informal English- Introducing Oneself and Others.

Exercise – II

CALL Lab: Listening Skill- Its importance – Purpose- Process- Types- Barriers-Effective Listening.

ICS Lab:Features of Good Conversation – Strategies for Effective Communication Role-Play- Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise – III

CALL Lab: Information Transfer

ICS Lab: Descriptions- Narrations- Giving Directions and Guidelines, Giving Instructions – Seeking Clarifications – Asking for and Giving Directions – Thanking and Responding – Agreeing and Disagreeing – Seeking and Giving Advice – Making Suggestions.

Exercise – IV

CALL Lab: Past Tense Marker and Plural Marker

ICS Lab: Public Speaking – Exposure to Structured Talks - Non-verbal Communication-Making a Short Speech – Extempore

Exercise – V CALL Lab: Intonation- Sentence Stress -Weak Forms and Strong Forms. ICS Lab : Group Discussion, Mock Group Discussion sessions

Minimum Requirement of infra structural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

- i) P -IV Processor
- a) Speed 2.8 GHZ
- b) RAM 512 MB Minimum
- c) Hard Disk 80 GB
- ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab:

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo – audio & video system and camcorder etc.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

- 1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation.
- Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
- 3. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill.
- 4. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP.
- Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
- 6. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP.
- 7. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP.
- 8. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan).
- Lab Manual: A Manual entitled "English Language Communication Skills (ELCS) Lab Manual- cum- Work Book", published by Cengage Learning India Pvt. Ltd, New Delhi. 2013.

MATHEMATICS-I (Matrices and Calculus) (Common to all Branches)

I YEAR B.Tech, I SEMESTER

L T/ P/D C 3 1/-/- 4

Course Objectives:

- 1. Determine the rank of the matrix and investigate the solution of system of equations by applying the concepts of consistency.
- 2. Concepts of Eigen values and Eigen vectors and the nature of quadratic form by finding Eigen values.
- 3. Concepts of sequence and series and identifying their nature by applying some tests.
- Mean value theorems geometrical interpretation and their application to the mathematical problems, Evaluation of improper integrals using Beta and Gamma functions
- 5. Partial differentiation, Total derivative and finding maxima minima of functions of several variables.

Course Outcomes: After learning the contents of this course the students must able to:

- 1. Write the matrix representation of system of linear equations and identify the consistency of the system of equations.
- 2. Find the Eigen values and Eigen vectors of the matrix and discuss the nature of the quadratic form.
- 3. Analyse the convergence of sequence and series.
- Discuss the applications of mean value theorems to the mathematical problems, Evaluation of improper integrals using Beta and Gamma functions.
- 5. Examine the extrima of functions of two variables with/ without constraints.

UNIT-I: Matrices and Linear System of Equations

Matrices and Linear system of equations: Real matrices – Symmetric, skew symmetric, Orthogonal. Complex matrices: Hermitian, Skew – Hermitian and Unitary. Rank-Echelon form, Normal form. Solution of Linear Systems – Gauss Elimination, Gauss Jordan & LU Decomposition methods.

UNIT-II: Eigen Values and Eigen Vectors

Eigen values, Eigen vectors – properties, Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonolization of matrix- Quadratic forms: Reduction to Canonical form, Nature, Index, Signature.

UNIT-III: Sequences & Series

Basic definitions of Sequences and series, Convergence and divergence, Ratio test, Comparison test, Cauchy's root test, Raabe's test, Integral test ,Absolute and conditional convergence.

UNIT-IV: Beta & Gamma Functions and Mean Value Theorems

Gamma and Beta Functions-Relation between them, their properties – evaluation of improper integrals using Gamma/ Beta functions.

Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Generalized Mean Value theorem (all theorems without proof) – Geometrical interpretation of Mean value theorems.

UNIT-V: Functions of several variables

Partial Differentiation and total differentiation, Functional dependence, Jacobian Determinant- Maxima and Minima of functions of two variables with constraints and without constraints, Method of Lagrange Multipliers.

TEXTBOOKS:

- 1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
- 2. Advanced Engineering Mathematics by Jain & Iyengar Narosa Publications.
- Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

REFERENCES:

- 1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
- Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
- 3. Srimanta Pal and Subodh C. Bhunia, Engineering Mathematics, Oxford University Press, 2015.
- **4.** Advanced Engineering Mathematics (2nd Edition) Michael D.Greenberg.

MATHEMATICS-II (ORIDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS) (COMMON TO ALL BRANCHES)

I YEAR B.Tech, II SEMESTER

L T/P/D C 3 1/-/- 4

Course Objectives:

- 1. Methods of solving the differential equations of first and higher orders.
- 2. Properties of Laplace Transforms, Laplace Transforms of various functions and finding the solutions of differential equations using Laplace Transforms.
- 3. Evaluation of multiple integrals.
- 4. The basic properties of vector valued functions and their applications to line, surface and volume integrals.

Course Outcomes: After learning the contents of this course the students must be able to:

- 1. Classify the various types of differential equations of first order and first degree and apply the concepts of differential equations to the real world problems.
- 2. Solve higher order differential equations and apply the concepts of differential equations to the real world problems.
- 3. Find the Laplace Transform of various functions and apply to find the solutions of differential equations.
- 4. Evaluate the multiple integrals and identify the vector differential operators physically in engineering problems.
- 5. Evaluate the line, surface and volume integrals and converting them from one to another by using vector integral theorems.

UNIT-I: First order ODE and their Applications

Formation of Differential equations, Differential equations of first order and first degree: exact, linear and Bernoulli, Applications of ODE: Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

UNIT-II: Higher Order Linear Differential Equations

Linear differential equations of second and higher order with constant coefficients, RHS term of the type $f(X) = e^{ax}$, $\sin ax$, $\cos ax$ and x^k , $e^{ax}V(x)$, $x^kV(x)$. Method of variation of parameters.

UNIT-III: Laplace transforms

Laplace transform of standard functions – Inverse transform – first shifting Theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Convolution theorem – Periodic function - Differentiation and integration of transforms – Application of Laplace transforms to ordinary differential equations.

UNIT-IV: Multiple Integrals & Vector Differentiation

Multiple integrals - double and triple integrals – change of order of integration (Only Cartesian form)- change of variables (Cartesian to Polar for double integral, Cartesian to Spherical for triple integral). Gradient- Divergence- Curl and their related properties - Potential function - Laplacian and second order operators.

UNIT-V: Vector Integration

Line integral, work done, Surface and Volume integrals. Vector integrals theorems: Green's, Stoke's and Gauss Divergence Theorems (Only Statements & their Verifications).

TEXTBOOKS:

- B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
- 2. Advanced Engineering Mathematics by Jain & Iyengar Narosa Publications.
- Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

REFERENCES:

- 1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
- Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
- 3. Srimanta Pal and Subodh C. Bhunia, Engineering Mathematics, Oxford University Press, 2015.
- 4. Advanced Engineering Mathematics (2nd Edition) Michael D.Greenberg

Applied Physics (Common to ECE, CSE & IT)

l year B.Tech. I-Sem.

L T P C 3 1 0 4

Course Outcomes

At the end of the course the student will be able to

- 1. Identify various optical phenomena of light
- 2. Describe the basic principles of quantum mechanics
- 3. Classify solids based on the band theory
- 4. Elucidate the characteristics of semiconductors and semiconductor devices
- 5. Explain the working principle of lasers and optical fibers

Unit – I Wave Optics

Principle of Superposition, coherence and methods to produce coherent sources, Interference - Interference in thin films by reflection, Newton's Rings. Diffraction – Fraunhofer and Fresnel Diffraction, Farunhofer diffraction due to single slit, Plane Diffraction Grating, resolving power of Grating. Polarization – Polarization of light waves, Plane of vibration, plane of polarization, Double refraction, Nicol's Prism, Applications of Polarization.

UNIT-II Introduction to Quantum Mechanics and free electron theory

Classical free electron Theory, Electrical Conductivity and Ohm's Law – Drawbacks, Sommerfeld theory (Qualitative). Introduction to quantum physics: Black body radiation and Planck's Law(Qualitative), wave-particle duality, de-Broglie hypothesis of matter waves, Davisson and Germer experiment, Heisenberg uncertainty principle, time independent Schrodinger equation, Born interpretation of wave function, particle in an infinite potential well (one dimension).

UNIT-III Band theory of solids and semiconductors

Kronig-Penny model(Qualitative), E-k diagram, Energy bands in solids, classification of materials into metals, semiconductors, and insulators, Effective mass, Density of States, Fermi distribution function, Fermi level and its importance. Intrinsic semiconductors, carrier concentration in intrinsic semiconductors, energy band diagram and position of Fermi level in intrinsic semiconductors, equation for electrical conductivity of semiconductors, extrinsic semiconductors.

UNIT-IV Semiconductor Devices

Direct and indirect band-gap semiconductors, Formation of p-n junction, energy diagram of PN junction, I-V characteristics of PN junction diode, Photo diode, solar cell-efficiency, light emitting diode and their characteristics, semiconductor laser: device structure and characteristics, Hall effect and its applications.

UNIT-V Fiber Optics and Lasers

Introduction, total internal reflection, acceptance angle and numerical aperture, losses associated with optical fibers, step and graded index fibers, applications of optical fibers. Introduction to interaction of radiation with matter: stimulated absorption, spontaneous emission and stimulated emission, Einstein's coefficients and their relations, characteristics of a laser, important components of a laser: active medium, pumping source, optical resonator. Population inversion, Ruby laser, He-Ne laser, applications of lasers.

<u>Text books:</u>

- i. A Text book of Engineering Physics by M N Avadhanulu, P G Kshirsagar; S Chand.
- ii. Engineering Physics by B K Pandey and S Chaturvedi; CENGAGE Learning.
- Engineering Physics by D K Bhattacharya and PoonamTandon; OXFORD University Press.
- iv. Engineering Physics by P K Palanisamy :Scietech publication
- v. Optics by A. Ghatak.

<u>Reference books:</u>

- i. Quantum mechanics by Leonard Schiff.
- ii. Introduction to Solid State Physics by Charles Kittel : John Wiley & Sons
- iii. Principles of Lasers, O. Svelto,
- iv. Solid State Physics by M Armugam; Anuradha Publications
- v. Semiconductor Devices, S. M. Sze, Wiley (2008).
- vi. Semiconductor Optoelectronics, J. Singh, McGraw-Hill Inc. (1995).

Applied Physics Lab (Common to CSE, ECE & IT)

L T P C 0 0 3 1.5

B.Tech I-year I-sem

Course Outcomes

At the end of the course the student will be able to

- 1. Apply the optical phenomena to characterize optical sources and components.
- 2. Determine the energy gap of a semiconductor diode and time constant of RC circuit.
- 3. Describe the electrical characteristics of PN junction diode, photodiode, LED and solar cell.
- 4. Demonstrate the resonance in mechanical and electrical waves.
- 5. Identify the magnetic induction along the axis of current carrying coil.

LIST OF EXPERIMENTS

- 1. Newton's rings: Determination of the radius of curvature of the lens by forming Newton's rings
- 2. Diffraction grating: To determine the number of lines per inch of the grating.
- 3. Dispersive power: To determine the dispersive power of prism by using spectrometer.
- 4. Single Slit Diffraction using Laser- Determination of wavelength of a Monochromatic Source (LASER).
- 5. Energy gap of P-N junction diode: Determination of the energy gap of a semiconductor diode.
- 6. Photo diode: Study the V-I Characteristics of Photo diode.
- 7. Light emitting diode: Plot V-I and P-I characteristics of light emitting diode.
- 8. Solar cell: Study the V-I Characteristics of Solar cell.
- 9. Stewart & Gee's experiment Determination of magnetic induction along the axis of current carrying coil.
- 10. LCR Circuit- Determination of the Resonance frequency of forced electrical oscillator.
- 11. RC- Circuit Determination of the time constant of RC-circuit.
- 12. Optical fiber: Determination of the Numerical aperture of Optical fiber. Note: Any 10 experiments are to be performed

Reference Text Books:

- 1. Engineering Physics Theory and Practical, C. K. Pandey, A. K. Katiyar
- 2. Engineering Physics Lab Manual, C. V. Madhusudan Rao
- 3. Practical Physics for Engineering students, T. Radha Krishna, V. Rajeshwar Rao

Engineering Physics (Common to Civil, EEE & Mech.)

I year B. Tech II-Sem.

Course Outcomes

At the end of the course the student will be able to

- 1. Interpret the forced damped harmonic oscillations and Transverse waves
- 2. Identify various optical phenomena of light
- 3. Explain the working principle of optical fibers and lasers
- 4. Describe the crystalline structures of solids
- 5. Classify magnetic and dielectric behavior of materials

UNIT-I Oscillations and Waves

Simple harmonic motion, equation of simple harmonic motion, Simple Pendulum, Torsional pendulum, damped harmonic motion-heavy, critical and light damping, energy decay in a damped harmonic oscillator, power dissipation, quality factor. Forced vibration, steady state motion of forced damped harmonic oscillator, Amplitude of forced vibration, Resonance, Electrical analogy of simple harmonic oscillator. Transverse waves in a stretched string, differential equation, reflection and transmission of transverse waves at a boundary, standing waves.

UNIT-II Wave Optics

Huygen's principle, superposition of waves, coherence and methods to produce coherent sources, young's double slit experiment, interference by parallel thin film by reflection, Newton's rings. Diffraction: Introduction, Fraunhofer diffraction at single slit, plane diffraction Gratings and its resolving power. Polarization: Introduction, methods of polarization, double refraction- Nicol Prism.

UNIT-III Fiber Optics and Lasers

Introduction, total internal reflection, acceptance angle and numerical aperture, losses associated with optical fibers, step and graded index fibers, applications of optical fibers. Introduction to interaction of radiation with matter: stimulated absorption, spontaneous emission and stimulated emission, Einstein's coefficients and their relation, characteristics of a laser, components of a laser: active medium, pumping source, optical resonator. Population inversion, Construction and working of Ruby laser, He-Ne laser and Semiconductor laser. Applications of lasers.

L T P C 3 1 0 4

UNIT-IV Crystal Structures, Crystal Planes and XRD

Space lattice – Unit cell – Lattice parameter – Crystal systems – Bravais lattices, Atomic radius – Co-ordination number - Structures and Packing fractions of Simple Cubic – Body Centered Cubic – Face Centered Cubic crystals. Miller Indices for Crystal planes and directions – Inter planar spacing of orthogonal crystal systems –Diffraction of X-rays by crystal planes and Bragg's law–Powder method – Applications of X-ray diffraction.

UNIT-V Dielectric and Magnetic properties of Materials

Dielectric polarization, permittivity and dielectric constant, polar and non-polar dielectrics, Electronic, Ionic and Orientation Polarization – Calculation of electronic and Ionic Polarizability – Internal fields – Claussius – Mossotti equation – Basic concepts of Piezo, Pyro and Ferro electricity, applications of dielectrics. Introduction to magnetism – Basic definitions - Origin of magnetic moment, Bohr magneton – Classification of magnetic materials (Dia, Para and Ferro)- Domain theory of ferromagnetism, Hysteresis curve – Soft and Hard magnetic materials – properties of Anti ferro and Ferri magnetic materials, applications.

<u>Text books:</u>

- i. A Text book of Engineering Physics by M N Avadhanulu, P G Kshirsagar; S Chand.
- ii. Engineering Physics by B K Pandey and S Chaturvedi; CENGAGE Learning.
- Engineering Physics by D K Bhattacharya and PoonamTandon; OXFORD University Press.
- iv. Engineering Mechanics, 2nd ed.- MK Harbola, Cengage Learning
- vi. Optics by A. Ghatak.
- v. Engineering Physics by P K palanisamy :Scietech publication

Reference books:

- i. Oscillations and waves in physics, Ian G. Main
- ii. The physics of vibrations and waves, H.J. Pain
- iii. Optics, A. Ghatak
- iv. Principles of Lasers, O. Svelto
- v. Introduction to Mechanics, M.K.Verma, Universities Press
- vi. Introduction to Solid State Physics by Charles Kittel : John Wiley & Sons
- vii. Solid State Physics by M Armugam; Anuradha Publications
- viii. The physics of vibrations and waves , H. J. Pain
- ix. An Introduction to Mechanics D Kleppner & R Kolenkow.

Engineering Physics Lab (Common to Civil, EEE & Mech.)

I year B.Tech II Sem

L T P C 0 0 3 1.5

Course Outcomes

At the end of the course the student will be able to

- 1. Characterize the mechanical properties of given material
- 2. Demonstrate various types of oscillation and rotational motion to determine the mechanical parameters
- 3. Identify the magnetic induction along the axis of current carrying coil
- 4. Apply the optical phenomena to characterize optical sources and components
- 5. Describe the electrical characteristics LCR and RC circuits.

LIST OF EXPERIMENTS

- 1. Torsional pendulum: Determination of Rigidity modulus of a material
- 2. Fly-wheel : Determination of moment of Inertia
- 3. Melde's Experiment: Determination of frequency of electrically maintained tuning fork
- 4. Sonometer: Determination of velocity of Transverse wave in a string
- 5. Newton's rings: Determination of the radius of curvature of the given lens by forming Newton's rings
- 6. Diffraction grating: Determination of wavelength of given light using diffraction grating
- 7. Dispersive power: Determination of dispersive power of the prism material using spectrometer
- 8. Single Slit Diffraction using Lasers- Determination of Wavelength of a Monochromatic Source.
- 9. Stewart & Gee's experiment: Determination of magnetic induction along the axis of current carrying coil
- 10. LCR Circuit: Determination of Resonance frequency of forced electrical oscillator
- 11. RC- Circuit: Determination of time constant of RC-circuit
- 12. Optical Fiber: Determination of Numerical Aperture of Optical Fiber.

Note: Any 10 experiments are to be performed

Reference Text Books:

- 1. Engineering Physics Theory and Practical, C. K. Pandey, A. K. Katiyar
- 2. Engineering Physics Lab Manual, C. V. Madhusudan Rao
- 3. Practical Physics for Engineering students, T. Radha Krishna, V. Rajeshwar Rao

Chemistry (Common to all branches)

B.Tech I-Year

L/T/P C 3/1/- 4

Course Objectives:

- 1. To bring adaptability to the concepts of chemistry and to acquire the required skills to become perfect engineer.
- To impart the basic knowledge of atomic, molecular and electronic modifications which make the students to understand the technology based on them.
- To acquire the knowledge of electrochemistry, corrosion, polymers and water treatment which are essential for the engineers and in industry.
- 4. To impart the knowledge of stereochemistry and synthetic aspects useful for understanding reaction pathways.

Course Outcomes:

The course will enable the student to:

- 1. Acquire knowledge of atomic, molecular and electronic changes related to conductivity.
- 2. Apply the various processes of treatment of water for both domestic and industrial purpose.
- 3. Apply the knowledge of electrode potentials for the protection of metals from corrosion.
- 4. Analyze the major chemical reactions that are used in the synthesis of compounds.
- 5. Apply the knowledge of polymers in every day's life.

UNIT (I) Atomic and molecular structure

Introduction, Concept of atomic and molecular orbitals, Crystal field theory-Crystal field splitting patterns of transition metal ion d- orbital- tetrahedral & octahedral geometries.

LCAO, Molecular orbitals of di-atomicmolecules, Molecular orbital energy level diagrams of diatomic molecules (N₂, O2 & F_2). Pi-molecular orbitals of butadiene and benzene.

UNIT II: Water Technology

Hardness of water, expression of hardness (CaCO₃ equivalent), units and types of hardness. Estimation of temporary and permanent hardness of water by EDTA method. Numerical problems based on hardness of water. Potable water: characteristics, treatment of water for domestic supply. Desalination of brackish water: reverse osmosis. Alkalinity of water and its determination. Boiler feed water and its treatment: Internal treatment (colloidal, phosphate calgon conditioning of water). External treatment (ion –exchange process).

UNIT (III): Electrochemistry and corrosion

Electrode, electrode potential, galvanic cell, cell reactions and cell notation, cell EMF, types of electrodes (Calomel electrode and Quinhydrone electrode), Determination of P^H using quinhydrone electrode. Nernst equation, Numerical problems.

BATTERIES: Introduction to cell and battery, Primary (lithium cell) and secondary cells, (lead-Acid cell, and Lithium ion cells). Fuel cells – Methanol – Oxygen fuel cell, advantages and engineering applications of fuel cells.

Corrosion: Introduction, types of corrosion: chemical and electrochemical corrosion, factors affecting the rate of corrosion: nature of the metal, position of metal in galvanic series, purity of metal, nature of corrosion product, nature of environment: effect of temperature, effect of pH, humidity. Corrosion control methods: Cathodic protection: sacrificial anode method and impressed current cathode method. Protective coatings: metallic coatings (anodic and cathodic), methods of application on metals- electroless plating (of Ni).

UNIT (IV): Stereochemistry

Structural isomers and stereoisomers, configurations, symmetry and chirality, enantiomers, diastereomers, optical activity. Conformations of n-butane.

Organic reactions and synthesis of a drug molecule

Introduction to reactions involving substitution (SN1 & SN2), addition (addition of HBr to propene, Markownikoff and Anti Markownikoff addition), elimination, oxidation (oxidation of alcoholsusing KMnO₄ & CrO₃), reduction (reduction of carbonyl compounds by LiAlH₄ & NaBH₄). Synthesis of a commonly used drug molecule- paracetamol and Asprin.

UNIT (V): Polymer Chemistry

Introduction, classification of polymers, types of polymerization (addition and condensation, mechanisms not included). Plastics- types of plastics -thermoplastics and thermosetting plastics. Preparation, properties and engineering applications of PVC, Teflon and Bakelite. Fibers: Nylon 6, 6 and Terelene (Dacron). Elastomers: natural rubber, structure, vulcanization. Synthetic rubbers: Buna-S & Butyl rubber.Conducting polymers: classification, polyacetylene and applications.

Biodegradable polymers: Types, examples: Polyhydroxy butyrate (PHB), Polyglycolic acid (PGA), Polylactic acid (PLA). Applications of biodegradable polymers.

Text Books:

- (i) Engineering Chemistry by P.C Jain & Monica Jain, Dhanpat Rai Publishing Company.
- (ii) Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publishing Company.

Reference Books:

- (i) Physical Chemistry, by P. W. Atkins
- (ii) Text book of Engineering Chemistry by Dr.M.Tirumala Chary & Dr. E.Laxminarayana.
- (iii) Engineering Chemistry (NPTEL Web-book), by B.L. Tembe, Kamaluddin and M.S.Krishnan

CHEMISTRY LABORATORY

(Common to all branches)

B.Tech I-Year

L T P C 0 0 3 1.5

Laboratory Objectives:

The course consists of experiments related to the principles of chemistry required for engineering students. The student will learn:

- Estimation of hardness and chloride content in water to check its suitability for drinking purpose.
- To determine the rate constant of reactions from concentrations as a function of time.
- The measurement of physical properties like adsorption, surface tension & viscosity.
- To analyze the salt and also to synthesize drug molecules.

Laboratory Outcomes:

The experiments will make the student gain skills on:

- Determination of parameters like hardness, alkalinity and chloride content in water.
- Estimation of rate constant of a reaction from concentration-time relationships.
- Determination of physical properties like adsorption, surface tension and viscosity.
- Synthesize a small drug molecule and analyse a salt sample
- Calculation of strength of compound using instrumentation techniques.

Choice of 10-12 experiments from the following:

- 1. Estimation of total hardness of water by complex metric method using EDTA.
- 2. Determination of alkalinity of water
- 3. Determination of chloride content of water by Argentometry.
- 4. Estimation of HCl by conductometric titration
- 5. Estimation of mixture of acids by conductometric titration
- 6. Estimation of HCl by potentiometric titration
- 7. Estimation of Fe²⁺ by potentiometry using KMnO₄
- 8. Determination of the rate constant of a reaction.
- 9. Determination of surface tension by stalagmometer.

- 10. Determination of viscosity of a liquid by Ostwald's viscometer.
- 11. Synthesis of an Aspirin and Paracetamol.
- 12. Verification of Freundlich adsorption isotherm-adsorption of aceticacid on charcoal.
- 13. Determination of acid value of an oil
- 14. Chemical analysis of an inorganic salt.

TEXT BOOKS:

- 1. Vogel's Textbook of Quantitative Chemical Analysis
- 2. Essentials of experimental engineering chemistry, Shashi Chawla, Dhanpat Rai & Co

REFERENCE BOOKS:

- 1. Text Book of engineering chemistry by R. N. Goyal and Harrmendra Goel.
- 2. A text book on experiments and calculations. S.S. Dara.

PROGRAMMING FOR PROBLEM SOLVING-I

(Common to all Branches)

B.Tech. I-Year, I-Sem.	L	т	Ρ	С
	2	-	-	2

Course Outcomes: At the end of this course, the student would be able to

- CO. 1 Design algorithms and flowcharts for real world applications using 'C'.
- CO. 2 Know the usage of various operators in Program development.
- CO. 3 Design programs involving decision and iteration structures.
- CO. 4 Apply the concepts code reusability using Functions .
- CO. 5 Analyze various searching and sorting techniques using Arrays .

UNIT - I

Problem Solving Using Computers: Introduction, Algorithms, Flowcharts and Pseudo code.

Overview of C Language: Introduction, Salient Features of C Language, Structure of a "C" Program.

C-Language Preliminaries: Keywords and Identifiers, Constants, Variables, Data Types, and Input/ Output Statements with suitable illustrative "C" Programs.

UNIT-II

Operators: Assignment Operators, Relational and Logical Operators, Increment and Decrement Operators, Bitwise Operators, Ternary Operator, Type Conversion, Precedence and Associativity with suitable illustrative "C" Programs.

UNIT-III

Statements in C:

Conditional/Decision Statements: if, if-else, Nested if-else, else-if ladder and Switch-Statement with suitable illustrative "C" Programs.

Loop Control Statements: while, do-while and for with suitable illustrative "C" Programs.

UNIT-1V

Functions: Introduction to Functions, benefits of functions, types of functions, Function calls, return vs exit (), Parameter Passing mechanisms, Call-by-Value, Recursion, Storage Classes.

UNIT-V

Arrays: Introduction to Arrays, One-Dimensional Arrays, Two-Dimensional Arrays, Arrays and Functions.

Searching and Sorting: Linear Search, Binary Search, Bubble Sort, Insertion Sort.

Text Books:

- 1. B.A.Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Third edition, CENGAGE Learning, 2016.
- 2. Ashok N. Kamthane, "C and Data Structures", Pearson Education, 2010.

Reference Books:

- 1. M.T.Somashekara, "Problem Solving Using C", PHI, 2 nd Edition, 2009.
- 2. A.K.Sharma, Computer Fundamentals and Programming in C, 2nd Edition, University Press.
- 3. Pradip Dey and Manas Ghosh, "Programming in C 2/e", Oxford University Press, 2nd Edition, 2011.
- 4. Rajaraman V., "The Fundamentals of Computers", 4th Edition, Prentice Hall of India, 2006.
- 5. R S Bichker, "Programming in C", University Press, 2012.

PROGRAMMING FOR PROBLEM SOLVING LAB – I

(Common to all Branches)

B.Tech. I-Year, I-Sem.			Р	С
	-	-	2	1
Course Outcomes: At the end of this course, the student				

would be able to

- CO 1: Apply the specification of syntax rules for numerical constants , variables and data types.
- CO 2: Know the Usage of various operators and other C constructs.
- CO 3: Design programs on decision and control constructs.
- CO 4: Develop programs on code reusability using functions.
- CO 5: Implement various searching and sorting algorithms using arrays.

Week 1:

Ubuntu and Linux Commands

Week 2:

Designing of flowcharts and algorithms using raptor tool

- 1. Areas of Polygons
- 2. Calculation of Simple and Compound Interest
- 3. Swapping of Two numbers with and without temporary variable
- 4. Checking whether a number is even or odd
- 5. Sum of first 'n' natural numbers
- 6. Checking a number whether it is divisible by any given number
- 7. Evaluation of mathematical expressions
- 8. Programs using scanf () and printf () statements

Week 3:

Programs on operators

Week 4, 5 & 6:

Programs on Conditional Statements

Week 7-9:

Programs on Control Statements

Week 10 &11:

Programs on Functions

Week 12:

Programs on One Dimensional Arrays

Week 13:

Programs on Two Dimensional Arrays

Week 14:

Implementation of Linear Search and Binary Search

Week 15:

Implementation of Bubble Sort and Insertion Sort

Week 16:

Review

PROGRAMMING FOR PROBLEM SOLVING-II (Common to all Branches)

B.Tech I-Year, II-Sem. L T P C 2 - - 2

Course Outcomes: At the end of this course, the student would be able to

- CO. 1 Identify various string handling functions in 'C'.
- CO. 2 Develop programs with user defined data types.
- CO. 3 Use dynamic memory allocation functions with pointers.
- CO. 4 Distinguish between stacks and queues.
- CO. 5 Analyze various dynamic data structures.

UNIT – I

Overview of Arrays and Functions

Strings: Introduction to Strings, String I/O, String Operations with and without built-in functions (strlen (), strcmp (), strcat (), strcpy(), and strrev()).

UNIT -II

Structures: Definition and Initialization of Structures, Accessing structure members, Nested Structures, Array of Structures, Structures and Functions, Unions, typedef, Enumerated Data types.

UNIT-III

Pointers: Introduction to Pointers, Pointer Arithmetic, Pointers and Arrays, Pointers to Structures, Pointers and Strings, Function - Call by Reference, Pointers to Pointers, Dynamic Memory Allocation.

UNIT-IV:

Introduction to Data Structures: Lists and Operations, Linear and Nonlinear Data structures.

Stacks- Introduction to Stacks, Operations, Implementation of Stack using Arrays. **Queues-** Introduction to Queues, Operations, Implementation of Queues using Arrays.

UNIT-V

Linked Lists: Introduction to Linked List, Operations on Single Linked List (Search, Insertion & Deletion)

Files: Introduction to Files, File Operations (open, close, read & write).

Text Books:

- 1. B.A.Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Third edition, 2016.
- 2. Ashok N. Kamthane, "C and Data Structures", Pearson Education, 2010.

Reference Books:

- 1. M.T.Somashekara, "Problem Solving Using C", PHI, 2 nd Edition, 2009.
- 2. A.K.Sharma, Computer Fundamentals and Programming in C, 2nd Edition, University Press.
- 3. PradipDey and Manas Ghosh, "Programming in C 2/e", Oxford University Press, 2nd Edition, 2011.
- 4. Rajaraman V, "The Fundamentals of Computers", 4th Edition, Prentice Hall of India, 2006.
- 5. R S Bichker, "Programming in C", University Press, 2012.

PROGRAMMING FOR PROBLEM SOLVING LAB – II (Common to all Branches)

B.Tech. I-Year II-Sem.

L T P C - - 2 1

Course Outcomes: At the end of this course, the student would be able to

CO 1: Build programs on various string handling functions.

- CO 2: Develop applications on user defined data types.
- CO 3: Apply dynamic memory allocation through pointers.
- CO 4: Implement linear data structures through stacks and queues.
- CO 5: Create linked list dynamically through stacks and queues.

Week 1:

Overview of Arrays and Functions

Week 2 & 3:

Programs on Strings with and without string built-in Functions

Week 4:

Programs on Accessing Structures and Nested Structures

Week 5 & 6:

Array of Structures, Structures and Functions

Week 7:

Unions, typedef and enum

Week 8:

Programs on pointers with its implementation, pointer arithmetic, pointer expression and Single Dimensional and Two dimensional array programs

Week 9:

Pointers to structures, Programs on Call by Value and Reference, Pointers to Pointers

Week 10:

Programs on Dynamic Memory Allocation Functions.

Week 11:

Programs on Stacks and Queues Using Arrays

Week 12 & 13: Single Linked List Programs

Week 14 & 15: Programs on File Operations

Week 16: Review

BASIC ELECTRICAL ENGINEERING (Common to EEE, ECE, CSE and IT)

l Year B.Tech

L T P C 3 1 0 3

Course Objectives:

- To impart knowledge of basic electrical equipment
- To introduce the concept of electrical circuits and its components.
- To impart the knowledge of AC circuits, Phasor algebra related to alternating quantities
- To acquaint the students with principles of operation of transformers, Electrical machines and electrical installations

Course Outcomes:

At the end of the course, students will be the able to

- Understand basic electrical equipment.
- Analyze basic electric circuits with DC and AC circuits.
- Understand working principles of electric machines and electrical installations

UNIT-I Introduction to Electrical Engineering and DC Circuits:

Basic definitions, types of elements, types of sources, Kirchhoff's Laws, resistive networks, inductive networks, series, parallel circuits, Star- Delta and Delta- Star transformation, Network theorems- Superposition, Thevenin's - simple problems.

UNIT-II AC Circuits:

Representation of sinusoidal waveforms, peak, rms and average values. Elementary treatment of single-phase AC circuits consisting of R, R-L, R-C, R-L-C combinations (series and parallel). Phase representation, real power, reactive power, apparent power, resonance concept. Three-phase balanced circuits, voltage and current relations in star and delta connections.

UNIT –III: Magnetic Circuits & Transformers:

Magnetic circuits: Magnetic materials, Faraday's laws of Electromagnetic Induction, BH characteristics, Magnetic Circuits - concept of Self & Mutual Inductance.

Transformers:

Ideal and practical single phase transformer, OC-SC tests, equivalent circuit, losses in transformer, regulation and efficiency - simple problems.

UNTI-IV: DC Machines and Induction Motors:

DC Machines:

Construction, Principle and Operation of DC Motor, Voltage- torque equations - simple problems

Three Phase Induction Motor:

Construction, Principle and working of three phase Induction Motor, torque slip characteristics, -simple problems.

Single Phase Induction Motor

Single phase Induction Motor construction and working principle, capacitor start - applications

UNIT –V: AC Generator & Electrical Installation:

AC Generator

Construction, Principle of operation of Synchronous Generator, Pitch Factor-Distribution Factor (or winding factor) - EMF equation – simple problems.

Electrical Installation:

Fuse, Circuit breakers, difference between fuse and circuit breaker, Types of Batteries, battery backup.

TEXT BOOKS:

- 1. Basic Electrical Engineering-By M.S. Naidu and S. Kamakshiah-TMH.
- 2. Network Analysis by Sudhakar & Shyam Mohan.
- Basic Electrical Engineering by T.K. Nagasarkar and M.S. Sukhija, Oxford University press.
- 4. Electrical and Electronics technology- By Hughes-Pearson Education.
- 5. Basic Electrical Engineering by K.Uma Rao and A.Jayalakshmi, IK Publications.

REFERENCE BOOKS:

- Theory and problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath, PHI.
- Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin Pearson.
- 3. L.S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
- 4. E. Hughes, "Electrical & Electronics Technology", Pearson, 2010.
- 5. V.D. Toro, "Electrical Engineering Fundamental", Prentice Hall India, 1989.

BASIC ELECTRICAL ENGINEERING LABORATORY (Common to EEE, ECE, CSE and IT)

I-Year B.Tech.

L T P C 0 0 3 2

Course Objectives:

- To analyze a given network by applying various electrical laws and network theorems
- To know the response of electrical circuits for different excitations
- To calculate, measure and know the relation between basic electrical parameters.
- To analyze the performance characteristics of DC and AC electrical machines

Course Outcomes:

- Get an exposure to basic electrical laws.
- Understand the response of different types of electrical circuits to different excitations.
- Understand the measurement, calculation and relation between the basic electrical parameters
- Understand the basic characteristics of transformers and electrical machines.

List of experiments/ demonstrations

Any 5 experiments from Part-A and Part-B should be conducted (Total 10 Experiments)

Part-A

- 1. Verification of Ohms law
- 2. Verification of KVL and KCL
- 3. Verification of Thevenin's Theorem
- 4. Verification of Superposition Theorem
- 5. Transient Response of Series R- L and R C circuits using DC excitation
- 6. Determination and Verification of Impedance and Current of RL and RC series circuits

Part-B

- 1. Transient Response of R-L-C Series circuit using DC excitation
- 2. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
- 3. OC & SC Test on Single phase transformer
- 4. Brake test on DC shunt motor
- 5. Brake test on Three Phase Squirrel cage induction motor.
- 6. OCC of Three phase alternator.

REFERENCE BOOKS:

- 1. Sudhakar and Shyam Mohan, "Circuits and Networks" Tata Mc Graw Hill Companies.
- 2. P.S.Bimbra, "Electrical Machines", Khanna Publishers.

ENGINEERING GRAPHICS & MODELING

(Common to all branches)

l Year B.Tech.

L T/P C 1 3 2 5

Course Outcomes:

All phases of manufacturing or construction require the conversion of new ideas and design concepts into the basic line language of graphics. Therefore, there are many areas (civil, mechanical, electrical, architectural and industrial) in which the skills of the CAD technicians play major roles in the design and development of new products or construction. Students prepare for actual work situations through practical training in a new state-of-the-art computer designed CAD laboratory using engineering software.

The student will learn:

Introduction to engineering design and its place in society Exposure to the visual aspects of engineering design Exposure to engineering graphics standards Exposure to solid modeling Exposure to computer-aided geometric design Exposure to creating working drawings Exposure to engineering communication

UNIT – I

Principles of Engineering Graphics and their significance, usage of Drawing instruments, Conic sections including the Rectangular Hyperbola (General method only), Cycloid, Epicycloid, Hypocycloid and Involute. Scales -plane and diagonal only.

Introduction to CAD: Introduction to CAD software and its importance, standard toolbar/menus and navigation tools used in the software .using commands LIMITS ,UNITS, GRID,TEST ,MOVE,OFFSET ,MIIROR,ROTATE, TRIM, EXTEND, FILLET etc. Drawing lines using line command. Drawing Spline, Ellipse, Circle, Rectangle etc. Concept of layers and Dimensioning.

UNIT – II

Principles of orthographic projections – Conventions. Projections of points, projections of lines (first angle projection) inclined to both planes (traces and midpoint problem to be excluded).

Implementation in CAD: Drawing orthographic projections of points and lines using CAD package.

UNIT – III

Projections of Planes: Projections of planes inclined to both the planes. Projections of Solids: Projections of regular solids inclined to both the planes (prisms, pyramids, cones and cylinders, Change of potion method only). *Implementation in CAD*: Drawing orthographic projection of planes and solids using CAD package.

UNIT – IV

Sections and Sectional Views of Right Angular Solids of Prism, Cylinder, Pyramid, Cone – Auxiliary Views; Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone, Draw the sectional orthographic views of geometrical solids.

Implementation in CAD: Concept of hatching, drawing sectional views of solids and development of right regular solids using CAD package.

UNIT – V

Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions, Isometric Views of lines, Planes, Simple and compound Solids, Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions.

Implementation in CAD: Drawing isometric views of simple and compound solids. Drawing isometric views from given orthographic views and vice-versa using CAD package.

Note: Implementation in CAD (For Internal Evaluation Weightage Only)

Suggested Text/ Reference Books:

- Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House.
- 2. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education.
- Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers.
- 4. CAD Software Theory and User Manuals.
ENGINEERING WORKSHOP (Common to all branches)

I-Year B.Tech.

L T/ P C 0 4 2 5

(i) Lectures & videos: (10 hours) Course Outcomes

Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials

Detailed contents

- 1. Manufacturing Methods- Metal Forming, Machining, Advanced manufacturing methods (2 lectures)
- 2. CNC machining, Additive manufacturing (2 lectures)
- 3. Fitting operations & power tools (1 lecture)
- 4. House wiring (1 lecture)
- 5. Carpentry (1 lecture)
- 6. Plastic moulding (1 lecture)
- 7. Metal casting (1 lecture)
- 8. Welding (1 Lecture)

(ii) Workshop Practice:

Laboratory Outcomes:

- ✓ Upon completion of this laboratory course, students will be able to fabricate components with their own hands.
- ✓ They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.
- ✓ By assembling different components, they will be able to produce small devices of their interest.

Detailed contents:

- 1. Machine shop (Lathe machine)
- 2. Fitting shop
- 3. Carpentry
- 4. House Wiring
- 5. Welding shop (Arc welding)
- 6. Tin Smithy

Suggested Text/ Reference Books:

- (i) Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
- (ii) Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition, 2002.
- (iii) Gowri P. Hariharan and A. Suresh Babu,"Manufacturing Technology I" Pearson Education, 2008.
- (iv) Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998.
- (v) Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

ENGINEERING MECHANICS

(Common to CE/ MECH)

B.Tech. I Year II Sem.

L T P C 3 1 0 4

Course Objectives:

The objectives of this course are to

- Explain the resolution of a system of forces, compute their resultant and solve problems using equations of equilibrium.
- Perform analysis of bodies lying on rough surfaces.
- Locate the centroid of a body and compute the area moment of inertia and mass moment of inertia of standard and composite sections.
- Explain kinetics and kinematics of particles, projectiles, curvilinear motion, centroidal motion and plane motion of rigid bodies.
- Explain the concepts of work-energy method and its applications to translation, rotation and plane motion and the concept of vibrations.

Course Outcomes:

At the end of the course, students will be able to

- Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.
- Solve problem of bodies subjected to friction.
- Find the location of centroid and calculate moment of inertia of a given section.
- Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotator motion and rigid body motion.
- Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.

UNIT-I:

Introduction to Engineering Mechanics - Force Systems :Basic concepts, Particle equilibrium in 2-D & 3-D; Rigid Body equilibrium; System of Forces, Coplanar Concurrent Forces, Components in Space – Resultant- Moment of Forces and its Application; Couples and Resultant of Force System, Equilibrium of System of Forces, Free body diagrams, Equations of Equilibrium of Coplanar Systems and Spatial Systems.

UNIT-II:

Friction: Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction; Motion of Bodies, wedge friction, screw jack & differential screw jack; Centroid and Centre of Gravity -Centroid of Lines, Areas and Volumes from first principle, centroid of composite sections; Centre of Gravity and its implications. – Theorem of Pappus.

UNIT-III:

Area moment of inertia- Definition, Moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections; Product of Inertia, Parallel Axis Theorem, Perpendicular Axis Theorem Mass Moment of Inertia : Moment of Inertia of Masses - Transfer Formula for Mass Moments of Inertia – Mass moment of inertia of composite bodies.

UNIT-IV:

Review of particle dynamics- Rectilinear motion; Plane curvilinear motion. Relative and constrained motion; Work-kinetic energy, power, potential energy. Impulse-momentum (linear, angular); Impact (Direct and oblique).

UNIT-V:

Kinetics of Rigid Bodies -Basic terms, general principles in dynamics; Types of motion, D'Alembert's principle and its applications in plane motion and connected bodies; Work Energy principle and its application in plane motion of connected bodies; Kinetics of rigid body rotation.

TEXT BOOKS:

1. Shames and Rao (2006), Engineering Mechanics, Pearson Education

2. Reddy Vijay Kumar K. and J. Suresh Kumar (2010), Singer's engineering Mechanics – Statics & Dynamics.

REFERENCE BOOKS:

- 1. Timoshenko S.P and Young D.H., "Engineering Mechanics", McGraw Hill International Edition, 1983.
- 2. Andrew Pytel, Jaan Kiusalaas, "Engineering Mechanics", Cengage Learning, 2014.
- 3. Beer F.P & Johnston E.R Jr. Vector, "Mechanics for Engineers", TMH, 2004.
- 4. Hibbeler R.C & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
- 5. Tayal A.K., "Engineering Mechanics Statics & Dynamics", Umesh Publications, 2011.
- 6. Basudeb Bhattacharyya, "Engineering Mechanics", Oxford University Press, 2008.
- Meriam. J. L., "Engineering Mechanics", Volume-II Dynamics, John Wiley & Sons, 2008.

COURSE STRUCTURE

II YEAR I SEMESTER COURSE STRUCTURE Subject Total Total Total P/D **Subject Name** L Т Credits Hours Marks Code 100 A13014 **Probability & Statistics** 3 1 0 3 4 Mathematical Foundations of Computer A13504 3 1 3 100 0 4 Science A13505 Data Structures 4 1 0 5 100 4 3 1 3 A13406 4 100 **Digital Logic Design** 0 4 A13506 **Object Oriented Programming** 4 1 0 5 100 3 3 A13401 **Electronic Devices & Circuits** 1 100 0 4 2 3 3 A13585 Data Structures Lab 0 0 75 Electronic Devices & Circuits and Digital 2 A13483 0 0 3 3 75 Logic Design Lab 2 MC-I 2 0 75 Mandatory Course-I 0 -Total 22 6 6 24 34 825

II YEAR II SEMESTER

COURSE STRUCTURE

Subject Code	Subject Name	L	т	P/D	Total Credits	Total Hours	Total Marks
A14507	Design and Analysis of Algorithms	4	1	0	4	5	100
A14508	Computer Organization	3	1	0	3	4	100
A14509	Database Management Systems	4	1	0	4	5	100
A14510	Software Engineering	3	1	0	3	4	100
A14511	Java Programming	4	1	0	4	5	100
A14016	Environmental Science	2	1	0	2	3	100
A14586	Java Programming Lab	0	0	3	2	3	75
A14587	Database Management Systems lab	0	0	3	2	3	75
MC-II	Mandatory Course-II	2	0	0	-	2	75
	Total	20	6	6	24	34	825

Note: All End Examinations (Theory and Practical) are of three hours duration.

L – Lecture

<u>II Year B.Tech. CSE/IT – I Sem</u>

PROBABILITY AND STATISTICS

(COMMON TO CSE, IT, ME& CE)

L T P/D C

3 1 0 3

Course Objectives:

- To revise elementary concepts and techniques of probability & statistics
- To extend and formalize knowledge of the theory of probability and random variables
- To introduce new techniques for carrying out probability calculations and identifying probability distributions
- To motivate the use of statistical inference in practical data analysis
- To study elementary concepts and techniques in statistical methodology
- To provide a introduction to subsequent statistics courses

Course Outcomes:

- Demonstrate an understanding of the basic concepts of probability and random variables.
- construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance
- Understand the concept of the sampling distribution of a statistic, and in particular describe the behavior of the sample mean.
- compute probabilities based on practical situations using the binomial and normal distributions
- use the normal distribution to test statistical hypotheses and to compute confidence intervals
- Application of Regression Analysis to analyze a problem

UNIT – I

Random Variables: Random variables – Discrete and continuous- Expectation- Properties, Moment Generating Function and Fitting of Binomial, Poisson & Normal distributions

UNIT – II

Testing of Hypothesis I: Sampling Distribution-Definition of Sample, Population and Types of Sampling. Estimation- Point estimation, Interval estimation, Testing of Hypothesis- Null hypothesis – Alternative hypothesis, Type I & Type II errors – critical region confidence interval for mean, testing of hypothesis for single mean and difference between the means for large samples.

UNIT – III

Testing of Hypothesis II: Confidence interval for the proportions, Tests of hypothesis for the proportions- single and difference between the proportions for large samples. Small Samples - t-distribution, F-Distribution, χ^2 distribution

UNIT –IV

Correlation and Regression: Coefficient of correlation – The Rank correlation, Regression Coefficients – Properties of regression coefficients, the two lines of regression, Multi Linear Regression.

UNIT –V

Quality Control: Control Charts-Control lines, determination of control limits, Types of Control Charts-Control Charts for variables (mean chart, Range chart)-charts for attributes (fraction defective, no. of defectives and defects for unit).

Time Series: Components of Time Series-Measurement of Trend

TEXT BOOKS:

- 1. Probability & Statistics by Dr. T.K.V.Iyengar, Dr.B.Krishna Gandhi et.al S.Chand Publications.
- 2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers.
- 3. Probability & Statistics for Engineers by Miller and John E Freund, Prentice Hall of India.
- 4. R.C.Gupta: Statistical Quality Control.
- 5. Fundamentals of Applied Statistics by S C Gupta ,Sultan Chand and Sons

REFERENCES:

- 1. Fundamentals of Mathematical Statistics by S.C. Gupta & V.K. Kapoor, S-Chand & Sons.
- 2. Srimanta Pal, Subodh C. Bhunia, (2015) ,Engineering Mathematics, 1st Edition, New Delhi, Oxford University Press
- 3. Probability, Statistics and Queueing Theory, 2nd Edition, Trivedi, John Wiley and sons
- 4. Probability and Statistics by E.Rukmangadachari , Pearson Education; First edition (2012)
- 5. Probability and Statistics for Engineering and the Sciences, 8th Edition, Jay L Devore, Cengage Learning.
- 6. Willam Feller: Introduction to Probability theory and its applications. Volume –I, Wiley
- 7. Statistical Quality Control, M.Mahajan, Dhanpat Rai & Sons.

<u>II Year B.Tech. CSE/IT – I Sem.</u> MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

L T P C 3 1 0 3

Course Objectives:

- 1. Define the syntax and semantics of propositional and predicate logic.
- 2. Translate statements from a natural language into its symbolic structures in logic.
- 3. Prove elementary properties of modular arithmetic and explain their applications in Computer Science, for example, in cryptography and hashing algorithms.
- 4. Apply the notion of relations on some finite structures, like strings and databases.
- 5. Analyze algorithms using the concept of functions and function complexity.
- 6. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

Course Outcomes:

- 1. To evaluate elementary mathematical arguments and identify fallacious reasoning (not just fallacious conclusions).
- 2. Solve discrete mathematics problems that involve: computing permutations and combinations of a set.
- 3. Analyze and deduce problems involving recurrence relations and generating functions.
- 4. Perform operations on discrete structures such as sets, functions, relations, and sequences.
- 5. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

UNIT -- I:

Foundations: Basics, Sets, Fundamentals of Logic, Logical Inferences, First order logic and other methods of Proof, Rules of Inference for Quantified Propositions.

UNIT – II:

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumerating Combinations and Permutations with & without repetitions, constrained repetitions.

UNIT -- III:

Recurrence Relations: Generating Functions, Calculating coefficient of Generating Function, Solving Recurrence relations by substitution method and Generating Functions, The Method of Characteristic Roots, Solutions to inhomogeneous recurrence relations.

UNIT -- IV:

Relations and Digraphs: Relations and Directed Graphs, Special Properties of Binary Relations, Equivalence Relations, Ordering Relations, Lattice, Paths and Closures, Directed Graphs and adjacency matrices, Topological Sorting.

UNIT -- V:

Graphs - Basic Concepts, Isomorphism and Sub-graphs, Trees and Their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

Text Books:

- 1. "Discrete Mathematics for Computer Scientists and Mathematicians" by Joe L. Mott, Abraham Kandel, Theodare P.Baker, Second Edition, PHI, 2009.
- 2. Discrete Mathematics R.K.Bisht, H.S.Dhami, OXFORD Higher Education.

Reference Books:

- 1. "Discrete Mathematics and its Applications", Kenneth H Rosen, Tata McGraw Hill Publishing Company Limited, New Delhi, Sixth Edition, 2007.
- 2. "Discrete Mathematical Structures with Applications to Computer Science", Tremblay J P and Manohar R, Tata McGraw Hill Publishing Company Limited, New Delhi, 2007.

<u>II Year B.Tech. CSE/IT – I Sem.</u>

DATA STRUCTURES

L TP C 4 10 4

Course Objectives:

- 1. Understand various static and dynamic representations of data structures.
- 2. Understand fundamental algorithmic problems of various nonlinear data structures.
- 3. To be familiar with Graph representations and traversals.
- 4. Know the basic concepts of Hashing.

Course Outcomes:

- 1. Analyze the representation of various static, dynamic and hierarchical data structures.
- 2. Design and implement the mechanism of stacks, general tree data structures with their applications.
- **3.** Implement various algorithms on graph data structures, including finding the minimum spanning tree , shortest path with real time applications etc.,
- **4.** Implementation of various advance concepts of binary trees and graphs with real time applications.
- 5. Outline the concepts of hashing, collision and its resolution methods using hash function

UNIT -- I:

Introduction: What is data structure, Types of data structures, Static and Dynamic representation of data structure and comparison. **Strings**: String definition, String built-in functions (strlen(),strcpy(),strcat(),strcmp(),strrev()), Strings and Pointers (Ch-3,T3), **Stacks**: Stacks definition, operations on stacks, Representation and evaluation of expressions using Infix, Prefix and Postfix, Algorithms for conversions and evaluations of expressions from infix to prefix and postfix using stack, Queues: Operations and types of Queues.

UNIT -- II:

Trees: Basic terminology, Types of trees: Binary Tree: terminology, Complete and Full Binary Tree, Extended Binary Trees, Threaded Binary Trees and In order Threading, Representation of Trees using Arrays and Linked lists (advantages and disadvantages). Tree Traversal and Representation of Algebraic expressions; Algorithms for Tree Traversals.

UNIT -- III:

Advanced concepts on trees: Representation and Creation of Binary Search Trees (BST), Algorithm for Inserting, deleting and searching in BST. Representation and advantages of AVL Trees, algorithms on AVL Trees-Insertion, Rotation and Deletion. M-way trees with examples, Definition and advantages of B-trees, B+ Trees, Red-Black Trees.

UNIT -- IV:

Graphs-Basic terminology, Representation of graphs: sequential representation (Adjacency, Path Matrix) Linked representation.

Graph Traversals-Breadth First Search, Depth First Search with algorithms. Definition and properties of Spanning Tree, Minimum Spanning Tree, Dijkstra Algorithms.

UNIT -- V:

Hashing: General Idea, Hash Functions, Separate Chaining ,Open Addressing-Linear probing, Quadratic Probing, Double Hashing, Rehashing, Extensible Hashing, Collisions in Hashing, Implementation of Dictionaries

Text Books:

- 1. Data Structures, Seymour Lipschutz, Schaum's Outlines, Tata McGraw-Hill, Special Second Edition.
- 2. Data Structures, A Pseudo code Approach with C, Richard F.Gillberg&Behrouz A. Forouzan, Cengage Learning, India Edition, Second Edition, 2005.
- 3. Data Structures Using C, Second Edition Reema Thereja OXFORD higher Education.

Reference Books:

- "Data Structures Using C and C++", Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein PHI Learning Private Limited, Delhi India.
- 2. "Fundamentals of Data Structures", Horowitz and Sahani, Galgotia Publications Pvt Ltd Delhi India.
- 3. Data Structure Using C, A.K. Sharma, Pearson Education India.

<u>II Year B.Tech. CSE/IT – I Sem.</u>

DIGITAL LOGIC DESIGN

L T P C 3 1 0 3

Course Objectives:

- 1. Understand the concepts of Binary system and conversions.
- 2. Be familiar with the concepts of logical functions using Boolean algebra
- 3. Learn various combinational circuits.
- 4. Understand the functionality of flip flops and design of sequential circuits.
- 5. Know the concepts of basic memory system.

Course Outcomes:

- 1. Understand various number systems, conversions, range and error detecting and correcting codes and their significance.
- 2. Evaluate the minimization of logic gates using Boolean algebraic principles and k-maps.
- 3. Design various simple and complex combinational circuits with real time applications.
- 4. Analyze the basic principles behind Flip flops & the design of sequential circuits with real time applications.
- 5. Illustrate various types of memory devices and their design.

UNIT -- I:

Number Systems: Binary, Octal, Hexa Decimal, and Conversions, range; Binary additions and subtractions (using 1c and 2c), concept of overflow; representations of negative numbers using 1's and 2's complement and range; **BCD numbers:** Representation of 8421, 2421, Ex-3, Gray and self complementary codes; additions and subtractions on 8421 codes; **Error detecting codes:** even, odd parity, hamming codes; **Error correcting codes:** hamming codes, block parity codes; Floating point representation.

UNIT --II:

Boolean Algebra and Digital Logic GATES, Basic Boolean laws and properties;Booleanfunctions;canonical and standard forms (SOP, POS); Gate minimization using three and four variable K-Map's with and without don't cares. Encoders, Decoders, Multiplexers, D-Multiplexers;

UNIT -- III:

Definition of combinational circuits, design procedure for half, full, decimal (8421) adders and subtractors; Combinational Circuit Design for BCD code converters.

UNIT -- IV:

Sequential circuits, latches, Flip Flops; Analysis of clocked sequential circuits, State Reduction and Assignment, Register, Ripple Counters, Synchronous Counters, Other Counters.

UNIT -- V:

Types of Memory – Main memory – Random Access Memory, ROM, Types of ROM; Decoder and RAM interface: Address lines, data lines, chip select signal; Design of large memories using small memories, using decoders; problems in memory design; Cache Memory- design issues, hit and miss ratio related problems; Associative and Auxiliary memory.

Text Books:

- 1. M. Morris Mano, Digital Design, Third Edition, Pearson Education/PHI, 2001.
- 2. Roth, Fundamentals of Logic Design, Fifth Edition, Thomson, 2004.

Reference Books:

- John F. Wakerly, Digital Design: Principles and Practices, 4th Edition, Pearson / Prentice Hall, 2005.
- 2. Malvino & Leach, Digital Principles and Applications, 7th Edition, Tata McGraw-Hill Edu., 2010.
- 3. A.K. Maini, Digital Electronics, Principles and Integrated Circuits, 1st Ed, Wiley India Publ., 2007.
- 4. M. Morris Mano and Michael D. Ciletti, Digital Design, 5th Edition, Pearson Education, 2012.

<u>II Year B.Tech. CSE/IT – I Sem.</u>

OBJECT ORIENTED PROGRAMMING

L T P C 4 1 0 4

Course Objectives:

Understand the C++ program structure and also the basics of C++ Programming language.
Use input and output formatted stream classes and the file streams and file modes to access the files.

3. Know the template classes and functions and Runtime error and how to handle that error.

Course Outcomes:

1. Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism.

2. Develop the applications using object oriented programming with C++.

3. Implement the concept of inheritance and polymorphism.

4. Apply I/O streams and files to develop programs for real time problems.

5. Apply advance features like templates and exception handling to make programs supporting reusability and sophistication

UNIT -- I:

Concepts of OOP: Introduction to OOP, Procedural versus Object Oriented Programming, Principles, Benefits and applications of OOP.

C++ Basics: Overview, Program structure, namespace, identifiers, variables, constants, enumerations, operators, typecasting, control structures.

UNIT -- II:

C++ Functions: Simple functions Call and Return by reference, Inline functions, Overloading of functions, default arguments, friend functions.

Objects and classes: Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading.

UNIT -- III:

Inheritance: Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.

Polymorphism: Pointers in C++, Pointers and Objects, this pointer, virtual and pure virtual functions, implementing polymorphism.

UNIT -- IV:

I/O Streams: Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators.

File management: File stream, C++ File stream classes, File management functions, File modes, sequential and random access files.

UNIT -- V:

Templates: Function and class templates, overloading of template functions.

Exceptions: Basics of exception handling, exception handling mechanisms, throwing, catching mechanisms, rethrowing an exception.

Text Books:

- 1. The Complete Reference C++, Herbert Schlitz, TATA McGraw Hill, Fourth Edition, 2003.
- 2. Object Oriented Programming in C++, SauravSahay, Oxford University Press, Second Edition, 2012.
- 3. Object Oriented Programming with C++, Reema Thereja OXFORD higher Education.

Reference Books:

- 1. Object Oriented Programming with C++, E Balagurusamy, TATA McGraw Hill, Sixth Edition, 2013.
- 2. C++ Programming, Black Book, Steven Holzner, dreamtech
- 3. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia
- 4. Object Oriented Programming with ANSI and Turbo C++, Ashok Kamthane, Pearson

<u>II Year B.Tech. CSE/IT I-Sem.</u> ELECTRONIC DEVICES AND CIRCUITS

L T P C 3 1 0 3

Course Objectives:

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

- 1. To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT and FET transistors and amplifier circuits.
- 2. To understand diode as rectifier. To study basic principle of filter circuits and various types.

Course Outcomes:

- 1. Understand and analyze the different types of diodes, operation and its characteristics Design and analyze the DC bias circuitry of BJT and FET Design biasing circuits using diodes and transistors.
- 2. To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices.

UNIT -I: P-N Junction Diode:

Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

Special Purpose Electronic Devices: Principle of Operation and Characteristics of Tunnel Diode (with the help of Energy Band Diagram), Varactor Diode, SCR and Semiconductor Photo Diode, UJT and Characteristics.

UNIT-II: Rectifiers and Filters:

The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters, π - Section Filters, Comparison of Filters, Voltage Regulation using Zener Diode.

UNIT-III: Bipolar Junction Transistor:

The Junction Transistor, BJT Symbol, Transistor Current Components, Transistor Construction, BJT Operation, Common Base, Common Emitter and Common Collector Configurations, Comparison of CB, CE, and CC Amplifier Configurations, Transistor as an Amplifier, Limits of Operation, BJT Specifications. **BJT Small Signal Model:** BJT Hybrid model, Determination of h-parameters from Transistor Characteristics, Analysis of a Transistor Amplifier Circuit using h- Parameters.

UNIT-IV: Transistor Biasing and Stabilization:

Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{be} and β , Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability,

UNIT-V: Field Effect Transistor and Biasing:

Field Effect Transistor: The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, FET as Voltage Variable Resistor, The JFET Small Signal Model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes. Biasing FET, Comparison of BJT and FET.

TEXT BOOKS:

- 1. Millman's Electronic Devices and Circuits J. Millman, C.C.Halkias, and Satyabrata Jit, 2 Ed., 1998, TMH.
- 2. Electronic Devices and Circuits Mohammad Rashid, Cengage Learning, 2013
- 3. Electronic Devices and Circuits David A. Bell, 5 Ed, Oxford.

REFERENCES:

- 1. Integrated Electronics J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
- 2. Electronic Devices and Circuits R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.
- 3. Electronic Devices and Circuits B. P. Singh, Rekha Singh, Pearson, 2Ed, 2013.
- 4. Electronic Devices and Circuits K. Lal Kishore, 2 Ed., 2005, BSP.
- 5. Electronic Devices and Circuits Anil K. Maini, Varsha Agarwal, 1 Ed., 2009, Wiley India Pvt. Ltd.
- 6. Electronic Devices and Circuits S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.

<u>II Year B.Tech. CSE/IT – I Sem.</u>

DATA STRUCTURES LAB

L T P C 0 0 3 2

Course Outcomes:

- 1. Develop the programs on stacks and its applications.
- 2. Demonstrate the operations on trees.
- 3. Demonstrate the implementation of various advanced trees.
- 4. Design and implementation of programs on BST and Graph Traversals.

Part-A

- 1. Program to illustrate string built in functions
- 2. Program to evaluate postfix notations
- 3. Program to convert infix to postfix notation
- 4. Program to illustrate tree traversals
 - a) In order b) Pre order c) Post order
- 5. Program to illustrate insertion, deletion and searching in Binary Search Tree.
- 6. Program to illustrate Graph traversals
 - a) Breadth First Search
 - b) Depth First Search
- 7. Program to illustrate Insertion, deletion and Rotation on AVL Trees.

Part-B

- 1. Program to illustrate Function Overloading to calculate area of a circle, rectangle and square
- 2. Program to illustrate virtual function
- 3. Program to illustrate default constructor, parameterized constructor and copy constructors
- 4. Program to illustrate single Inheritance, multiple inheritance, multilevel inheritance, hybrid inheritance
- 5. Program to illustrate run time polymorphism, compile time polymorphism
- 6. Program to illustrate Operator Overloading

a)Unary Operator b) Binary Operator

- 7. Program to illustrate Exception Handling Mechanisms using try, catch, throw keywords
- 8. Program to illustrate formatted and unformatted I/O streams

<u>II Year B.Tech. CSE/IT – I Sem</u>

Electronic Devices & Circuits and Digital Logic Design Lab

L T P/D C 0 0 3 2

PART A:

List of Experiments (EDC)

- 1. Forward & Reverse Bias Characteristics of PN Junction Diode.
- 2. Zener diode characteristics and Zener as voltage Regulator.
- 3. Half Wave Rectifier with & without filters.
- 4. Full Wave Rectifier with & without filters.
- 5. Input & Output Characteristics of Transistor in CB Configuration and h-parameter calculations.
- 6. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
- 7. FET characteristics.
- 8. UJT Characteristics

PART B:

List of Experiments (DLD)

- 1. Verify the functionality of logic gates & Flip-flops
- 2. Verification of De-Morgan's laws
- 3. Implementation and verification of full adder and full subtractor using logic gates.
- 4. Implementation and verification of 4X1 multiplexer & Demultiplexer using logic gates.
- 5. Implementation and verification of 2X4 Decoder and 1X4 De-multiplexer using logic gates.
- 6. Implementation of given function and verification using IC 74LS151 (8X1 multiplexer).
- 7. To design and verify the 4-bit ripple counter & decade counter
- 8. Verify the functionality of 4-bit magnitude comparator using IC 74LS85.
- 9. Verify the functionality of Universal Shift Register IC 74LS194/195

Note: Minimum 6 experiments from each part.

II Year B.Tech. CSE/IT - II Sem

DESIGN AND ANALYSIS OF ALGORITHMS

L T P C 4 1 0 4

Course Objectives:

- 1. Understand the asymptotic performance of algorithms.
- 2. Be familiar with graph algorithms and dynamic programming.
- 3. Understand the concept of back tracking, branch and bound.
- 4. Introducing the concept of NP-complete problems and different techniques to deal With them.
- 5. To understand the concepts of divide and conquer and greedy approaches.

Course Outcomes:

- 1. Acquire the knowledge of algorithm analysis and its notations that are applied on the problems solved by divide and conquer paradigm.
- 2. Apply the major graph algorithms for model engineering problems and knowledge of the greedy paradigm
- 3. Apply the dynamic-programming paradigm and recite algorithms that employ this paradigm.
- 4. Apply the concept of back tracking, branch and bound paradigm for real time problems.
- 5. Analyze the complexity of problems and differentiate that in terms of P and NP problems with examples.

UNIT I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Disjoint Sets- disjoint set operations, union and find operations.

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Stassen's matrix multiplication.

UNIT II

Graphs: Breadth First Search, Depth First Search, spanning trees, connected and biconnected components

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT III

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT IV:

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT V

Lower Bound Theory: Comparison Trees, NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Clique Decision Problem (CDP), Node cover decision problem.

Text Books:

- 1. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekharam, Galgotia publications pvt. Ltd.
- 2. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

References:

- 1. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, McGraw Hill.
- 2. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.

<u>II Year B.Tech. CSE/IT –II Sem</u>

COMPUTER ORGANIZATION

L T P C 3 1 0 3

Course Objectives:

- 1. Understand instruction format, life cycle and CPU Architecture and Organization
- 2. Know the basic Architecture of Microprocessor.
- 3. Understand different types of I/O interfaces.
- 4. Familiar with the concepts of pipelining techniques.
- 5. Understand the Multiprocessor concepts

Course Outcomes:

- 1. Understand the basic organization of computer and different instruction formats and addressing modes.
- 2. Analyze the concept of pipelining, segment registers and pin diagram of CPU.
- 3. Write simple programmes on assembly language.
- 4. Evaluate various modes of data transfer between CPU and I/O devices.
- 5. Examine various inter connection structures of multi processors.

UNIT -- I:

Instruction: Instruction Definition, instruction cycle, instruction storage, types of instruction formats (Zero, one, two and three address).

Addressing modes: mode field, implied, immediate register, register direct, register indirect, auto increment, decrement, indexed, relative, base address mode, Numerical examples and problems.

UNIT -- II:

CPU-Organization: 8086 – CPU – Block diagram and pin diagram, concept of pipelining, minimum and maximum mode, segment register and generation of 20 bits address, concept of address, data, control and systems bus, Types of flags.

UNIT -- III:

CPU and Main Memory interface, programming the basic computer – Machine Assembly Languages. **Assembler:** basic assembly language instructions (ADD, SUB, LOAD, STORE, MOV, CMP, JUMP). **Micro-programmed control:** control memory, address sequencing, micro program example and design of control unit.

UNIT -- IV:

I/O interface: I/O Bus and Interface modules, I/O versus Memory Bus. Modes of Transfer: Example of programmed I/O, interrupt-initiated I/O, software considerations. Daisy- Chaining priority. DMA: DMA Controller, DMA Transfer, Intel 8089 IOP.

UNIT -- V:

Multi Processors: Characteristics of Multi Processor; Interconnection structures: Time shared common bus, multiport memory, crossbar switch, multi-stage switching network; Introduction to Flynn's classification: SISD, SIMD, MISD, MIMD (Introduction).

Text Books:

- 1. Computer System Architecture M. Morris Mano, Third Edition, Pearson/PHI, 2011.
- 2. Microprocessor and Interfacing Douglas V Hall, Second Edition, TATA McGraw Hill, 2006.

Reference Books:

- 1. Computer Organization Carl Hamacher, ZvonksVranesic, SafeaZaky, V Edition, McGraw Hill.
- 2. Computer Organization and Architecture William Stallings, 6th Edn. Pearson/ PHI.

DATABASE MANGEMENT SYSTEMS

<u>II Year B.Tech. CSE –II Sem</u>

LTPC

4 1 0 4

Course Objectives:

- 1. To provide a sound introduction to Database management systems, Databases and its applications,
- 2. To familiarize the participant to give a good formal foundation on the relational model of data
- 3. To present SQL and procedural interfaces to SQL comprehensively
- 4. To give an introduction to systematic database design approaches conceptual design, logical design, schema refinement and physical design
- 5. To introduce the concepts of transactions and transaction process and the issues and techniques relating to concurrency and recovery manager.

Course Outcomes:

- 1. Design Entity-Relationship Model for enterprise level databases.
- 2. Develop the database and provide restricted access to different users of database and formulate the Complex SQL queries.
- 3. Analyze various Relational Formal Query Languages and various Normal forms to carry out Schema refinement
- 4. Use of suitable Indices and Hashing mechanisms for real time implementation.
- 5. Ability to analyze various concurrency control protocols and working principles of recovery algorithms.

UNIT-I

Introduction to Database System Concepts: Database-System Applications, Purpose of Database Systems, View of Data, Database Language, Database Design, Database Architecture, Database Users and Administrators.

Introduction to the Relation Models and Database Design using ER Model: Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations, Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Features.

UNIT-II

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Integrity Constraints, SQL Data Types, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Sub Queries, Nested Sub queries, Modification of the Database.

Intermediate and Advanced SQL: Join Expressions, Views, Authorization, Advanced Aggregation Features, Cursers, Functions and Procedures, Triggers.

UNIT-III

Formal Relational Query Languages: The Relational Algebra, the Tuple Relational Calculus, the Domain Relational Calculus.

Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Decomposition Using Multi valued Dependencies, More Normal Forms.

UNIT-IV

Indexing and Hashing: Basic Concepts, Ordered Indices, B+-Tree Index Files, B+-Tree Extensions, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.

Transactions: Transaction Concept, a Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels.

UNIT-V

Concurrency Control: Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols, Multi version schemes.

Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES, Remote Backup Systems.

Text Books:

- 1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", 6th Edition, Tata McGraw-Hill.
- Raghu Rama Kirshna, Johannes Gehrk, "Database Management System" Tata McGraw Hill 3rd Edition.

Reference Books:

- 1. Peter Rob & Carlos Coronel "Database System Concepts" Cengage Learning.
- 2. RamezElmasri, Shamkanth B. Navrate"Fundamentals of Database Systems "7th Edition, Pearson Education.
- 3. C.J. Date "Introduction to Database Systems" Pearson Education

II Year B.Tech. CSE/IT –II Sem

SOFTWARE ENGINEERING

L T P C 3 1 0 3

Course Objectives:

- 1. Understand the framework activities for a given project.
- 2. Choose a process model to apply for given project requirements.
- 3. Design various system models for a given scenario.
- 4. Design and apply various testing techniques.
- 5. Understand metrics for Process and Products.

Course Outcomes:

- 1. Choose a process model to apply for given project requirements.
- 2. Analyze and apply the framework activities for a given project.
- 3. Design various system models for a given scenario.
- 4. Design and apply various testing techniques.
- 5. Understand metrics for Process and Products.

UNIT I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), personal and team process models.

UNIT II:

Process models: The waterfall model, Incremental process models, Evolutionary process model, agile process. Software Requirements: Functional and non-functional requirements, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management

UNIT III:

System models: Context Models, Behavioral models, Data models, Object models, structured methods. Design Engineering: Design process and Design quality, Design concepts, the design model, Modeling component level design: design class based components, conducting component level design. Performing User interface design: Golden rules.

UNIT IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, Product metrics : Software Quality, Metrics for Analysis Model- function based metrics, Metrics for Design Model-object oriented metrics, class oriented metrics, component design metrics, Metrics for source code, Metrics for maintenance.

UNIT V:

Metrics for Process and Products: Metrics for software quality. Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan. Quality Management: Quality concepts, Software Reviews, Formal technical reviews, Software reliability, The ISO 9000 quality standards.

Text Books:

- 1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGraw Hill International Edition.
- 2. Software Engineering- Sommerville, 7th edition, Pearson education.

References:

- 1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
- 2. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, JohnWiely.
- 3. Systems Analysis and Design- ShelyCashmanRosenblatt, Thomson Publications.
- 4. Software Engineering principles and practice- Waman S Jawadekar, the McGraw-Hill Companies.

II Year B.Tech. CSE –II Sem

JAVA PROGRAMMING

L T P C 4 1 0 4

Course Objectives:

- 1. Understand the concept of OOP and learn the basic syntax and semantics of the Java language and programming environment.
- 2. Be familiar with the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
- 3. Understand Exceptional handling and multithreading concepts.
- 4. Be familiar with GUI applications.

Course Outcomes:

- 1. Design, write and test a java program to implement a working understand the fundamental concepts of the object oriented paradigm and their implementation in the Java programming language.
- 2. Write code to define classes and interfaces that uses class libraries such as java.lang, java.util, java.io. Use exception handling and multithreading in programs.
- 3. Develop GUI applications.
- 4. Give object oriented solutions for the complex and real world problems.

UNIT -- I:

Fundamentals of Object Oriented Programming: Object-Oriented Paradigm, Basic Concepts of Object Oriented Programming- Objects and Classes, Data abstraction and encapsulation, inheritance, Polymorphism, Data binding, Message Communication, Benefits of OOP, Applications of OOP. Java Basics History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, Strings.

UNIT -- II:

Inheritance – Base class object, subclass, subtype, substitutability, forms of inheritancespecialization, specification, construction, extension, limitation, combination, Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes, Object class.

Packages and Interfaces : Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, File, Byte Streams, Character Streams, Stream I/O.

UNIT -- III: Exception handling - Concepts of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Package java.util, The Collection Interface, list interface, Queue interface, The Collection class: LinkedList Class, HashSet Class. Tree Set Class, StringTokenizer, Date, Random, Scanner.

Multi threading: Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication.

UNIT -- IV:

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

AWT: class hierarchy, component, container, panel, window, frame, canvas, graphics, Layout Manager – layout manager types – boarder, grid, flow, card and grib bag.

UNIT -- V:

AWT controls: Labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar.

Applets – Concepts of Applets, differences between applets and applications, life cycle of an apple, create applets, passing parameters to applets.

JDBC Connectivity: JDBC Type 1 to 4 Drivers, connection establishment, Query Execution.

Text Books:

- 1. Java- the complete reference, Seventh edition, Herbert Schildt, Tata McGraw Hill.
- 2. Database Programming with JDBC&JAVA, Second Edition, George Reese, O'Reilly Media.
- 3. Programming in JAVA Second Edition, OXFORD Higher Education.

Reference Books:

- 1. Thinking in Java Fourth Edition, Bruce Eckel
- 2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
- 3. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

II Year B.Tech. CSE/IT –II Sem. ENVIRONMENTAL SCIENCE Common to all Branches

Course Objectives:

L T P C 2 1 0 2

- Develop an understanding on the importance of environmental protection.
- Understanding the significance of ecological balance for sustainable development.
- The ability to apply quantitative reasoning and practical skills to environmental problems.

Course Outcomes:

- To enable the students to realize the importance of the sustainable use of natural resources.
- To make the students aware of the impacts of human actions on environment and measures to minimize and mitigate them.
- To enable the students to become aware of the current issues and problems pertaining to the environment.

UNIT I:

Ecosystems:

Definition, Scope and Importance of ecosystem; Classification of ecosystems, Structure and Functions of ecosystem: Food chains, Food Web and Ecological Pyramids, Flow of energy; Bioaccumulation and Biomagnifications; Ecosystem Value services and Carrying Capacity. **BIODIVERSITY AND BIOTIC RESOURCES**: Introduction, Definition, levels of Biodiversity, Value of biodiversity, Hot spots of biodiversity, Threats to biodiversity, conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT II:

Natural Resources: Classification of Resources, **Water resources**: use and over utilization of surface and ground water, Floods and Droughts, Dams: benefits and problems. **Energy resources**: growing energy needs, Renewable Energy Sources – Solar, Hydro-Power, Wind, Tidal, Geo-Thermal, Biomass, Bio-fuels, Hydrogen as a fuel and Biogas and Non Renewable Energy – Coal, Petroleum, LPG, Natural Gas, SNG, CNG. **Land resources**: land as a resource, land degradation – Landslide and Soil Erosion; **Forest Resources – Uses and Exploitation**.

UNIT III:

Environmental Pollution and Control: Types of Pollution, Sources, Effects and Control measures and Quality Standards for

- 1. Air Pollution
- 2. Water Pollution
- 3. Soil Pollution
- 4. Noise Pollution

Solid, Hazardous, Biomedical and e-Waste Management and Handling Rules, Nuclear Hazards – Case Studies. **Waste water treatment methods**: Effluent treatment plants (ETP), Sewage treatment plants (STP), Common and combined effluent treatment plants (CETP).

UNIT IV:

Global Environmental Problems And Global Efforts: Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate change and their impacts on human environment; Ozone depletion and Ozone depleting substances (ODS); Aid Rains, Deforestation and Desertification.

Environmental Impact Assessment (EIA): Definition of Impact: classification of impacts, Methods

of baseline data acquisition. Impacts on different environmental components; Environmental Impact Statement (EIS). Environmental Management Plan (EMP) - Rain Water Harvesting, Water Shed Management and Bioremediation.

UNIT V:

Environmental Policy, Legislation, Rules And Regulations: Environmental Protection act, Legal aspects Air (Prevention and Control of pollution) Act- 1981, Water (Prevention and Control of pollution) Act-1974, Forest Conservation Act, Wildlife Act 1972. **Towards Sustainable Future**: Concept of Sustainable Development, Threats to Sustainability: Population and its explosion, Crazy Consumerism, Over-exploitation of resources; Environmental Education, Role of Civil Societies, Role of IT in Environment, Smart Cities, Concept of Green Building, Low Carbon Lifestyle, Life cycle assessment and Ecological Foot Print.

TEXT BOOKS:

- 1. Text Book of Environmental Studies by Anubha Kaushik (4th Edition), New age International Publishers.
- 2. Environmental studies by Erach Bharucha 2005, University Grants Commission, University Press.
- 3. Environmental studies, From crisis to cure by R.Rajagopalan, 2005

REFERENCE BOOKS:

- 1. Environmental Science: Towards a Sustainable Future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
- 2. Environmental Science by Daniel B. Botkin & Edward A. Keller, Willey INDIA Edition.
- 3. Text book of Environmental Science and Technology by M.Anji Reddy 2007

II Year B.Tech. CSE-II Sem.

JAVA PROGRAMMING LAB

L T P C 0 0 3 2

Course Outcomes:

- 1. Familiarize with Java Environment and use of Java Development Kit for the creation and execution of java programs
- 2. Develop programs on various concepts like data abstraction & data hiding, encapsulation, inheritance, polymorphism.
- 3. Create and use threads, handle exceptions and write applets.
- 4. Develop the programs using interfaces, inner classes, wrapper classes and generics.
- 5. Develop GUI applications.

Week 1:-

1) Write a program to find total, average of given two numbers by using function with default arguments, static data members and this keyword?

2) Write a program to illustrate class and objects (Banking operations)

Week 2:-

3) Write a program to illustrate constructors? (Inventory of Books)

4) Write a program to create a class complex with necessary operator overloading and type conversion such as integer to complex, complex to double.

Week 3:-

5)Write a program that randomly generates complex numbers and write two numbers per line in a file along with an operator(+,-,P,*,/). The numbers are written to file in the format (a+ib) 6) Write a program to read one line at a time, perform the corresponding operation on two complex numbers read, write the result to another file (one per line)

Week 4:-

7) Write a program to illustrate inheritance (Student Evaluation)

8) Write a java program to handle the situation of exception handling.

Week 5:-

9) Write a java program to demonstrate the concept of polymorphism.

10) Write a java program to illustrate Method Overriding?

Week 6:-

11) Write a java program to illustrate Method overloading of assignment operator?

12) Write a program to illustrate Array Manipulation?

Week 7:-

13) Write a program to illustrate Synchronization?

14) Write a program to StringTokenizer?

Week 8:-

15) Write a program to implement the concept of User defined Exceptions.

16) Write a program to illustrate the use of creation of packages.

Week 9:-

17) Write a program to illustrate Multithreading and Multitasking?

18) Write a program to illustrate thread priorities.

Week 10:-

19) Write a program to illustrate applet concept.

Week 11:-

20) Write a program to illustrate Event Handling (keyboard, Mouse events)

Week 12:-

21) Write a program to develop a calculator application using AWT.

Week 13:-

22) Write a program to illustrate JDBC.

<u>II Year B.Tech. CSE/IT –II Sem.</u> DATABASE MANAGEMENT SYSTEMS LAB

Course Outcomes:

L T P C 0 0 3 2

- 1. Use the SQL commands such as DDL, DML, DCL, TCL to create, manipulate, access data from database objects and providing authorization to access database by different users.
- 2. To apply various integrity Constraints on the database tables for preserving the integrity of the database.
- 3. Design and implement PI/SQL programs which include procedures, functions, cursor and triggers.

1. Database Schema for a customer-sale scenario

Customer (**Cust id: integer**, cust_name: string)

Item (item_id: integer, item_name: string, price: integer)

Sale (<u>bill_no: integer</u>, bill_data: date, cust_id: integer, item_id: integer, qty_sold: integer) For the above schema, perform the following—

- a) Create the tables with the appropriate integrity constraints
- b) Insert around 10 records in each of the tables
- c) List all the bills for the current date with the customer names and item numbers
- d) List the total Bill details with the quantity sold, price of the item and the final amount
- e) List the details of the customer who have bought a product which has a price>200
- f) Give a count of how many products have been bought by each customer
- g) Give a list of products bought by a customer having cust_id as 5
- h) List the item details which are sold as of today
- i) Create a view which lists out the bill_no, bill_date, cust_id, item_id, price, qty_sold, amount

Create a view which lists the daily sales date wise for the last one week

2. Database Schema for a Student Library scenario

Student(<u>Stud_no:integer</u>,Stud_name: string) Membership(<u>Mem_no:integer</u>,Stud_no: integer) Book(<u>book_no: integer</u>, book_name:string, author: string)

lss_rec(iss_no:integer, iss_date: date, Mem_no: integer, book_no: integer)

For the above schema, perform the following

- a) Create the tables with the appropriate integrity constraints
- b) Insert around 10 records in each of the tables
- c) List all the student names with their membership numbers
- d) List all the issues for the current date with student and Book names
- e) List the details of students who borrowed book whose author is CJDATE
- f) Give a count of how many books have been bought by each student
- g) Give a list of books taken by student with stud_no as 5
- h) List the book details which are issued as of today
- i) Create a view which lists out the iss_no, iss _date, stud_name, book name
- i) Create a view which lists the daily issues-date wise for the last one week

3. Database Schema for a Employee-pay scenario

Employee (<u>emp_id : integer, emp_name: string</u>) department (<u>dept_id:</u> <u>integer</u>,dept_name:string)

Paydetails (**emp_id: integer, dept_id: integer**, basic: integer, deductions: integer, additions: integer, DOJ: date) payroll <u>(emp_id: integer</u>, pay_date: date)

For the above schema, perform the following

- a) Create the tables with the appropriate integrity constraints
- b) Insert around 10 records in each of the tables
- c) List the employee details department wise

- d) List all the employee names who joined after particular date
- e) List the details of employees whose basic salary is between 10,000 and 20,000
- f) Give a count of how many employees are working in each department
- g) Give a names of the employees whose netsalary>10,000
- h) List the details for an employee_id=5
- i) Create a view which lists out the emp_name, department, basic, dedeuctions, netsalary
- j) Create a view which lists the emp_name and his netsalary

4. Database Schema for a Video Library scenario

Customer (cust_no: integer,cust_name: string) Membership (<u>Mem_no: integer</u>, cust_no: integer) Cassette (<u>cass_no:integer</u>, cass_name:string, Language: String) Iss_rec(iss_no: integer, iss_date: date, mem_no: integer, cass_no: integer)

For the above schema, perform the following

- a) Create the tables with the appropriate integrity constraints
- b) Insert around 10 records in each of the tables
- c) List all the customer names with their membership numbers
- d) List all the issues for the current date with the customer names and cassette names
- e) List the details of the customer who has borrowed the cassette whose title is "The Legend"
- f) Give a count of how many cassettes have been borrowed by each customer
- g) Give a list of book which has been taken by the student with mem_no as 5
- h) List the cassettes issues for today
- i) Create a view which lists outs the iss_no, iss_date, cust_name, cass_name
- j) Create a view which lists issues-date wise for the last one week

5. Database Schema for a student-Lab scenario

Student(stud_no: integer, stud_name: string, class: string) Class(class: string, descrip: string)

Lab(<u>mach_no: integer</u>, Lab_no: integer, description: String)

Allotment(Stud_no: Integer, mach_no: integer, dayof week: string)

For the above schema, perform the following

- a) List all the machine allotments with the student names, lab and machine numbers
- b) List the total number of lab allotments day wise
- c) Give a count of how many machines have been allocated to the 'CSE' class
- d) Give a machine allotment details of the stud_no 5 with his personal and class details
- e) Count for how many machines have been allocated in Lab_no 1 for the day of the week as "Monday"
- f) How many students class wise have allocated machines in the labs
- g) Create a view which lists out the stud_no, stud_name, mach_no, lab_no, dayofweek
- h) Create a view which lists the machine allotment details for "Thursday".
- 6. Create a cursor, which displays all employee numbers and names from the EMP table.
- 7. Create a cursor, which update the salaries of all employees as per the given data.
- 8. Create a cursor, which displays names of employees having salary > 50000.
- 9. Create a procedure to find reverse of a given number
- 10. Create a procedure to update the salaries of all employees as per the given data
- 11. Create a procedure to demonstrate IN, OUT and INOUT parameters
- 12. Create a function to check whether given string is palindrome or not.
- 13. Create a function to find sum of salaries of all employees working in depart number 10.
- 14. Create a trigger before/after update on employee table for each row/statement.
- 15. Create a trigger before/after delete on employee table for each row/statement.
- 16. Create a trigger before/after insert on employee table for each row/statement.

INTELLECTUAL PROPERTY RIGHTS AND CYBER LAWS

Course Objectives:

L T P/D C 2 0 0 0

- 1. To make students familiar with Intellectual Property Rights.
- 2. To understand innovations in engineering and other domains.
- 3. To be familiar with patents, copyrights and various acts related to innovations.

Course Outcomes:

- 1. To define various terms related to Intellectual Property Rights.
- 2. To understand the process of patent, copyrights and related procedures.
- 3. To analyze the situation of IPR in the Indian context with that of global scenario.
- 4. To understand the patenting process through various case studies.

UNIT - I:

Introduction to Intellectual property Rights (IPR):

Introduction, Types of Intellectual Property Rights, International Organizations, Agencies and Treaties, Importance of Intellectual Property Rights.

UNIT - II:

Trade Marks:

Purpose And Function Of Trademarks, Acquisition Of Trade Mark Rights, Protectable Matter, Selecting And Evaluating Trade Mark, Trade Mark Registration Processes.

UNIT - III:

Copy rights Law:

Fundamental Of Copy Right Law, Originality Of Material, Rights Of Reproduction, Rights To Perform The Work Publicly, Copy Right Ownership Issues, Copy Right Registration, Notice Of Copy Right, International Copy Right Law.

Patents Law:

Foundation of Patent Law, Patent Searching Process, Ownership Rights And Transfer

UNIT - IV:

Trade Secrets:

Trade Secrete Law, Determination Of Trade Secrets Status, Liability For Misappropriations Of Trade Secrets, Protection For Submission, Trade Secret Litigation.

Unfair competition: Misappropriation Right Of Publicity, False Advertising.

UNIT - V:

Cyber Law:

Cyber Crime, Information Security, Cyber Criminals, Classification Of Cyber Criminals- Legal Perspectives- Indian Perspectives- Cyber Crimes And Indian ITA 2000, Global Perspective On Cyber Crime- Cyber Crime Era.

TEXT BOOKS & REFERENCES:

- 1. Deborah, E. Bo Choux, Intellectual Property Right, Cengage Learning
- 2. Prabuddha Ganguli, Intellectual Property Right Unleashing The Knowledge Economy, Tata Mc Graw Hill Publishing Company Ltd.,
- 3. Nina Godbole and Sunitha Belapure, "Cyber Security" Wiley India 2012.

PROFESSIONAL ETHICS, HUMAN VALUES AND SELF DEVELOPMENT

Course Objectives:

L T P/D C 2 0 0 0

- a. To offer the students an appropriate set of values to live by
- b. To help them achieve a balanced life with appropriate attitudes and behaviour
- c. To ensure harmonious life with sustained happiness and prosperity
- d. To create awareness on Ethical human conduct, Engineering Ethics, Social responsibility as an engineer.

Course Outcomes:

- 1. Cultivate the habit of Introspection; Inspirations from within and outside and journal writing to become Successful Engineers with hopes of a better human being.
- 2. Ethical Responsibilities of Engineers while dealing with the issues.
- 3. To maintain work life -balance and societal well being.
- 4. Develop Right thinking and understanding

UNIT – I

Course Introduction to Values: Need, Guidelines, Content and Educational Process, Application of values, Universal values. Natural Acceptance. Self Exploration – Meditation- self exploration. Continuous Happiness and Prosperity - Right thinking and understanding. Ambition and Aspiration.

UNIT - II:

Harmony in the Human Being:

Harmony in Myself: Human being as a co-existence of 'l' and the material 'Body'. Needs of Self ('l') and 'Body'. The Body as an instrument of 'l' (I being the Doer, Seer and Enjoyer). Harmony of I with the Body, Correct Appraisal of Physical needs

UNIT - III:

Harmony in the Family, Society and in Nature:

Harmony in Human - Human Relationships: Harmony in the Family, Values in Human - Human Relationships, Trust, Respect and other Salient Values in Relationships. Harmony in the Society, Universal Harmony Order.

Harmony in the nature and Existence: Whole existence as Co-existence: Inter-connectedness and Mutual fulfillment among the four orders of nature - Recyclability and Self-regulation in nature.

UNIT - IV:

Professional Ethics:

Introduction, Profession, Professionals, Professionalism, Professional's- roles and risks, Professional Accountability, Ethics in Engineering Profession, Roles of Engineers, Balanced outlook on Law and Responsibilities as Citizens, Professional Responsibilities, Professional Rights.

UNIT - V:

Self Development:

Behavior and Attitude, Stress Management- Types of Stress, Self Management, Choices we make, Excellence.

Meditation: Importance of Meditation, Observation, Introspection, Contemplation, Concentration, Relaxation, Systematic Practice of Meditation.

Inner Cleaning, Need to purify our Conscience and develop Purity in Thoughts and Actions Journal Writing: Uses and Self Development.
TEXT BOOKS:

- 1. R. R. Gaur, R Sangal, g p Bagaria, 2009, A foundation course in human values and professional ethics.
- 2. Professional ethics by R Subramanian Oxford press
- 3. M Govindrajan, S Natrajan & V. S Senthil kumar, Engineering Ethics (including Humna Values), Eastern Economy Edition, Prentice Hall of India Ltd
- 4. Self development modules from heartfulness institute (content.heartfulness.org)
- 5. Prof. K Subba Raju 2013, Success secrets for engineering students, Smart student publication 3rd edition.

REFERENCE BOOKS:

- 1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
- 2. E. F. Schumancher, 1973, small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.
- 3. A Nagraj, 1998 Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
- 4. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1991.
- 5. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.
- 6. A. N. Tripathy, 2003, Human Values, New Age International Publishers.
- 7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
- 8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth - Club of Rome's report, Universe Books.
- 9. E G Seebauer & Robert L.Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.

PROFESSIONAL COMMUNICATION

L T P C 2 0 0 0

Introduction:

The world is in need of effective and efficient professionals. Technical students are to be equipped with Professional Communication skills to enable them to face the growing employment demands. The course has been introduced to bridge the gap between communication skills of ELCS and ACS.

Course Objectives:

To enable a student:

- speak & write intelligible English
- understand professional etiquette and learn appropriate mannerism
- learn about leadership, team building skills and to solve problems by taking decisions
- to present effectively
- knowing his/her strengths and overcoming weaknesses

Course Outcomes:

<u>A student learns:</u>

- to speak and write appropriate English
- > the professional demands
- to solve problems and take decisions
- requisite professional skills

Unit: I

Academic Vocabulary and Grammar

Exercises on: Correction of sentences Tenses, Articles, Prepositions, etc. Synonyms, Antonyms, One word substitutes, Idioms & Phrases

Unit: II

Self Appraisal

Self Introduction, SWOT Analysis, Goal setting Personality Development

Unit: III

Professional Etiquette

Etiquette Mannerism Positive Attitude Behavioral Traits

Unit: IV

Team Building

Leadership skills Team Work

Decision Making/ Problem Solving / Conflict managements Case Study

Unit: V

Presentation Skills

Poster Presentation Oral Presentation

References:

- 1) Rao, M.S. Soft Skills Enhancing Employability. New Delhi: I.K. Publishing House, 2010.
- 2) Rao, Nageshwar. Communication Skills. New Delhi: Himalaya Publishing House Pvt.Ltd, 2008
- 3) Ashrif Rizvi. Effective Technical Communication, Tata Mc Grahill, 2011.
- 4) Daniel G. Riordan & Steven E. Pauley. *Technical Report Writing Today*, Biztantra Publishers, 2005.
- 5) David A McCurry & Joanne Buckely, Handbook for Technical Writing CENGAGE Learning 2008.
- 6) Raymond Murphy's English Grammar with CD, Murphy, Cambridge University Press, 2012.
- 7) William Standard. Living English Structures- Allen-Pearson, 2011.
- 8) S M Guptha. Current English Grammar and Usage, PHI, 2013.
- 9) Krishna Swami. Modern English Grammar-, McMillan, 2009.
- 10) Anjana Agarwal. Powerful Vocabulary Builder, New Age International Publishers, 2011

DISASTER MANAGEMENT

L	Т	P/D	С
2	0	0	0

Course Objectives:

- To provide knowledge related to the broad field of environmental risk assessment.
- Steps involved in the risk assessment process, including statistical characterization of observed data.
- Knowledge about tools that can be used in defining environmental risks, particularly as related to human health.
- To develop practical skills in disaster mitigation, planning, response and post disaster rehabilitation, particularly related to health and public health.

Course Outcomes:

- Develop an understanding of the key concepts, definitions a key perspectives of all Hazards Emergency Management
- Understand the Emergency/Disaster Management Cycle
- Have a basic understanding for the history of Emergency Management
- Develop a basic under understanding of Prevention, Mitigation, Preparedness, Response and Recovery
- Develop a basic understanding for the role of public and private partnerships

UNIT-I

Introduction to the Different Types of Disasters:

Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, drought, cyclone, earthquakes, landslides, avalanches, Volcanic eruptions, Heat and cold waves, Climatic change: global warming, Sea level rise, ozone depletion.

Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, air pollution, water pollution, deforestation, industrial waste water pollution, road accidents, rail accidents, air accidents, sea accidents.

UNIT-II

Environment and Disasters:

Environment, ecosystem and disasters. Climate change – issues and concerns. Industrial hazards and safety measures. Post disaster impact on environment. Impact of developmental projects on disaster risk. Aspects of environmental management for disaster risk reduction. Environmental Impact Assessment (EIA).

UNIT-III

Disaster Risk Mitigation:

Disaster risk assessment (Hazard-Vulnerability-Capacity analysis), Hazard mapping and forecasting. Principles and aspects of Disaster prevention Disaster mitigation Preparedness for damage mitigation and coping with disasters. Capacity building for disaster/damage mitigation (structural and non-structural measures). Contingency planning for damage mitigation of different hazards.

UNIT-IV

Disaster Management:

Effect to migrate natural disaster at national and global levels. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community –based organizations and media. Central, state, district and local administration; Armed forces in disaster response; Disaster responses; Police and other organizations. (2009).

UNIT-V

Planning for Disaster Rescue and Risk Reduction:

Community-hazard profile of the disaster site. DM cycle, Different phases of Disaster Management: Predisaster stage, Emergency stage, Post disaster stage. Implementation of different disaster management phase and Relief mechanism during different disaster stages including cyclones, earthquakes, fire accidents, Tsunami, landslides etc. Disaster Management Act (2005); Disaster Management Policy (2009).

TEXT BOOKS:

- 1. Disaster Mitigation: Experiences and Reflections by Pradeep Sahni, (2013).
- 2. Natural Hazards & Disasters by Donald Hyndman & David Hyndman Cengage Learning (2009).

S. No.	Subject Code	Subject Name	L	T	Р	Total Credits
	B.Tech III YEAR I SEMESTER					
1	A15512	Linux Programming	3	1	0	3
2	A15513	Computer Networks	3	1	0	3
3	A15514	Operating Systems	3	1	0	3
4	A15515	Formal Languages & Automata Theory	3	1	0	3
5	Professional Elective-1	A15517-Principles of Programming Languages A15518 – Human Computer Interaction A15519 - Software Project Management	3	1	0	3
6	Open Elective-1	A15520 – Java Programming A15521 – Operating Systems	3	1	0	3
7	A15588	Operating Systems & Computer Networks lab through LINUX.	0	0	3	2
8	A15089	Advanced Communication Skills Lab	0	0	3	2
9	MC-III	Quantitative Methods & Logical Reasoning	2	1	0	2
		Total	20	7	6	24
B.Tech III YEAR II SEMESTER						
1	A16522	Web Technologies	3	1	0	3
2	A16523	Compiler Design	3	1	0	3
3	A16525	Data Warehousing & Data Mining	3	1	0	3
4	A16018	Managerial Economics & Financial Analysis	3	1	0	3
5	A16526 A16527 A16528	 Professional Elective-2 Object Oriented Analysis & Design Distributed Systems Information Retrieval Systems 	3	1	0	3
6	Open Elective-2	A16529 - A16530 -	3	1	0	3
7	A16589	Web Technologies & Case Tools Lab	0	0	3	2
8	A16590	Compiler Design & Data Mining Lab	0	0	3	2
9	MC-IV	Personality Development & Behavioural Skills	2	1	0	2
		Total	20	7	6	24

B.TECH CSE III YEAR COURSE STRUCTURE

LINUX PROGRAMMING

Course Objectives:

- To understand the Linux utilities, sed and awk concepts to solve problems.
- To implement in C some standard Linux utilities such as ls, mv, cp etc. using system calls.
- To understand process concepts and Interprocess communication in Linux.

Course Outcomes:

- To understand and make effective use of Linux utilities and Shell scripting language (bash) to solve problems.
- To develop the skills necessary for systems programming including file system programming, process and signal management.
- To apply basic skills of inter process communication
- To develop the basic skills required to write network programs using Sockets

UNIT - I:

Linux Utilities: File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities. Sed-Scripts, Operation, Addresses, Commands, Applications, awk-Execution, Fields and Records, scripts, operations, patterns, actions, functions, using system commands in awk.

UNIT - II:

Shell programming with Bourne again shell(bash): Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing functions, debugging shell scripts.

UNIT - III:

Files : File Concept, File types, File System Structure, Inodes, File Attributes, Library Functions, kernel support for files, system calls for file I/O operations- open, create, read, write, close.

Directories: Creating, removing and changing Directories -mkdir, rmdir, chdir, obtaining current working directory. Scanning Directories-opendir, readdir, closedir, rewinddir functions.

UNIT - IV:

Process: Process Concept, process identification, process control - process creation, waiting for a process, process termination, Kernel support for process, zombie process, orphan process, Process APIs. Signals - Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT - V:

Inter Process Communication: Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes-creation, IPC between related processes using unnamed pipes, FIFOs- creation, IPC between unrelated processes using FIFOs (Named pipes), differences between unnamed and named pipes, open and close library functions. Message Queues- APIs for message queues, Semaphores-APIs for semaphores Shared Memory: APIs for shared memory. Sockets: Introduction to Sockets, Socket address structures, Socket system calls for connection oriented protocol and connectionless protocol.

TEXT BOOKS:

- 1. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
- 2. Unix and Shell Programming, B. A. Forouzan and R. F. Gilberg, Cengage Learning.
- 3. Unix Network Programming, W. R. Stevens, PHI.

REFERENCE BOOKS:

- 1. Unix System Programming using C++, T. Chan, PHI.
- 2. Beginning Linux Programming, 4th Edition, N. Mathew, R. Stones, Wrox, Wiley India Edition.
- 3. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.
- 4. Unix shell Programming, S. G. Kochan and P. Wood, 3rd edition, Pearson Education.
- 5. Shell Scripting, S. Parker, Wiley India Pvt. Ltd.
- 6. C Programming Language, Kernighan and Ritchie, PHI.

COMPUTER NETWORKS

Course Objectives:

- To introduce the students with general overview of the concepts and fundamentals of computer networks.
- Familiarize the students with the standard models for the layered approach to communicate between machines in a network and the protocols of the various layers.

Course Outcomes:

- Understand the concept of network reference models.
- Able to analyze various connecting devices of a network and describe multichannel access protocols.
- Analysis of routing algorithm and congestion algorithms and classify IPV4 addressing scheme.
- Discuss application layer protocols.

UNIT - I:

Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media.

Data Link Layer - design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol

UNIT - II:

Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

UNIT - IV:

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, ICMP, ARP, RARP, DHCP.

Transport Layer: Services provided to the upper layers elements of transport protocoladdressing connection establishment, connection release, Connection Release, Crash Recovery.

UNIT - V:

The Internet Transport Protocols: UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS.

TEXT BOOKS:

- Data Communications and Networking Behrouz A. Forouzan, Fifth Edition TMH, 2013.
- 2. Computer Networks Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCE BOOKS:

- 1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition Pearson Education.
- Understanding Communications and Networks, 3rd Edition, W.A.Shay, Cengage Learning.
- Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J.David Irwin, CRC Press.
- Computer Networking: Atop Down Approach Featuring The Internet, James F.Kurose, K.W.Ross, 3rd Edition, Pearson Education.

OPERATING SYSTEMS

Course Objectives:

- To understand main components of OS and their working
- To study the operations performed by OS as a resource manager
- To understand the different scheduling policies of OS
- To understand the different memory management techniques
- To understand process concurrency and synchronization
- To understand the concepts of input/ output, storage and file management
- To study different OS and compare their features.

Course Outcomes:

- 1. Understand the basic functions of Operating systems and concepts of process management.
- 2. Analyze the concepts of concurrency and Memory management.
- 3. Analyze the deadlock concepts and file system interface and management.
- 4. Understand the concepts of MASS storage structure and compare different protection methods of OS.

UNIT - I:

Operating System Introduction: Operating Systems Objectives and functions, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, Special - Purpose Systems, Operating System services, user OS Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, Virtual Machines.

UNIT - II:

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling, Scheduling Criteria, Scheduling algorithms, Thread scheduling, Case studies: Linux, Windows.

Process Coordination - Process Synchronization, The Critical section Problem, Peterson's solution, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

UNIT - III:

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table, Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement Algorithms, Thrashing.

LTPC

3 1 0 3

UNIT - IV:

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation - File System Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance.

Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management.

UNIT - V:

Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.

Protection - System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

TEXT BOOKS:

- 1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
- 2. Operating systems Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCES BOOKS:

- 1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
- 2. Operating Systems A concept based Approach, 2nd Edition, D. M. Dhamdhere, TMH.
- 3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
- 4. Operating Systems, A. S. Godbole, 2nd Edition, TMH

L T P C 3 1 0 3

FORMAL LANGUAGES AND AUTOMATA THEORY

Course Objective:

- Understand formal definitions of machine models.
- Classify machines by their power to recognize languages.
- Understanding of hierarchical organization of problems depending on their complexity
- Understanding of undecidable problems

Course Outcome:

At the end of the course, students will be able to

- Construct finite state diagrams while solving problems of computer science
- Construct Grammars for given Automata
- Find solutions to the problems using Turing machines
- Design of new grammar and language

UNIT-I

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers. Finite Automata: NFA with e transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without e-transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Introduction to Finite Automata with output.

UNIT- II

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets (proofs not required), closure properties of regular sets (proofs not required) Grammar Formalism : Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, and sentential forms. Rightmost and leftmost derivation of strings.

UNIT-III

Context Free Grammars: Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages. Enumeration properties of CFL (proofs omitted).Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.

UNIT-IV

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required). Linear bounded automata and context sensitive language.

UNIT- V

Computability Theory: Chomsky hierarchy of languages, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility.

TEXT BOOKS:

- 1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J.D. Pearson Education.
- 2. Introduction to Theory of Computation —Sipser 2nd edition Thomson.

REFERENCE BOOKS:

- 1. Introduction to Formal languages Automata Theory and Computation Kamala Krithivasan Rama R.
- 2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
- 3. Theory Of Computation: A Problem-Solving Approach, Kavi Mahesh, Wiley India Pvt. Ltd.
- 4. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
- 5. Theory of Computer Science Automata languages and computation-Mishra and Chandrashekaran, 2nd edition, PHI.

LTPC

3 1 0 3

PROFESSIONAL ELECTIVE – I PRINCIPLES OF PROGRAMMING LANGUAGES

Course Objectives:

- To briefly describe various programming paradigms.
- To provide conceptual understanding of High level language design and implementation.
- To introduce the power of scripting languages.

Course Outcomes:

- Ability to apply suitable programming paradigm for the application.
- Ability to express syntax and semantics in formal notation.
- Apply Object Oriented, Concurrency programming constructs
- Gain knowledge on comparing the features of programming languages.

UNIT I:

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments

UNIT II:

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types.

UNIT III:

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

Subprograms and Blocks: Fundamentals of sub-programs, Scope of life time of variables, static and dynamic scope, design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co-routines.

UNIT IV:

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

UNIT V:

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Scripting Language: Case Study: Python- Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction.

TEXT BOOKS:

- 1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
- Programming Language Design Concepts, D. A. Watt, Wiley dreamtech, rp-2007.

REFERENCE BOOKS:

- 1. Programming Languages, 2nd Edition, A. B. Tucker, R. E. Noonan, TMH.
- 2. Programming Languages, K. C. Louden, 2nd Edition, Thomson, 2003.
- 3. LISP Patric Henry Winston and Paul Horn Pearson Education.
- 4. Programming in Prolog, W. F. Clocksin & C. S. Mellish, 5th Edition, Springer.
- 5. Programming Python, M. Lutz, 3rd Edition, O'reilly, SPD, rp-2007.
- 6. Core Python Programming, Chun, II Edition, Pearson Education, 2007.
- 7. Guide to Programming with Python, Michel Dawson, Thomson, 2008

PROFESSIONAL ELECTIVE – ILTPCHUMAN COMPUTER INTERACTION3103

Course Objectives:

The student should be made to:

- Learn the foundations of Human Computer Interaction.
- Be familiar with the design process.
- Learn about various models and theories.
- Be aware of mobile HCI.
- Learn the guidelines for web interface.

Course Outcomes:

Upon completion of the course, Students will be able to:

- Explain the capabilities of both humans and computers from the viewpoint of human information processing.
- Describe and use HCI design principles, standards and guidelines.
- Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.
- Discuss about different mobile applications and related design issues.
- Analyze and discuss HCl issues in virtual reality, multimedia, and Word Wide Web-related environments.

UNIT I

FOUNDATIONS OF HCI: The Human- I/O channels, Human Memory, Thinking: Reasoning and problem solving; The computer-Display Devices, Memory, processing and networks; The Interaction- Models of interaction, frameworks and HCI, Ergonomics, Interaction styles, Elements of the WIMP interface, Interactivity; Paradigms.

UNIT II

DESIGN PROCESS: Interaction Design basics – The process of design, Scenarios, Navigation design, Screen Design and layout, Iteration and prototyping.

HCI in software process – software life cycle, Usability engineering, Prototyping in practice, Design rationale.

Design rules – Principles to support usability, Standards, guidelines, Golden rules and heuristics. **Evaluation Techniques**, Universal **Design**.

UNIT III

MODELS AND THEORIES: Cognitive models, Socio-Organizational issues and stake holder requirements, Communication and collaboration models.

UNIT IV:

MOBILE HCI: Mobile Ecosystem-Platforms, Application frameworks.

Types of Mobile Applications: Widgets, Applications, Games, Mobile Information Architecture.

Mobile Design: Elements of Mobile Design, Tools; Mobile 2.0.

UNIT V

WEB INTERFACE DESIGN: Drag & Drop, Overlays, Inlays and Virtual Pages, Process Flow.

TEXT BOOKS:

- 1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition, Pearson Education, 2004 (UNIT I, II & III).
- Brian Fling, "Mobile Design and Development", First Edition, O'Reilly Media Inc., 2009 (UNIT–IV).
- 3. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O'Reilly, 2009. (UNIT-V).

REFERENCE BOOKS

- 1. The essential guide to user interface design, Wilbert 0 Galitz, Wiley DreamTech.
- 2. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
- 3. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.

II Year B.Tech. CSE – I Sem

L	Т	Ρ	С
3	1	0	3

PROFESSIONAL ELECTIVE – I SOFTWARE PROJECT MANAGEMENT

Course Objectives

The objectives of the course can be characterized as follows.

- Understanding the specific roles within a software organization as related to project and process management
- Understanding the basic infrastructure competences (e.g., process modeling and measurement)
- Understand the principles, techniques, methods & tools for model-based management of software projects
- Understanding the basic steps of project planning, project management. Quality assurance, and process management and their relationships.

Course Outcomes

At the end of the course, the student shall be able to:

- Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
- Describe Artifacts of the process and process automation.
- Compare and differentiate organization structures and project structures.
- Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

UNIT I

Conventional Software Management: The waterfall model, conventional software Management performance. Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

UNIT II

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

The old way and the new: The principles of conventional software engineering, principles of modern software management, transitioning to an iterative process.

UNIT III

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

Model based software architectures: A Management perspective and technical perspective.

UNIT IV

Work Flows of the process: Software process workflows, Inter trans workflows.

Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction planning process, Pragmatic planning.

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building Blocks, the Project Environment.

UNIT V

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Example: Future Software Project Management: Modern Project Profiles Next generation Software economics, modern Process transitions.

Case Study: The Command Center Processing and Display System-Replacement (CCPDS-R).

TEXT BOOKS:

1. Software Project Management, Walker Royce, Pearson Education, 1998

REFERENCE BOOKS:

- 1. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, Tata Mc- Graw Hill, 2006.
- 2. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
- Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly, 2007 Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, second edition, Wiley India, 2004.

L T P C 0 0 3 2

OPERATING SYSTEMS & COMPUTER NETWORKS LAB THROUGH LINUX

Objectives:

- To understand the operating System functionalities.
- To understand the functionalities of various layers of OSI model

Part - A: Operating Systems

Week 1: Basic commands in Linux

(i) File handling utilities

a) cat b) mv c) rm d) cp

(ii) Directory commands

a) mkdir b) cd c) ls d) rmdir

Week2: Simulate the following CPU Scheduling Algorithms using C.

a) FCFS b) SJF

Week 3: Simulate the following CPU Scheduling Algorithms using C.

a) Priority b) Round Robin

Week 4: Simulate Paging Technique of Memory Management using C.

Week 5: Write a program to implement page replacement algorithms (FIFO, Optimal, and LRU).

Week 6: Write a C program to simulate the following file allocation strategies.

a) Sequential b) Indexed c) Linked

Week 7: Write a program to implement Banker's algorithm for deadlock avoidance.

Part - B: Computer Networks

Week 8: Design and Implement the data link layer farming methods such as character stuffing and bit stuffing.

Week 9: Implementation of Hamming code algorithm

Week 10: Implement CRC technique for any frame using generator polynomial.

Week 11: Implement Dijkstra's algorithm to compute the Shortest path through a graph.

Week 12: Take an example subnet graph with weights indicating delay between nodes. Construct Routing table art each node using Distance Vector Routing Algorithm.

Week 13: Analyze an example subnet of hosts. Construct and simulate broadcast tree for it.

III Year B.Tech. CSE – II Sem

L	Т	Р	С
3	1	0	3

WEB TECHNOLOGIES

Course Objectives:

- To introduce students with programming languages and techniques associated with the World Wide Web for creating dynamic web pages
- To Introduce Web- based media rich Programming Tools for developing Server side applications

Course Outcomes:

- Create web pages using HTML and Cascading Style Sheets
- Have understanding of client side scripting language -java script to build dynamic web pages
- Have understanding of XML and how to parse XML data with java
- Have understating of server side programming with PHP , Servlets , JSP and JDBC

UNIT –I

Introduction to HTML: HTML tags, Lists, Tables, Images, Forms, Frames, Cascading Style Sheets

Client Side Scripting: Java Script Language – Declaring variables, Scope of variables, Functions, Objects in java script, Dynamic HTML with java script, Form Validation.

UNIT –II

XML: Introduction to XML, Defining XML tags their attributes and values, Document Type Definition, XML Schema, Document Object Model, and XHTML.

Parsing XML Data: DOM and SAX Parsers in java.

AJAX A New approach: Introduction to Ajax, Simple Ajax Application

UNIT –III

Introduction to PHP:

Declaring variables, data types arrays, strings, operators, expressions, control structures, functions Reading data from web form controls like text boxes, radio buttons, lists etc. Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.

File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. binary files listing directories.

UNIT –IV

Introduction to Servlets: Common Gateway Interface (CGI), The Servlet API, Life cycle of a Servlet, Deploying a Servlet, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions.

Introduction to JDBC: JDBC Drivers, JDBC Process, Connecting to a Database using JDBC.

UNIT –V

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, Implicit Objects, Using Beans in JSP Pages, Using Cookies and Session for Session Tracking, Connecting to Database using JSP. **Introduction to MVC Architecture.**

TEXT BOOKS

- Programming the World Wide Web (7th Edition) 7th Edition by Robert W. Sebesta
- 2. Web Technologies Uttam K Roy, Oxford University Press
- 3. The Complete Reference PHP Steven Holzner, Tata McGraw-Hill

REFERENCE BOOKS

- 1. Web Programming, Building Internet Applications , Chris Bates $2^{\rm nd}$ edition , Wiley Dreamtech
- 2. Java Script , D Flanagan, O'Reilly, SPD
- 3. Java Server Pages- Hans Bergsten , SPD O'Reilly

COMPILER DESIGN

Course Objectives:

- To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.
- To learn how a compiler works and know about the powerful compiler generation tools and techniques, which are useful to the other non-compiler applications.
- To introduce the major concept areas of language translation and compiler design.
- To realize the computer science as the basis for real time applications

Course Outcomes:

- Able to differentiate the phases in compilation & parsing.
- Able to gain the knowledge in parsing and semantic analysis.
- Able to understand about symbol tables and code optimization methods.
- Able to analyze data flow and generate object code.

UNIT – I

Overview of Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

Top down Parsing: Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

UNIT – II

Bottom up parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC – automatic parser generator.

UNIT – III

Semantic analysis: Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Type checker.

Symbol Tables: Symbol table format, organization for block structures languages, hashing, and tree structures representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

UNIT – IV

Code optimization: Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

UNIT – V

Object code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

TEXT BOOKS:

- 1. Principles of compiler design -A.V. Aho. J.D.Ullman; Pearson Education.
- Modern Compiler Implementation in C Andrew N. Appel, Cambridge University Press.

REFERENCES:

- Compiler Construction- An Advanced Course Manish kumar Jha, Dhanpat Rai, Third completely Revised Version
- 2. Lex & yacc John R. Levine, Tony Mason, Doug Brown, O'reilly
- 3. Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wiley dreamtech.

	L .	
III Year B.Tech. CSE – II Sem	3	1

DATA WAREHOUSING AND DATA MINING

Course Objectives:

• To understand the evolution of data warehousing and data mining systems

.

Ρ

0

С

3

- Able to know how to preprocess the data.
- Understand Association and Classification Algorithms.
- To understand how data is grouped using clustering techniques.

Course Outcomes:

- Ability to understand the fundamentals of Data warehousing and OLAP technology.
- Ability to understand Data Mining and Data pre-processing.
- Analyze and apply association and classification algorithms on large data sets.
- Analyze and apply clustering techniques on large data.

UNIT - I

Data Warehouse and OLAP Technology: What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data ware housing to data mining.

UNIT - II

Introduction to Data Mining: What motivated data mining? Why it is important? So-What is Data mining, Data Mining-On What Kind of Data, Data Mining Functionalities-What kind of patterns can be Mined, Are All of the patterns Interesting, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data warehouse system, Major issues in Data mining.

Data pre-processing:- Why Preprocess the Data, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT – III

Mining Frequent Patterns, Associations and Correlations: Basic Concepts and a Road Map, Efficient and Scalable Frequent Item set Mining Methods, Mining Various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT – IV

Classification & Prediction: What is Classification? What is Prediction? Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back Propagation, Support Vector Machines, Associative Classification: Classification by Association Rule Analysis, Lazy Learners, Other Classification Methods, Prediction.

UNIT - V

Cluster Analysis: What is Cluster Analysis, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

Text Book:

- Data Mining- Concepts and Techniques by Jiawei Han, Micheline Kamber and Jian Pei –Morgan Kaufmann publishers – 2nd edition
- Introduction to Data Mining Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education

References:

- 1. Data Mining Techniques Arun K Pujari, 2nd edition, Universities Press.
- 2. Data Warehousing in the Real World Sam Aanhory & Dennis Murray Pearson Edn Asia.
- 3. Insight into Data Mining,K.P.Soman,S.Diwakar,V.Ajay,PHI,2008.
- 4. Data Warehousing Fundamentals Paulraj Ponnaiah Wiley student Edition

L	Т	P	С
3	1	0	3

III Year B.Tech. CSE – II Sem

PROFESSIONAL ELECTIVE - II OBJECT ORIENTED ANALYSIS AND DESIGN

Course Objectives:

- To learn the concept of Object Oriented Software Development Process
- To get acquainted with UML Diagrams
- To understand Object Oriented Analysis Processes

Course Outcomes:

- Understand Object Oriented Software Development Process
- Gain exposure to Object Oriented Methodologies & UML Diagrams
- To apply Object Oriented Analysis Processes for projects
- Apply Unified Modeling Language Construct for Developing Structural Design of a given Project.

UNIT– I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture and Software Development Life Cycle.

UNIT– II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams. **Advanced Structural Modeling:** Advanced classes, advanced relationships, Interfaces, Packages.

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT- III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT-IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT– V

Case Study: The Unified library application, ATM System.

TEXT BOOKS

- 1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition
- 2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCE BOOKS

- 1. Analysis and Design and Unified Process, Craig Larman, Pearson Education.
- 2. Object Oriented Analysis, Design and Implementation, B.Dathan. S.Ramnath, Universities Press.
- 3. Learning UML 2.0, Russ Miles and Kim Hamilton, O'Reilly, SPD.

III Year B.Tech. CSE – II Sem

PROFESSIONAL ELECTIVE - IILTPCDISTRIBUTED SYSTEMS3103

Course Outcomes:

- Able to understand the characteristics of Distributed Systems and Global States.
- Able to differentiate the types of Interprocess communication.
- Able to Understand DNS and Able to implement file service Architecture.
- Able to Analyze the Distributed Transaction Management

Course Objective:

- To understand what and why distributed system is
- To understand theoretical concepts, namely, virtual time and agreement
- To understand IPC, Group communication and RPC concepts
- To understand the concepts of transaction in distributed environment

UNIT-I

Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges.

System Models: Introduction, Architectural Models, Fundamental Models.

UNIT-II

Time and Global States: Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging, Distributed Mutual Exclusion.

UNIT-III

Interprocess Communication: Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT-IV

Distributed File Systems: Introduction, File Service Architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew File System.

Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

UNIT- V

Transactions and Concurrency Control: Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control.

Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols.

TEXT BOOK

 Distributed Systems, Concepts and Design, George Coulouris, J Dollimore and Tim Kindberg, Pearson Education, 4th Edition 2009.

REFERENCE BOOKS

- Distributed Systems, Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen, 2nd Edition, PHI.
- Distributed Systems, An Algorithm Approach, Sukumar Ghosh, Chapman&Hall/CRC, Taylor & Fransis Group, 2007.

III Year B.Tech. CSE – II Sem

PROFESSIONAL ELECTIVE - II

INFORMATION RETRIEVAL SYSTEMS

Course Objectives:

- Study fundamentals of DBMS, Data warehouse and Digital libraries
- Learn various preprocessing techniques and searching and indexing approaches in text mining
- Know various clustering approaches and study different similarity measures and different cognitive approaches used in text retrieval systems
- Know about query languages and online IR system

Course Outcomes

By the end of this course the student should be able to:

- Recognize the Boolean Model, Vector Space Model, and Probabilistic Model.
- Understand retrieval utilities and different formatting tags
- Understand cross-language information retrieval
- Understand the clustering techniques and determine the efficiency.

UNIT-I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

Information Retrieval System Capabilities: Search, Browse, Miscellaneous

UNIT-II

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

UNIT-III

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT-IV

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT-V

Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

TEXTBOOK:

1.Kowalski, Gerald, Mark T Maybury: Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.

REFERENCES:

- 1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
- 2. Modern Information Retrival by Yates Pearson Education.
- 3. Information Storage & Retieval by Robert Korfhage John Wiley & Sons.

III Year B.Tech. CSE - II Sem

L	Т	Р	С
0	0	3	2

WEB TECHNOLOGIES & CASE TOOLS LAB

Part – A: Web Technologies

Objectives:

To enable the students to program web applications using the following technologies: HTML, JavaScript, AJAX, PHP, Tomcat server, Servlets and JSP.

Week1:

- a) Write an HTML page including any required JavaScript that takes a number from one text field in the range of 0 to 999 and shows it in another text field words. If number is out of range, it should show "out of range" and if it is not a number, it should show "not a number "message in the result box.
- b) Write an HTML page that has one input, which can take multi-line text and a submit button. Once the user clicks the submit button, it should show the number of characters ,words and lines in the text entered using an alert message. words are separated with white spaces and lines are separated with new line character.

Week 2:

Write an HTML page that contains a selection box with a list of 5 countries .when the user selects a country; its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital color, bold and font size

Week 3:

Create an XML document that contains 10 users information, write a java program which takes user id as input and returns the user details by taking the user information from the XML document using (a) DOM parser (b) SAX parser

Week 4:

Implement the following web application using PHP

- i. A user validation web application, where the user submits the login name and password to the server. The name and password are checked against the data already available in database and if the data matches a successful login page is returned otherwise a failure message is shown to the user.
- ii. Modify above program to use an xml file instead of database.
- iii. Modify the above program to use AJAX to show the result on the same page below submit button.
- iv. A sample calculator web application that takes two numbers and an operator(+,-,*,/,%) from an HTML page and returns the result page with the operation performed on the operands.
- v. Modify the above program such that it stores each query in the database and checks the database first for the result. If the query is already available in the Debit returns the value that was previously computed (from DB) or it computes the result and returns it after storing the new query and result in DB.

- vi. A web application takes a name as input and on submit it shows a hello <name>page where <name> is taken from the request ,it shows the start time at right top corner of the page and provide logout button. On clicking button, it should show a logout page with thank you <name> message with the duration of usage (HINT: use session to store name and time)
- vii. A web application that takes name and age from the HTML page. if the age is less than 18, it should send a page with "Hello<name>, you are not authorized to visit this site" message , where <name>, should be replaced with the entered name. otherwise it should send "welcome <name> to this site" message.
- viii. A web application for implementation: The user is first served a login page which takes user's name and password. After submitting the details the server checks these values against the data from the data base and takes the following decisions;
- If name and password matches ,serves a welcome page with user's full name If name matches and password doesn't match ,then serves 'password mismatch' page If name is not found in the database, serves a registration page ,where user's full name is asked and on submitting the full name ,it stores ,the login name, password and full name in the database(HINT: use session for storing the submitted login name and password).
- ix. A web application that lists all cookies stored in the browser on clicking "list cookies "button. Add cookies if necessary.

Week 5:

Implement the week 4 web applications using servlets

Week 6:

Implement the Week 4 web application using JSP

Part – B: Case Tools lab

Objectives:

- Understand how UML supports the entire OOAD process
- Become familiar with all phases of OOAD.
- Understand different software testing tools and their features.
 - Student are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM systems whose description is given below:

UML diagrams to be developed are

- 1. Use case diagram
- 2. Class diagram
- 3. Sequence diagram
- 4. Collaboration diagram
- 5. State diagram
- 6. Activity diagram
- 7. Component diagram
- 8. Deployment diagram

Description of an ATM system

The software to be designed will control a simulated Automated Teller Machine (ATM) having magnetic stripe reader for reading an ATM card, a customer console (Keyboard and Display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash(in multiples of Rs 100, Rs 500 and Rs 1000) a printer for printing customer receipts and Key operated switch to allow an operator to start or stop the machine. The ATM will communicate with the banks over an appropriate a communication link (the software on the latter is not part of the requirements for this problem).

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned – except as noted below.

The ATM must be able to provide the following services to the customer:

- 1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs 100, Rs 500 and Rs 1000. Approval must be obtained from the bank before the cash is dispensed.
- 2. A customer must be able to make the deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
- 3. A customer must be able to make a transfer of money between any two accounts linked to the card.
- 4. A customer must be able to make a balance enquiry of any account linked to the card.
- 5. A customer must be able to abort a transaction in progress by pressing the cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit a second message will be sent to the bank indicating that the customer has deposited the envelope(if the customer fails to deposit the envelop within the timeout period, or pressed cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer).

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. The customer is unable to successfully enter the PIN after three trails, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.
If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction.

The ATM will have a key operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the ON position the operator will be required to verify and enter the total cash on hand. The machine can only be turned OFF when it is not servicing a customer. When the switch is moved to OFF position, the machine will shut down so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts etc.

III Year B.Tech. CSE - II Sem

COMPILER DESIGN & DATA MINING LAB

Part - A: Compiler Design Course Objectives:

• To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.

Consider the following mini Language, a simple procedural high-level language, only operating on integer data, with a syntax looking vaguely like a simple C crossed with Pascal. The syntax of the language is defined by the following BNF grammar.

Course Outcomes:

- Able to understand the practical approach of how a compiler works.
- Enables the knowledge to work in the development phase of new computer languages in industry.

```
<program> ::= <block>
<block> ::= { <variabledefinition> <slist> } | { <slist> }
<variabledefinition> ::= int<vardeflist>;
<vardeflist> ::= <vardec> | <vardec>, <vardeflist>
<vardec> ::= <identifier> | <identifier> [ <constant> ]
<slist> ::= <statement> | <statement>; <slist>
<statement> ::= <assignment> | <ifstatement> | <whilestatement> | <block> |
<printstatement> | <empty>
<assignment> ::= <identifier> = <expression> | <identifier> [ <expression> ] =
<expression>
<ifstatement> ::= <bexpression> then <slist> else <slist> endif | if <bexpression>
then <slist> endif
<whilestatement> ::= while <bexpression> do <slist> enddo
<printstatement> := print ( <expression> )
<expression> ::= <expression> <additionop> <term> | <term> | addingop>
<term>
<br/>

<relop> ::= < | <= | == | >= | > | !=
< addingop > ::= + | -
<term> ::= <term> <mulitop> <factor> | <factor>
<multop> ::= * | /
<factor> ::= <constant> | <identifier> | <identifier> [ <expression> ] | (
<expression>)
<constant> ::= <digit> | <digit> <constant>
<identifier> ::= <identifier> <letterordigit> | <letter>
<letterordigit> ::= <letter> | <digit>
<letter> ::= a|b|c|d|e|f|g|h|i|j|k|||m|n|o|p|q|r|s|t|u|v|w|x|y|z
<digit> ::= 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
```

<empty> has the obvious meaning

Comments (zero or more characters enclosed between the standard C / Java style comment brackets /*...*/) can be inserted.

```
A simple program written in this language is:
{
 int a[3], t1, t2;
 t1 = 2;
 a[0] = 1; a[1] = 2; a[t1] = 3;
 t^2 = -(a^2 + t^1 * 6) / a^2 - t^1);
 if t_2 > 5 then
 print(t2);
 else
 {
  int t3:
  t3 = 99;
  t^2 = -25:
   print(-t1 + t2 * t3); /* this is a comment on 2 lines */
 }
 end if
```

}

Week 1: Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.

Week 2: Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.

Week 3: Design Recursive decent parser for the given language.

Week 4: Design LALR bottom up parser for the given language.

Week 5: Convert the BNF rules into YACC from and write code to generate abstract syntax tree.

Week 6: Design a Machine code for the Given Intermediate code.

The instruction set is defined as follows:

MOV A, R

moves the integer value specified by A into register R.

ADD A, R

adds the value specified by A to register R, leaving the result in register R.

SUB A, R

subtracts the value specified by A from register R, leaving the result in register

R. MULA, R

multiplies the value specified by A by register R, leaving the result in register R.

DIV A, R

divides register R by the value specified by A, leaving the result in register R. NOP

is an instruction with no effect. It can be tagged by a label.

STOP

stops execution of the machine. All programs should terminate by executing a STOP instruction.

Part - B: Data Mining

Course Objectives:

- To attain knowledge in fundamentals of data miming, warehousing and data reprocessing techniques.
- To describe the basic principles and algorithms used in practical data mining and understand their strengths and weaknesses.
- To apply data mining techniques to solve problems in other disciplines in a mathematical way.
- To apply data mining methodologies and identify different trends in data mining.

Course Outcomes:

- Ability to add mining algorithms as a component to the existing tools.
- Able to apply mining techniques for realistic data.

Week-1: Analyze a sample dataset using classification technique in WEKA Tool.

Week-2: Demonstrate Apriori based Association Rule Mining.

Week-3: Demonstrate FP –growth based Association Rule Mining.

Week-4: Demonstrate K-means Clustering Algorithm.

Week-5: Demonstrate PAM based Clustering.

Week-6: Analyze German Credit Data Assessment using various Data mining Techniques.

OPEN ELECTIVES

Introduction

The B.Tech course structure under CBCS consists of 4 Professional Electives and 3 open electives. Each professional elective offered by the students own department gives a choice of three to four courses out of which the student is to select one course. Similarly under open elective system, the student is offered one course each in 3 semesters viz., 3/1, 3/2 & 4/1 with 3 credits.

The six engg. and along with MBA depts. of the college have been divided into four groups Group-I - ECE & EEE Group –II - CSE & IT Group –III - Mechanical & Civil Group –IV- MBA Under CBCS, a student from a particular group cannot opt the courses offered by that particular group.

Details of the Courses offered by different Groups -1 Courses offered by Group -1 Departments

ECE

<u>III Year – I Semester</u> 1. Introduction to Microcontrollers & Applications 2. Basic Electronics & Instrumentation <u>III Year – II Semester</u> 1. Fundamentals of Embedded Systems 2. Principles of Communications

EEE

<u>III Year – I Semester</u>

- 1. Non Conventional Energy Sources
- 2. Energy Management
- <u>III Year II Semester</u>
- 1. Principles of Electrical Power Utilization
- 2. Energy Auditing & Conservation

Courses offered by Group-2 Departments CSE/IT

- <u>III Year I Semester</u>
- 1. Java Programming
- 2. Operating Systems
- <u>III Year II Semester</u>
- 1. Database Management Systems
- 2. Software Engineering

Courses offered by Group-3 Departments MECH

<u>I Semester</u>

- 1. Elements of Mechanical Engineering
- 2. Industrial Engineering

II Semester

- 1. Basic Automobile Engineering
- 2. Material Science and Engineering

CIVIL

- <u>l Semester</u>
- 1. Remote Sensing and GIS
- 2. Smart City
- <u>II Semester</u>
- 1. Green Building
- 2. Environmental Pollution and Control Methods

Courses offered by Group-4 Department MBA

<u>I Semester</u> Total engineering Quality Management <u>II Semester</u> Basics of Banking and Capital Market

4 0 0 3 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

LTPC

PRE REQUISITES:

- Probability and statistics
- Operation research
- Mathematics-I
- Environmental studies

Course Objectives: To enable the student to understand, with a practical insight,

- The importance of certain basic issues governing the business operations namely demand and supply, production function, cost analysis,
- analysis of markets, forms of business organizations,
- Significance of capital budgeting and financial accounting and financial analysis.

UNIT –I:

Introduction to Managerial Economics& Demand Analysis:

Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

UNIT –II:

Production & Cost Analysis:

Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts (Opportunity cost vs outlay costs, Fixed, variable and semi variable costs, marginal cost vs average cost, out of pocket vs book cost, imputed cost, implicit & explicit cost, incremental and decremental cost, sunk vs future cost, separable and joint costs) Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

UNIT –III:

Markets & New Economic Environment:

Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing: Objectives and Policies of Pricing. Methods of Pricing. Business: Features and evaluation of different forms of Business Organization: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment: Changing Business Environment in Post-liberalization scenario.

UNIT-IV: Introduction to Financial Accounting & Financial Analysis:

Accounting concepts and Conventions Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).Financial Analysis: Analysis and Interpretation of Liquidity Ratios (current ratio, quick ratio), Activity Ratios(inventory turnover ratio, debtors turnover ratio), and Capital structure Ratios(debt equity ratio, interest coverage ratio) and Profitability ratios(gross profit ratio, net profit ratio, operating profit ratio, P/E ratio, EPS). Du Pont Chart.

UNIT -V: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital, Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), Net Present Value Method (simple problems), IRR and PI method.

Outcomes: At the end of the course the students is expected

- To understand and enhance the knowledge regarding managerial economics concepts and obtaining optimal solutions.
- To get an idea of analysis of firm's financial position with the techniques of financial analysis and ratio analysis.

TEXT BOOKS:

- 1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2012.
- Vijay Kumar & Appa Rao, Managerial Economics & Financial Analysis, Cengage 2011.
- J.V.Prabhakar Rao & P.V.Rao, Managerial Economics & Financial Analysis, Maruthi Publishers, 2011.

REFERENCE BOOKS:

- 1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2012.
- 2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, Pearson, 2012.
- 3. Lipsey & Chrystel, Economics, Oxford University Press, 2012
- 4. Domnick Salvatore: Managerial Economics in a Global Economy, Thomson, 2012.
- Narayanaswamy: Financial Accounting—A Managerial Perspective, Pearson, 2012.
- 6. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2012.
- 7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2012.
- 8. Dwivedi: Managerial Economics, Vikas, 2012.
- 9. Kasi Reddy, Saraswathi, MEFA, PHI Learning, 2012.
- 10. Shailaja & Usha : MEFA, University Press, 2012.

ADVANCED COMMUNICATION SKILLS (ACS) LAB (Common to all branches)

The introduction of the Advanced Communication Skills Lab is considered essential at 3^{rd} year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.

Objectives:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

 To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educational English speakers and respond appropriately in different socio-cultural and professional contexts.

Syllabus:

The following course content to conduct the activities is prescribed for the Advanced Communication Skills (ACS) lab:

- Activities on Fundamentals of inter-personal Communication and Building Vocabulary – Starting a conversation – responding appropriately and relevantly – using the right body language - Role Play in different situations & Discourse Skills – using visuals – Synonyms and antonyms, word roots, one word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.
- Activities on Reading Comprehension General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.
- Activities on Writing Skills Structure and presentation of different types of writing – letter writing/ Resume writing/ e-correspondence/ Technical report writing / Portfolio writing – planning for writing – improving one's writing.

- 4. Activities on Presentation Skills Oral presentations (individual and group) through JAM sessions/seminars/PPTs and written presentations through posters/projects/reports/e-mails/assignments etc.
- 5. Activities on Group Discussion and interview Skills Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation. Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video conference and Mock Interviews.

Books Recommended:

- 1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University 2009.
- 2. Advanced Communication Skills Laboratory Manual by Sudha Rani, D. Pearson Education 2011.
- Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
- Business and Professional Communication: Keys for Workplace Excellence. Kelly M. Quintanilla & Shawn T. Wahl. Sage South Asia Edition. Sage Publications. 2011.
- 5. The Basics of Communication: A Relational Perspective. Steve Duck & David T. Mc Mahan. Sage South Asia Edition. Sage Publications. 2012.
- 6. English Vocabulary in Use series, Cambridge University Press. 2009
- 7. Management Shapers Series by Universities Press (India) Pvt. Ltd. Himayatnagar, Hyderabad. 2008.
- 8. Handbook for Technical Communication by David A. McMurrey & Joanna Buckley. 2012. Cengage Learning.
- 9. Communication Skills by Leena Sen.PHI Learning Pvt. Ltd. New Delhi. 2009.
- 10. Handbook for Technical Writing by David A McMurrey & Joanna Buckley Cengage Learning. 2008.
- 11. Job Hunting by Colm Downess, Cambridge University Press 2008.
- 12. Master Public Speaking by Anne Nicholls, JAICO Publishing House, 2006.
- 13. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hill. 2009.
- 14. Books on TOEFL/GRE/GMAT/ICAT/IELTS by Barron's/DELTA/Cambridge University Press.
- 15. International English for Call Centres by Barry Tomalin and Suhashini Thomas Macmillan Publishers. 2009.

L T P C 2 0 0 2

PERSONALITY DEVELOPMENT AND BEHAVIOURAL SKILLS

Course Objectives

- To enable students to communicate with outside and peer group members in an effective manner.
- To enable the students to give better presentation and explanation on their projects, posters and assignments this makes them industry ready.
- To perform better during Campus Recruitment and various interviews they face in their career.

Course Outcomes

At the end of the course a student is expected:

- To communicate with more confidence using better spoken and written English
- To give better presentation and explanation with the use of digital inventions
- To perform well during Campus Drives and different Interviews

Course Outcomes

<u>Unit – I</u>

Personality Development: Definition - Various Aspects of Personality Development -Behavioural Traits. Importance of Soft skills-Soft skills for a future Entrepreneur -Qualities of a good leader - Stress Management - Success stories.

<u>Unit - II</u>

Non Verbal Communication: Kinesics Haptics Proxemics Vocalics Oculesics Body Language in Interviews.

<u>Unit - III</u>

Team Dynamics: Different Types of Teams-role of an individual - Communicating as a group or team leader - Individual Presentations/Team Presentation. Case Studies: Project Presentations.

<u>UNIT-IV</u>

Technical Report Writing: Formats - Effective Resume Preparation - Covering Letter - Statement of Purpose (SoP).

<u>UNIT-V</u>

Role of Multimedia in Communication: Communication in a Digital Edge (Video Conference Etc.)

E-Correspondence: Recent Trends in Professional Communication - Social Networking: Importance, Effects.

Blogging: Creating of Blogs - Technical and Non – technical blogs – Success Stories and Case Studies.

Reference Books

- Barun, K Mitra, Personality Development and Soft Skills, Oxford University Press, 2nd Edition, 2016.
- 2. Gopalaswamy Ramesh, the Ace of Soft Skills: Attitude, Communication and Etiquette for Success, Pearson Education, 2013.
- 3. Krishna Mohan & Meera Banerji, Developing Communication Skills, Macmillan India Ltd, 2008.
- Krishna Mohan & Meenakshi Raman, Effective English Communication, Tata McGraw-Hill Publishing Company Ltd, 2008.
- 5. Arati Gurav, 50 Mantra's of Personality Development, Buzzingstock Publishing House, 2013.
- P. Kiranmai Dutt & Geetha Rajeevan, Basic Communication Skills, Cambridge University Pvt. Ltd2007.
- S.C. Sood, Mita Bose, Naresh Jain, Developing Language Skills, Manohar Publications, 2007, T.M. Farhathullah, Communication Skills for Technical Students, Orient Longman Pvt Ltd, 2002.

L T P C 2 0 0 2

QUANTITATIVE METHODS & LOGICAL REASONING

Course Objectives:

- The objective of this course is to enhance the problem solving skills in the areas of 'Quantitative Aptitude' and 'Reasoning' which will enable the students to better preparation for Campus Placements and competitive examinations.
- 2. To improve the logical thinking and mathematical ability of the students.

Course Outcomes:

At the end of the completion of the course a student is expected

- 1. To solve basic and complex mathematical problems in short time.
- 2. To perform well in various competitive exams and placement drives.

Quantitative Aptitude and Reasoning:

Unit – I

1. Number System:

Speed math's, Numbers, Factors, prime & Co primes, LCM & HCF, Divisibility rules, finding unit place digit and last two digits of an expression

2. Simple Equations:

Definition of Linear equation, word problems

3. Ratio, Proportion and Variations:

Definition of ratio, ratio of Proportion, Comparison of ratios, Compound ratio, Direct and indirect proportion

4. Percentages:

Converting fractions and decimal into percentages, successive percentage, populations, expenditure and savings

5. Profit and loss:

Relation between Cost price and selling price, Discount and Marked price, Gain or Loss percentages on selling price

6. Simple and Compound Interest:

Problems on interest (I), amount (A), Principal (P) and rate of interest(R) Difference between the simple interest and compound interest for 2 and 3 years.

Unit-II

1. Partnership:

Relation between partners, period of investment and shares

2. Averages and Ages:

Average of different groups, change in averages by Adding, deleting and Replacement of objects, problems on ages.

3. Allegation and mixtures:

Allegation rule, Mean value of the mixture, Replacement of equal amount of quantity.

Time and Work:

Men and Days, Work and Wages, pipes and cisterns, hours and work, Alternate day's concept,

Time and Distance:

Difference between the average and Relative speeds, reaching the destination late and early, Stoppage time per hour, time and distance between two moving bodies **Trains, Boats and Streams:**

Train crossing man, same and opposite directions, Speed of boat and stream,

Unit-III

1. Progressions:

Arithmetic, Geometric and Harmonic Progressions, Arithmetic Mean, Geometric Mean and Harmonic Mean and their relations.

2. Quadratic Equations:

General form of Quadratic equation, finding the roots of Quadratic equation, Nature of the Roots.

3. Mensurations:

2D geometry- perimeter, areas, 3D geometry - surface areas, volumes

4. Permutation and Combination:

Fundamental rules, problems on permutations & combinations.

5. Probability

Definition of probability, notations and formulae, problems on probability.

6. Data Interpretation and Data Sufficiency:

Tabular and Pie-charts, Bar and Line graphs, Introduction to data sufficiency, problems on data sufficiency.

Unit-IV

1. Deductions:

Statements and conclusions using Venn diagram and Syllogism method

2. Connectives:

Definition of simple and compound statements, Implications and negations for compound statements.

3. Series completion:

Number series, Alphabet series, letter series.

4. Coding and Decoding:

Letter coding, Number coding, Number to letter coding, Matrix coding, Substitution, Mixed letter coding, Mixed number coding, Deciphering individual letter codes by analysis.

5. Analytical Reasoning Puzzles:

Problems on Linear, Double line-up and Circular arrangements, Selections and Comparisons.

6. Blood Relations:

Defining the various relations among the members of a family, Solving Blood Relation Puzzles by using symbols and notations. Problems on Coded relations.

Unit-V

1. Direction sense test:

Sort of directions in puzzles distance between two points, problems on shadows, Application of triangular triplets.

2. Clocks:

Relation between minute-hour hands, angle vs time, exceptional cases in clocks

3. Calendars:

Definition of a Leap Year, Finding the Odd days, Finding the day of any random calendar date, repetition of calendar years.

4. Cubes and Dices:

Finding the minimum and maximum number of identical pieces and cuts, painting of cubes and cuts, problems on dice.

5. Venn diagrams:

Circular representation of given words, Geometrical representation of certain class, set theory based problems.

6. Number, Ranking and Time sequence test:

Number test, Ranking test, Time sequence test.

Text Books:

- 1. GL Barrons, Mc Graw Hills, Thorpe's verbal reasoning, LSAT Material
- 2. R S Agarwal, S.chand, 'A modern approach to logical reasoning'
- 3. R S Agarwal, S.Chand, 'Quantitative Aptitude'

Reference Books:

- 1. Quantitative Aptitude-G.L BARRONS
- 2. Quantitative Aptitude-Abhijit Guha Mc Graw Hills.
- 3. Quantitative Aptitude-U.Mohan Rao SCITECH.

S. No.	Subject Code	Subject Name	L	т	Р	Total Credits
	B. Tech IV Y	YEAR I SEMESTER				
1	A17531	Mobile Application Development	3	1	0	3
2	A17532	Information Security	3	1	0	3
3	A17533	Cloud Computing	3	1	0	3
		Professional Electives-3				
4	A17535	1.Big Data Analytics	3	1	0	3
-	A17536	2. Image Processing	Ŭ		Ŭ	Ŭ
	A17537	3. Internet of Things				
		Professional Electives-4				3
5	A17538	1.Advanced Databases	3	1	0	
-	A17540	2.Computer Graphics	÷	-	÷	-
	A17534	3.Software Testing Methodologies				
		Open Electives-3		-		•
6	A17541	1. Information System for Engineers	3	1	0	3
	A17542	2.Web Design				
7	A17593	Mobile Application Development Lab	0	0	3	2
8	Professional Elective Lab	A17594: Hadoop & Bigdata Lab A17595: Internet of Things Lab A17596: Image Processing with SCI Lab	0	0	3	2
9	MP-1	Industry Oriented Mini Project	0	0	0	2
		Total Credits				24
B. Tech IV YEAR II SEMESTER						
1	A18543	Design Patterns	3	1	0	3
2	A18544	E-Commerce	3	1	0	3
3	A18545	Semantic Web and Social Networks	3	1	0	3
4	TS	Technical Seminar	0	0	6	2
5	CVV	Comprehensive Viva-Voce	0	0	0	2
6	MP-II	Major Project	0	0	15	11
		Total Credits				24

B. TECH CSE IV YEAR COURSE STRUCTURE

L	Т	Ρ	С
3	1	0	3

MOBILE APPLICATION DEVELOPMENT

Course Outcomes: At the end of this course, the student would be able to:

- 1. Understand the concepts of J2ME.
- 2. Design a User Interface for a mobile application using J2ME.
- 3. Create a mobile application for small computing devices.
- 4. Apply the concepts of JDBC & Embedded SQL for database connection
- 5. Understand the generic connection framework.

UNIT-I

Small Computing Technology:

Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistance, Mobile Power, Set-Top Boxes, Smart Cards

UNIT-II

J2ME Overview:

Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices. J2ME Architecture and Development Environment:

J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit.

J2ME Best Practices and Patterns:

The Reality of Working in a J2ME World, Best Practices.

UNIT-III

Commands, Items, and Event Processing:

J2ME User Interfaces, Display Class, the Palm OS Emulator, Command Class, Item Class, Exception Handling.

High-Level Display Screens:

Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class Low-Level Display Canvas:

The Canvas, User Interactions, Graphics, Clipping Regions, Animation

UNIT-IV

Record Management System:

Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

JDBC Objects:

The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, Statement Objects, Result set, Exceptions, Model Programs.

JDBC and Embedded SQL:

Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWs.

UNIT-V

Generic Connection Framework:

The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process.

TEXT BOOKS

- 1. J2ME: The Complete Reference, James Keogh, Tata McGraw-Hill.
- 2. Programming for Mobile and Remote Computers, G.T.Thampi, drearntec press.

REFERENCE BOOKS

- 1. Enterprise J2ME: Developing Mobile Java Applications Michael Juntao Yuan, Pearson Education, 2004.
- 2. Beginning Java ME Platform, Ray Rischpater, 2009.
- 3. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, 2005.

L	Т	Ρ	С
3	1	0	3

INFORMATION SECURITY

Course Outcomes: At the end of this course, the student would be able to:

- 1. Identify various Security Attacks.
- 2. Understand various Encryption Principles and algorithms.
- 3. Analyze different Cryptography algorithms.
- 4. Understand various Security Associations and Key Management.
- 5. Design a Firewall for Security.

UNIT - I

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT-II

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT-III

Public key cryptography principles; public key cryptography algorithms; digital signatures, digital Certificates; Certificate Authority and key management Kerberos, X.509; Directory Authentication Service; Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT-IV

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT-V

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS

- 1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
- Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W. Manzuik and Ryan Permeh, Wiley Dreamtech.

REFERENCES

- 1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press).
- 2. Network Security Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
- 3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson.
- 4. Principles of Information Security, Whitman, Thomson.
- 5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH.
- 6. Introduction to Cryptography, Buchmann, Springer.

L	Т	Ρ	С
3	1	0	3

CLOUD COMPUTING

Course Outcomes: At the end of this course, the student would be able to:

- 1. Understand different Cloud Services
- 2. Analyze different approaches for migration into Cloud
- 3. Prioritize the challenges in Cloud Technology
- 4. Understand the virtualization concepts
- 5. Assess future research directions in Cloud Computing

UNIT -I

Introduction to Cloud Computing:

Cloud Computing in a Nutshell, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenge and Risks.

UNIT-II

Migration into a Cloud:

Introduction, Broad Approaches to Migrating into the Cloud, the Seven-Step Model of Migration into a Cloud.

Enriching the 'Integration as a Service' Paradigm for the Cloud Era:

An Introduction, The Onset of Knowledge Era, The Evolution of SaaS, the challenges of SaaS Paradigm, Approaching the SaaS integration enigma, New integration scenarios, The integration Methodologies, Saas integration products and platforms, SaaS Integration Services, Business to Business Integration (B2Bi) Services.

UNIT-III

The Enterprise Cloud Computing Paradigm:

Introduction, Background, Issues for Enterprise Applications on the Cloud, Transition Challenges, Enterprise Cloud Technology and Market Evolution, Business Drivers toward a Marketplace for Enterprise Cloud Computing, The Cloud Supply Chain.

UNIT-IV

Virtual Machines Provisioning and Migration Services:

Introduction and Inspiration, Background and Related Work, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action, Provisioning in the Cloud Context, Future Research Directions.

Secure Distributed Data Storage in Cloud Computing: Introduction, Cloud Storage: from LANs TO WANs, Technologies for Data Security in Cloud Computing Open Questions and Challenges.

UNIT-V

Data Security in the Cloud:

An Introduction to the idea of Data Security, The Current State of Data Security in the Cloud, Homo Sapiens and Digital Information, Cloud Computing and Data Security Risk, Cloud Computing and Identity, Digital Identity and Data Security, Content Level Security - Pros and Cons.

TEXT BOOK

1. Rajkumar Buyya, James Broberg, AndrZej Goscinski, Cloud Computing Principles and Paradigms, Wiley Publications.

REFERENCE BOOKS

- 1 Michael Miller, Cloud Computing Web-Based Application That Change the Way You Work and Collaborate Online, Pearson Publications.
- 2 Thomas Erl, Zaigham Mahmood, & Ricardo Puttini, Cloud Computing- Concepts, Technology & Architecture Pearson Publications.
- 3 Kai Hwang, Geoffrey C.Fox. Jack J. Dongarra, Distributed and Cloud Computing – From Parallel Processing to the Internet of Things, ELSEVIER Publications.

IV YEAR B.Tech. CSE -I Sem	L	Т	Ρ	С
	3	1	0	3

PROFESSIONAL ELECTIVE-3: BIG DATA ANALYTICS

Course Outcomes: At the end of the course, the student should be able to:

- 1. Explain the foundations, definitions, and challenges of Big Data.
- 2. Use Hadoop file system interfaces.
- 3. Program using HADOOP and Map reduce, NOSQL.
- 4. Understand various Hadoop Eco Systems like Pig, Hive.
- 5. Outline Hadoop eco system using HBase, Zookeper.

Unit – I INTRODUCTION TO BIG DATA AND HADOOP

Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System

UNIT II: HDFS(Hadoop Distributed File System)

The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

UNIT III: Map Reduce

Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features.

Unit IV: Hadoop Eco System-I

Pig: Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators.

Hive: Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions.

UNIT V: Hadoop Eco System-II

Hbase: HBasics, Concepts, Clients, Example, Hbase versus RDBMS. ZooKeeper: The Zookeeper Service, Zookeeper in Production Case Studies in Eco file system: Sqoop

TEXT BOOK

I. Tom White "Hadoop: The Definitive Guide" Third Edition, O'reily Media, 2012.

REFERENCE BOOKS

- 1 Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015. References
- 2 Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
- 3 Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013)
- 4 Tom Plunkett, Mark Hornick, "Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop", McGraw-Hill/Osborne Media (2013), Oracle press.
- 5 Anand Rajaraman and Jef rey David Ulman, "Mining of Massive Datasets", Cambridge University Press, 2012.
- 6 Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.
- 7 Glen J. Myat, "Making Sense of Data", John Wiley & Sons, 2007
- 8 Pete Warden, "Big Data Glossary", O'Reily, 2011.
- 9 Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.

L	Т	Ρ	С
3	1	0	3

PROFESSIONAL ELECTIVE-3: IMAGE PROCESSING

Course Outcomes (COs): After completion of the course, student would be able to:

- 1. Understand Digital image fundamentals,
- 2. Program Image Transformations,
- 3. Design Colour Image Processing and Restoration,
- 4. Implement Image segmentation techniques and
- 5. Program Image Compression techniques.

UNIT-I

Digital image fundamentals - Digital Image through scanner, digital camera. Concept of gray levels. Gray level to binary image conversion. Sampling and quantization. Relationship between pixels. Imaging Geometry.

UNIT-II

Image Transforms 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform. Image enhancement Point processing. Histogram processing. Spatial filtering.

UNIT-III

Enhancement in frequency domain, Image smoothing, Image sharpening. Colour image processing: Pseudo colour image processing, full colour image processing.

Image Restoration Degradation model, Algebraic approach to restoration, Inverse filtering, least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT-IV

Image segmentation Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation.

UNIT-V

Image compression Redundancies and their removal methods, Fidelity criteria, Image compression models, Source encoder and decoder, Error free compression, Lossy compression.

TEXT BOOK

1 Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education.

REFERENCES

- Image Processing with Scilab and Image Processing Design Toolbox; Dr. Eng. (J) Harald Galda, 2011.
- 2 Fundamentals of Digital Image processing A.K.Jain , PHI.
- 3 Digital Image processing using MAT LAB Rafael C. Gonzalez, Richard E Woods and Steven L. Edition, PEA, 2004.
- 4 Digital Image Processing William K. Pratt, John Wilely, 3rd Edition, 2004.

L	Т	Ρ	С
3	1	0	3

PROFESSIONAL ELECTIVE-3: INTERNET OF THINGS (IoT)

Course Outcomes: After completion of the course, student would be able to:

- 1. Describe various IoT enabled technologies.
- 2. Understand the concepts of M2M with necessary protocols.
- 3. Illustrate Python programming for IoT
- 4. Examine the Python programming with Raspberry PI
- 5. Design web applications for IoT

UNIT-I

Introduction to Internet of Things – Definition and Characteristics of IoT, Physical Design of IoT– IoT Protocols, IoT communication models, IoT Communication APIs IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT-II

loT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER.

UNIT-III

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, date/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib.

UNIT-IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, and reading input from pins.

UNIT-V

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs. Webserver – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API.

TEXT BOOKS

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547.

2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

L	Т	Ρ	С
3	1	0	3

PROFESSIONAL ELECTIVE-4: ADVANCED DATABASES

Course Outcomes: At the end of this course, the student would be able to:

- 1. Understand the concepts of Distributed Database Systems.
- 2. Identify different Architectural Models for Distributed DBMS.
- 3. Characterize the query processors.
- 4. Design Algorithms for Concurrency control Mechanisms.
- 5. Decide different Parallel DBMS Techniques based on given constraints.

UNIT-I

Introduction: Distributed Data Processing, Distributed Database System, Promises of DDBSs, Design Issues.

UNIT-II

Distributed DBMS Architecture: ANSI/SPARC, Centralized DBMS Architecture, Architectural Models for Distributed DBMS

Distributed Database Design: Top – Down Desin Process, Distribution Design Issues, Fragmentation, Allocation.

UNIT-III

Introduction to RDBMS: Overview of Relational DBMS: Relational Database Concepts, Normalization, Relational data languages.

Query Processing and decomposition: Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data.

UNIT-IV

Distributed query Optimization: Query optimization, centralized query optimization, Distributed query optimization algorithms.

Transaction Management: Definition, properties of transaction; types of transactions.

Unit - V

Distributed Concurrency control: Serializability theory, Concurrency control Mechanisms & Algorithms; Time stamped & Optimistic concurrency control algorithms, Deadlock Management, Relaxed Concurrency Control.

TEXT BOOK:

- 1. Distributed Databases Stefano Ceri and Willipse Pelagatti:, McGraw Hill.
- Principles of Distributed Database Systems, M.tamer Ozsu, Patrick Valduriez, 3rd Edition, Springer.

REFERENCE BOOKS:

- 1. Henry F Korth, A Silberchatz and Sudershan : Database System Concepts. Tata MGH.
- 2. Raghurama krishnan and Johhanes Gehrke: Database Management Systems, MGH.

L	Т	Ρ	С
3	1	0	3

PROFESSIONAL ELECTIVE-4: COMPUTER GRAPHICS

Course Outcomes: At the end of this course, the student would be able to

- 1. Understand the areas of Computer Graphics.
- 2. Analyze 2 D Geometrical transforms.
- 3. Analyze 3 D Geometrical transforms.
- 4. Apply different visible surface detection methods.
- 5. Design of animation sequence.

UNIT-I

Introduction:

Application areas of Computer Graphics, overview of graphics systems, video-display devices and raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

Output Primitives:

Points and lines, tine drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-II

2–D Geometrical Transformations:

Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms transformations between coordinate systems.

2-D Viewing:

The viewing piplino, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen- Sutherland and Cyrus-beck line clipping algorithms, Sutherland -Hodgeman polygon clipping algorithm.

UNIT-III

3-D Object Representation:

Polygon surfaces, quadric surfaces. spline representation, Hermite curve, Bezier curve and B-spine curves. Bezier and B-spline surfaces, sweep representations, octrees BSP Trees.

3-D Geometric transformations:

Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and Clipping.

UNIT-IV

Visible Surface Detection Methods:

Classification, back face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, and area sub division and octree methods.

Illumination Models and Surface Rendering Methods: Basic illumination models, polygon rendering method.

UNIT-V

Computer Animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame system, Motion specification.

TEXT BOOK

1 "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson education.

REFERENCE BOOKS

- 1 Computer Graphics Principles & practice, second edition In C, Foley, VanDam, Feiner and Hugues, Pearson Education.
- 2 "Computer Graphics Second edition", Zhigand xiang. Roy Plastock, Schaum's outlines. rats Mc Graw 19 edition.
- 3 Procedural elements of Computer Graphics, David F Rogers. Tata Mc Graw hill, 2nd edition.
- 4 Principles of interactive Computer Graphics. Neuman and Sprout TMH.
- 5 Principles of Computer Graphics. Shalni, Govil-Pal, Springer.
- 6 Computer Graphics F.S.H. S.M.Kelley. PHI.

L

3

PROFESSIONAL ELECTIVE-4: SOFTWARE TESTING METHODOLOGIES

Course Outcomes: At the end of this course, the student would be able to

- 1. Understand the purpose of Software testing.
- 2. Outline various transaction flow testing techniques.
- 3. Understand domain testing.
- 4. Construct decision tables for Logic Based Testing.
- 5. Implement node reduction algorithm.

UNIT-I

Introduction:

Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Flow graphs and Path testing basic concepts, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT-II

Transaction Flow Testing:

Transaction flows, transaction flow testing techniques.

Dataflow testing:

Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT-III

Domain Testing:

Domains and paths, Nice & ugly domains, domain testing. Domains and interfaces testing, domain and interface testing, domains and test ability.

UNIT-IV

Paths, Path products and Regular Expressions:

Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. Logic Based Testing overview, decision tables, path expressions, KV charts, specifications.

UNIT-V

State, State Graphs and Transition Testing:

State graphs, good & bad state graphs, state testing, Testability tips. Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

TEXT BOOK

1 Software Testing techniques — Boris Beizer, Dreamtech, second edition.

REFERENCE BOOKS

- 1 Software Testing Tools Dr.K.V.K.K.Prasad, Dreamtech.
- 2 The craft of software testing Brian Marick, Pearson Education.
- 3 Software Testing, 3rd edition, P.C. Jorgen sen, Aurbach publications (Dist.by SPD).
- 4 Software Testing, N.Chauhan, Oxford University press.
- 5 Introduction to Software Testing, P.Amman n & J offutt, cambridge Univ.Press.
- 6 Effective methods of Software Testing, perry, John Wiley, 2nd Edition, 1999.
- 7 Software Testing Concepts and Tools, P.Nageswara rao dreamtech Press.
- 8 Software Testing, M.G.Limaye, TMH.
- 9 Software Testing, S.Desikan, G.Ramesh, Pearson.
- 10 Foundations of Software Testing, D.Graham & other, cengage Learning
- 11 Foundations of Software Testing, A.P.Mathur, Pearson.

L T P C 0 0 3 2

HADOOP & BIGDATA LAB

Week 1, 2:

Implement the following Data structures in Java

 a) Linked Lists b) Stacks c) Queues d) Set e) Map

Week 3, 4:

 (i) Perform setting up and Installing Hadoop in its three operating modes:

- Standalone
- Pseudo distributed
- Fully distributed

(ii) Use web-based tools to monitor your Hadoop setup.

Week 5:

3. Implement the following file management tasks in Hadoop:

- Adding files and directories
- Retrieving files
- Deleting files

<u>Hint:</u> A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.

Week 6:

4. Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.

Week 7:

5. Write a Map Reduce program that mines weather data.

Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented.

Week 8:

6. Implement Matrix Multiplication with Hadoop Map Reduce

Week 9, 10:

7. Install and Run Pig then write Pig Latin scripts to sort, group, join, Project, and filter your data.

Week 11, 12:

8. Install and Run Hive then use Hive to create, alter, and drop Databases, tables, views, functions, and indexes

INTERNET OF THINGS LAB

List of Experiments

Week 1 & 2:

- 1. Setting up your Raspberry Pi. Installation of software.
- 2. Introduction to Raspberry Pi & Sensors
 - a. Temperature Sensors
 - b. Proximity Sensors
 - c. Pressure Sensors
- 3. Introduction to Sensors & Actuators
 - a. Humidity Sensors
 - b. Accelerometer & Gyroscope
 - c. Actuators
 - Ex: Motors

Week 3:

1. Introduction to IoT with The Thing Box & IFTTT

Week 4 & 5:

1. Build your own Raspberry Pi Web Server

Week 6:

1. Build a Web-App: Blinking an LED over Internet

Week 7&8:

1. Live Temperature and Humidity Monitoring over Internet

Week 9&10:

1. Introduction to Open Source Cloud Platforms for IoT: OpenIoT, ThingSpeak, thinger.io, Google Cloud Platform.

Week 11& 12:

1. IoT based Home Security System with Email

IMAGE PROCESSING LAB

List of Experiments

- 1. Display of Grayscale Images.
- 2. Histogram Equalization.
- 3. Non-linear Filtering.
- 4. Edge detection using Operators.
- 5. 2-D DFT and DCT.
- 6. Filtering in frequency domain.
- 7. Display of color images.
- 8. Conversion between color spaces.
- 9. DWT of images.
- 10. Segmentation using watershed transform.

MOBILE APPLICATION DEVELOPMENT LAB

LIST OF EXPERIMENTS

1 Installation of Java Wireless Toolkit (J2ME)

2 Working with J2ME Features

- Menu Creation
- Menu Events
- On Line Help MIDlet
- Input checking Phone number

3 Threads and High-level User Interfaces

- Text Slide Show
- Image Slide Show
- Implementing Non-Interactive Gauge
- Quiz MIDLet

4 Working on Drawing and Images

- Immutable Image
- Image Clip Region
- Implementing Bar Graph
- Implementing Pie Graph
- Keypad Events

5 Developing Networked Applications using the Wireless Toolkit

- 6 Authentication with Web Server
- 7 &8 Web Application using J2ME
IV YEAR B.Tech. CSE - II Sem

DESIGN PATTERNS

Course Outcomes:

At the end of this course, the student would be able to

1. Understand the Design patterns in software applications.

- 2. Discuss the Creational Patterns
- 3. Categorize the Structural Pattern.
- 4. Investigate Behavior Patterns
- 5. Construct the good design pattern structures

UNIT-I

Introduction:

What is a Design Pattern? Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design patterns, Organizing the Catalog, How Design patterns solve Design problems, how to select a Design Pattern, how to use a Design Pattern.

A Case Study:

Designing a Document Editor, Design Problems, Document Structure, Formatting Embellishing the User Interface, Supporting Multiple Look and Feel Standards, Supporting Multiple Window systems, User Operations Spelling Checking and Hyphenation, Summary.

UNIT-II

Creational Patterns:

Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-III

Structural Patterns:

Adaptor, Bridge and Composite, Decorator, Facade, Flyweight, proxy

UNIT-IV

Behavior Patterns:

Chain of Responsibility, Command, Interpreter, and Iterator, Mediator, Memento, Observer, State, strategy, Template Method, Visitor, Discussion on Behavioral Patterns.

UNIT-V

What to Expect from Design Patterns:

A brief History, The Pattern Community, An Invitation, A Parting Thought.

TEXT BOOK

1. Design Patterns: Elements of Reusable Object-Oriented Software; By Erich Gamma, Pearson Education.

REFERENCE BOOKS

- 1. Pattern's in JAVA Vol-I By Mark Grand, Wiley Dream Tech.
- 2. Pattern's in JAVA Vol II BY Mark Grand, Wiley Dream Tech.
- 3. JAVA Enterprise Design Patterns Vol III By Mark Grand, Wiley Dream TECH.
- 4. Head First Design Patterns By Eric Freeman Oreilly spd.
- 5. Peeling Design Patterns, Prof Meda Srinivasa Rao, Narsimha Karumanchi, Career Monk Publication.
- 6. Design Patterns Explained By Alan Shallowy, Pearson Education.
- 7. Pattern Oriented Software Architecture, af.Buschman & others, John Wiley & Sons.

IV YEAR B.Tech. IT - II Sem

L	Т	Ρ	C
3	1	0	3

E – COMMERCE

Course Outcomes:

At the end of this course, the student would be able to:

- 1. Identify the anatomy of E-Commerce applications.
- 2. Categorize different Electronic payment systems.
- 3. Examine Supply chain Management.
- 4. Analyze the various marketing strategies for an online business.
- 5. Design strategies for E-Commerce Catalogues.

UNIT-I

Electronic Commerce

Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications and E-Commerce organization applications. Consumer Oriented Electronic commerce, Mercantile Process models.

UNIT-II

Electronic Payment Systems

Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce – EDI, EDI Implementation, Value added networks.

UNIT-III

Intra Organizational Commerce – work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT-IV

Corporate Digital Library – Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing – Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT-V

Consumer Search and Resource Discovery

Information search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia – key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing.

TEXT BOOK

1. Frontiers of electronic commerce — Kalakata, Whinston, Pearson.

REFERENCES

- 1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
- 2. E-Commerce, S.Jaiswal Galgotia.
- 3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
- 4. Electronic Commerce Gary P.Schneider Thomson.

IV YEAR B.Tech. CSE - II Sem

L	Т	Ρ	С
3	1	0	3

SEMANTIC WEB AND SOCIAL NETWORKS

Course Objectives:

At the end of this course, the student would be able to

- 1. Understand knowledge representation for the Semantic Web Intelligence
- 2. Identify the role of Ontologies in the semantic web.
- 3. Learn Ontology Engineering.
- 4. Develop Semantic Web Applications and Services.
- 5. Create OWL-S Ontology for Web Services.

UNIT-I

Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web

UNIT-II

Ontologies and their role in the semantic web; Ontologies Languages for the Semantic Web —Resource Description Framework (RDF) / RDF Schema; Ontology Web Language (OWL), UML, XML/XML Schema.

UNIT-III

Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

UNIT-IV

Logic, Rule and Inference Semantic Web applications and services, Semantic Search, elearning, Semantic Bioinformatics, Knowledge Base.

UNIT-V

XML-based Web Services, Next Generation Web Services, Creating an OWL-S Ontology for Web Services. Semantic Search Technology, Search Engines, Semantic Search, Semantic Search Technology, Web Search Agents, Semantic Methods.

TEXT BOOKS

1. Thinking on the Web – Berners Lee, Gödel and Turing, Wiley interscience, 2008.

REFERENCE BOOKS

- 1. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.
- Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, Audi Studer, Paul Warren, John Wiley & Sons.
- Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers (Taylor & Francis Group)
- 4. Information sharing on the semantic Web Heiner Stucken schmidt; Frank Van Harmelen, Springer Publications.

GENERAL INTRODUCTION

The B.Tech course structure under CBCS consists of 4 Professional Electives and 3 open electives. Each professional elective offered by the students own department gives a choice of three to four courses out of which the student is to select one course. Similarly under open elective system, the student is offered one course each in 3 semesters viz., 3/1, 3/2 & 4/1 with 3 credits.

The six engg. and along with MBA depts. of the college have been divided into four groups: Group - I - ECE & EEE Group - II - CSE & IT Group - III - Mechanical & Civil Group - IV - MBA Under CBCS, a student from a particular group cannot opt the courses offered by that particular group.

Details of the Courses offered by different Groups

Group -1 Departments and Courses

ECE

<u>IV Year – I Semester</u>

- 1. Introduction to MATLAB
- 2. Circuit Simulation using PSpice

EEE

<u>IV Year – I Semester</u>

1. Electrical and Hybrid Vehicle

2. Energy Storage Systems

Group - 2 Departments and Courses

CSE & IT

<u>IV Year – I Semester</u>

1. Information Systems for Engineers

2. Web Design

Group -3 Departments and Courses

Mech.

<u>IV Year – I Semester</u>

1. Optimization Techniques

2. Maintenance and Safety Engineering

CIVIL

<u>IV Year – I Semester</u>

1. Elements of Civil Engineering

2. Introduction to Earthquake Engineering

Group - 4 Departments and Courses

MBA

<u>I Semester</u> Fundamentals of Entrepreneurship

OPEN ELECTIVES OFFERED BY CIVIL ENGINEERING DEPT.

L T P C 3 1 0 3

ELEMENTS OF CIVIL ENGINEERING (OE)

Course Objectives

- To study types of different building materials and its testing
- To understand the soil and its significance in construction techniques as an engineering material
- To study various surveying techniques
- To study the concept of strength characteristics of the building

Course Outcomes

- The students will be able to understand the concept of different building byelaws and planning principles
- Students can develop an understanding on Geotechnical aspect of civil engineering
- The students will be able to develop linear programming models for water resources problems by using graphical and simplex and revised simplex techniques
- Students can develop and solve forward and backward recursive dynamic programming models.

<u>Content</u>

UNIT – I

Basics of Geotechnical engineering and engineering geology

Engineering Geology: Geology - branches of geology - weathering of rocks – definition - importance of study of minerals - classification of minerals - petrology-geological classification of rocks.

Geotechnical engineering: Soil formation- Soil structure - types of soils and its properties-soil mineralogy and its significance.

UNIT – II

Building materials, building components:

Stones – Classification, quarrying and methods of quarrying. Bricks – Components of Brick earth. Building Components – Lintels, arches, walls, staircase, floor and roofs, doors and windows, DPC, principles of Building planning and building byelaws

UNIT – III

Basic concepts of strength of materials and fluid mechanics

Strength of materials: Types of stresses and strains - hook's law - definition of the beam - types of beams – types of loads, concept of bending moment and shear for with simply supported beam. **Fluid mechanics:** Dimensions and units - physical properties of fluids – specific gravity - surface tension – viscosity - vapor pressure.

UNIT – IV Basic concepts of concrete technology and surveying

Cement: Chemical composition - aggregates - classification of aggregates. **Admixtures:** Types of admixtures- water cement ratio. **Surveying:** Definition of surveying - principle - types of surveying - objectives and classification -advanced surveying - GIS - GPS.

UNIT – V Transportation engineering

Highway Development in India – Necessity for Highway Planning- Different Road Development Plans; Classification of Roads - Road Network Patterns, Types of Intersections – Conflicts at Intersections – Introduction to flexible & rigid pavements – advantages – limitations. Parking studies- road accidents and preventive measurestraffic signs- road markings.

Textbooks

- Building Construction by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain Laxmi Publications (P) Itd., 10thed. 2008
- Geotechnical Engineering, (3rd edition) by Venkataramiah, C., New Age International Pvt . Ltd, 2010.
- 3. Engineering Geology by N.Chennakesavulu, Mc-Millan, India Ltd. 2005
- 4. Strength of Materials by S.S.Bhavikatti, Vikas Publishing House Pvt. Ltd. 2008
- 5. Text book of surveying by C.Venkataramaiah, Universities Press 2006
- Concrete Technology by M.L. Gambhir. Tata Mc. Graw Hill Publishers, New Delhi 5th ed 2004.
- Principles and Practices of Highway Engineering Dr.L.R.Kadiyali and Dr.N.BLal -Khanna Publications. (2005).

References

- 1. Concrete Technology by A.R. Santha Kumar, Oxford university Press, New Delhi 2006
- Highway Engineering S.K.Khanna & C.E.G.Justo, Nemchand & Bros., 7th edition (2000).
- Basic and Applied Soil Mechanics by Gopal Ranjan & ASR Rao, New age International Pvt. Ltd, New Delhi: ,third edition (2016)
- Fluid Mechanics, Hydraulic and Hydraulic Machines by Modi & Seth, Standard book house. 3rd ed. 2009.

L	Т	Ρ	С
3	1	0	3

INTRODUCTION TO EARTHQUAKE ENGINEERING (OE)

Objectives

- To introduce the basic knowledge on earthquake engineering
- To introduce the aspects of the earthquake with the view of plate tectonics
- To develop the understanding of earthquake and its causes through the theory of vibrations
- The course introduces the source mechanics of earthquake, hazards and its consequences and also covers earthquake measurement and instrumentation

Outcomes

- The students will be able to quantify different earthquake hazards and its effects.
- The students can classify the different waves in earthquake events.
- Students will be able to understand the hazard and its significance in earthquake engineering.
- Students can understand the basics of dynamics during earthquake events in terms of vibrations.

Content

<u>UNIT I</u>

Introduction to Earthquakes: Definition of Tectonic plates, fault types, earthquake classification, Fundamentals of wave motion- seismic wave types. Reflection and refraction of plane waves at a plane boundary- independence of SH and P and of SV waves- boundary conditions; Energy conversions focus on Indian earthquakes.

UNIT II

Earthquake measurements: Earthquake measuring: instruments-Seism scope, Seismograph, Seismic Recording, accelerograph-strong ground motions- Interpretation of Seismic Records - acceleration, velocity and displacement; Frequency and Time Domain parameters: Seismic zones of India.

UNIT III

Engineering Seismology: Earthquakes phenomenon cause of earthquakes-Stress, Strain, & Seismic Waves Faults- theory of Plate tectonics- Different plate theories-Big bang theory Seismic waves- Terms associated with earthquakes-Magnitude/Intensity of an earthquake-scales-Energy released. Wave equation (1-D propagation).

UNIT IV

Seismic Hazard: Safety of individual site; Concept of seismic microzonation. Need for Microzonation, Introduction to Seismic Hazard, types of hazard, Time parameters of hazards, introduction to Hazard analysis Methods-Deterministic and Probabilistic-Introduction to Site characterization; Concept of site response- Local site effects and evaluation methods.

<u>UNIT V</u>

Theory of Vibrations: Elements of a vibratory system- Degrees of Freedom-Continuous System-Lumped mass idealization-Oscillatory Motion-Simple Harmonic Motion-Free vibration of single degree of freedom (SDOF) system with and without damping. **Concepts of Earthquake resistant building:** Building configurations -Introduction-Functional Planning-Continuous load path- Dynamic Characteristics of Buildings.

<u>Textbooks</u>

- 1. Basic Earthquake Engineering: From Seismology to Analysis and Design: Sinan Akkar (2014).
- 2. Dynamics of Structures: Applications to Earthquake Engineering: A K Chopra (2003)
- 3. Earthquake Resistant Design of structures Pankaj Agarwal and Manish Shrikhande, Prentice Hall of India Pvt. Ltd, (2006).

<u>References</u>

- Seismic Design of Reinforced Concrete and Masonry Building T. Paulay and M.J.N. Priestly, John Wiley & Sons (1994).
- 2. Earthquake Resistant Design of Building structures by Vinod Hosur, Wiley India Pvt. Ltd (1992).
- Elements of Mechanical Vibration by R.N.Iyengar, I.K. International Publishing House Pvt. Ltd, (2010).
- Masory and Timber structures including earthquake Resistant Design Anand S.Arya, Nem chand & Bros, (1992).
- 5. Earthquake Tips Learning Earthquake Design and Construction C.V.R. Murthy, (2005)

OPEN ELECTIVES OFFERED BY CSE/ IT DEPTS.

L T P C 3 1 0 3

INFORMATION SYSTEMS FOR ENGINEERS (OPEN ELECTIVE-3)

Course Outcomes: At the end of this course, the student would be able to

- 1. Understand the basic concepts of Information Systems
- 2. Explain the System analysis and System design
- 3. Analyze Data base information management system
- 4. Understand Security issues in information system
- 5. Understand the ethical issues in information systems.

UNIT I – INTRODUCTION

Introduction to Information Technology - Need for information technology; Information Systems: Concepts and overview of information systems; Systematic framework for information systems; Components of information Systems.

UNIT II - SYSTEMS ANALYSIS AND DESIGN

System Analysis :System and system concepts, classification of information System, SDLC framework.

System Design-Deterministic System and Probabilistic System, Basic elements of business organization, Business system and objectives.

UNIT III – DATABASES AND INFORMATION MANAGEMENT

Database Management Systems for information Systems: File Organization concepts, Database Management systems, capabilities of DBMS, Database Design, Challenges of Big Data.

UNIT IV - SECURITY IN INFORMATION SYSTEMS

Information Systems Security –System Vulnerability and abuse – improve Business value of security & control using various technologies – framework security and control –recent technologies and tools for protecting information resources.

UNIT V - ETHICS IN INFORMATION SYSTEMS

Ethical and Social Issues in Information Systems – ethics in an information society – moral dimensions of Information Systems – role of Government in information technology.

TEXT BOOKS:

1. Kenneth C. Laudon & Jane P.Laudon, "Management Information Systems" Managing the Digital Firm-Twelfth Edition, Pearson.

2. Gerald V.Post David L. Anderson, "Management Information System-Solving Business Problems with Information Technology" Tata McGraw Hill Publishing Co. Itd, New Delhi **REFERENCES**:

1. Management Information Systems by CSV Murthy, HIM publishers

2. Raymond Meleod, JR "Information Systems" Mac Millan Publishing Co. Itd4th Edition.

L T P C 3 1 0 3

WEB DESIGN

Course Outcomes: At the end of this course, the student would be able to

- 1. List the HTML tags
- 2. Understand different style sheets.
- 3. Explain the client-side scripting through JavaScript
- 4. Examine the server-side scripting language through PHP
- 5. Examine the server-side programming using JSP

UNIT-I

Introduction

HTML basics tags - LIST – unordered list – nested and ordered list – Basic HTML Tables – Intermediate HTML table and Formatting – basic HTML Forms and Formatting –More Complex HTML Forms – Frames -Frameset Element – Nested Frameset, page layout and navigation.

UNIT-II

CSS

Style Sheets: Introduction to Style sheets – Formatting Text by Using Style Sheets – Formatting Paragraphs by Using Style Sheets

UNIT-III

Client-Side Scripting

JavaScript language- Declaring variables, scope of the variables, functions, Objects in Java Script, Dynamic HTML with Java Script, Form validation.

UNIT-IV

Introduction to PHP

Variable Declaration, data types, arrays, strings, operators, expressions, control structures, functions, reading data from web form controls like text boxes, radio buttons, lists etc.

File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. binary files, listing directories.

Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.

UNIT-V

Introduction to JSP:

The Anatomy of a JSP Page; JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

TEXT BOOKS

- 1. Faithe Wempen," Microsoft Step by Step HTML and XH", Prentice Hall of India Private Limited, New Delhi, 2011.
- 2. The complete reference –PHP by Steven Holzner.

REFERENCES

- 1. Achyut S Godbole & Atul Kahate, "WEB TECHNOLOGIES TCP/IP to Internet Applications Architectures", TMH 2007.
- 2. Thomas A. Powell, McGraw-Hill "HTML & CSS: The Complete Reference", Fifth Edition (Complete Reference Series) Osborne Media; 5 edition, 2010.
- 3. Java Server Pages -Hans Bergsten, SPD O'Reilly.

OPEN ELECTIVES OFFERED BY ECE DEPT.

L T P C 4 0 0 3

INTRODUCTION TO MATLAB

Pre-Requisites:

• Programming in C

Course objectives:

In this course it is aimed to introduce to the students with

- To enable the students to understand the fundamentals and programming knowledge in MATLAB.
- To provide the deeper understanding of the tools and processes that enable students to use MATLAB for the engineering problems.
- To assist the students with computational tools to design their own analysis and interpretation strategies when facing different engineering applications.

Course Outcomes:

- 1. At the end of the course the student should be able to
- 2. Break down computational problems into a series of simple steps.
- 3. Create programs in the MATLAB language for engineering applications.
- 4. Appraise and get familiarized with the visualization techniques.
- 5. Familiarized with Different application tools required for different area of domain.
- 6. Expose to the common algorithms and techniques that are the building blocks of MATLAB.

UNIT-I

Introduction to Matlab

Introduction-environment-Advantages – file types –Variables and Constants –Vectors and Matrices- Arrays - manipulation- Built-in MATLAB Functions – Load and Save – Matlab File Processing-File Opening and Closing –Input and output statements-Function files.

UNIT- II

Control Structures in MATLAB: Data Types-Operators – Hierarchy of operations-Loops- for - nested for - while –Branching structures- If- switch- break- continue- errortry-catch-Debugging methods in Matlab.

UNIT-III

Matlab Plotting: Basic 2D plots: Printing labels- grid and axes box- Entering text in a box- Axis control-Style Options-Multiple plots-subplots-specialized 2D plots- STEM-BAR- HIST- Pi- stairs- rose- LOG-LOG- SEMILOG-POLAR-COMET- 3D plots: – Mesh - Contour –Surf-Stem3.

UNIT- IV

Matlab Programming: Nodal analysis-loop analysis- Laplace transform- inverse Laplace transform- partial fraction expansion- transfer function representation –zeros and poles–roots-polyval-residue- Time response of control system-ordinary differential equation-ODE solver-Polynomials.

UNIT-V

Introduction to Simulink: Introduction-simulink modeling-simulating a model-using variable from matlab-Data import and export-State space modeling-Simulation of nonlinear system-Creating a sub system-Creating a masked sub system- Introduction-Creating and displaying GUI-GUI components-Panel and button groups-Dialogue boxes and button groups-menus-Creating efficient GUIS.

TEXT BOOKS

- 1. Stephen J. Chapman-"MATLAB Programming for Engineers"- 5th Edition-Cengage Learning- 2015.
- 2. R.K.Bansal- A.K.Goe- M.K.Sharma- "MATLAB and Its Applications in Engineering"- Pearson Education India- 2009.

REFERENCES

- 1. Amos Gilat-"MATLAB: An Introduction with Applications"- John Wiley & Sons-2009.
- Edward B. Magrab-"An Engineer's Guide to MATLAB: With Applications from Mechanical- Aerospace-Electrical- Civil- and Biological Systems Engineering"-3rd Edition- Prentice Hall-2011.
- 3. Rudra Pratap- "Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers"-Oxford University Press- 2010.
- 4. D. M. Etter- "Introduction to MATLAB 7"- Pearson education-2009.
- William J.Palm III- "Introduction to MATLAB for Engineers"- 3 rd Edition-McGraw-Hill-2010.
- 6. M.Herniter- "Programming in MATLAB"- Thomson Learning- 2001.

CIRCUIT SIMULATION USING PSPICE

Pre-Requisites

Basic Electrical and Electronics

Course objectives:

In this course it is aimed to introduce to the students with

- To develop a simulation circuit for different domain.
- To Develop and understand the types of the Pspice
- To Perform the DC analysis of the circuit such as operating point small signal transfer function and DC sweep.
- To motivate the students to analyze the frequency response of the circuit.

Course Outcomes:

At the end of the course the student should be able to

- 1. Describe circuits for PSpice simulation.
- 2. Understand the types of dc ac and their output variables analysis
- 3. Understand the response of Transient analysis and obtain their output variables.
- 4. Students can able to analyze and develop simulation circuit for different applications.

UNIT-I

Introduction to Pspice

Introduction-Description of Spice-Types- input files-Element values-Nodes-Circuit Elements-Sources-Types of Analysis-Output Variables-Pspice Output Commands – structure of Pspice programs-Limitations of Pspice--Examples.

UNIT-II

DC Circuit Analysis

Introduction-Resistors-Operating Temperature-Modeling of Elements-Independent DC Sources-Dependent Sources-D C Output Variables-Example Problems-Types of Output-Types of DC Analysis-Finding the thevenin's equivalent-transfer function-DC transfer characteristics with varying resistors.

UNIT-III

Transient Analysis

Introduction- AC Output Variables- Capacitors and Inductors- Modeling of Transient Sources-transient source-transient output commands-Transient response-switches-Example.

UNIT-IV

AC Circuit Analysis: Introduction- AC Output Variables - Independent AC Sources-AC analysis- Magnetic Elements - Transmission Lines- Multiple Analyses – Examples.

Advanced Pspice Commands: Table- Laplace – freq – ends - PARAM-Fourier analysis-Noise analysis-Subckt.

UNIT-V

Application of Pspice: Introduction- Pspice model for -Diode- BJT-FET and MOSFET - VI characteristics of Diode-zener diode-CB-CC-CE characteristics-Drain - Transfer characteristics- Introduction to Orcad capture.

TEXT BOOKS

- 1. Muhammad H. Rashid- Introduction to PSpice® Using OrCAD® for Circuits and Electronics- third edition-Pearson 2004.
- 2. Paul W. Tuinenga-A guide to circuit simulation and analysis using spice-Pearson Education-1995.

REFERENCES

- 1. Nillson Introduction to PSpice Using OrCad Release 16.2: Electric Circuits 9th Edition -2011.
- 2. L. H. Fenical- PSpice@: A Tutorial-Prentice Hall- Prentice Hall -1992.
- 3. John O Attia Pspice and Matlab for Electronics CRC Publication 2002.
- 4. James W.Nilson Introduction to PSpice for Electric Circuits Aug 2007.
- James A.svaboda Wiley PSpice for Linear Circuits (uses PSpice version 15.7) 2nd Edition.

OPEN ELECTIVES OFFERED BY EEE DEPT.

L T P C 3 1 0 3

ELECTRIC VEHICLES AND HYBRID VEHICLES

Course Objectives:

- To understand working of different configurations of electric vehicles, and its components.
- To understand hybrid vehicle configuration and performance analysis.

Course Outcomes: After this course, the student will

- Understand the working of different configurations of electric vehicles, and its components.
- Understand Hybrid Vehicle configuration and its components
- Be able to analyze the performance of hybrid vehicles.

UNIT-I

Electric Vehicles

Introduction to Electric Vehicles - Components - vehicle mechanics - Roadway fundamentals - vehicle kinetics - Dynamics of vehicle motion - Propulsion System Design.

UNIT-II

Batteries

Basics - Types - Parameters - Capacity - Discharge rate - State of charge - state of Discharge - Depth of Discharge - Technical characteristics - Battery pack Design -Properties of Batteries.

Fuel Cells - Types - Fuel Cell Electric Vehicle.

UNIT-III

DC & AC Electrical Machines

(Basics of Principle of Operation Only)

Motor and Engine rating – Requirements - DC machines - Three phase A/c machines - Induction machines - Permanent Magnet Machines, Switched Reluctance Machines.

UNIT-IV

Electric Vehicle Drive Train

Transmission configuration-Components - gears, differential, clutch, brakes regenerative braking- motor sizing- Gear Ratio–Torque speed characteristics - EV Motor Sizing Initial Acceleration-Rated Vehicle Velocity- Maximum Velocity-Maximum Grade ability.

UNIT-V

Hybrid Electric Vehicles

Types of Hybrid Vehicles - series and parallel Hybrid Electric Vehicles, series- parallel configuration - Internal Combustion Engines - Reciprocating Engines - Practical and Air-Standard Cycles - Air-Standard Otto Cycle - Air-Standard Diesel Cycle - Example IC Engines in HEVs - Design - Drive train - sizing of components.

TEXT BOOKS:

- 1. Iqbal Hussain, "Electric & Hybrid Vehicles Design Fundamentals", Second Edition, CRC Press, 2011.
- 2. James Larminie, "Electric Vehicle Technology Explained", John Wiley & Sons, 2003.

REFERENCE BOOKS:

- 1. Mehrdad Ehsani, Yimin Gao, Ali Emadi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals", CRC Press, 2010.
- 2. Sandeep Dhameja, "Electric Vehicle Battery Systems", Newnes, 2001

L	Т	Ρ	С
3	1	0	3

ENERGY STORAGE SYSTEMS

Pre-requisite: None

Course Objectives: Objective of this course is

 To enable the student to understand the need for energy storage, devices and technologies available and their applications.

Course Outcomes:

After this course, the student

- Can analyze the characteristics of energy from various sources and need for storage
- Can classify various types of energy storage and various devices used for the purpose
- Can apply the same concepts to real time problems.

UNIT-I

Electrical Energy Storage Technologies

Characteristics of electricity - The roles of Electric Energy Storage - High generation cost during peak- demand periods - Need for continuous and flexible supply - Long distance between generation and consumption- Congestion in power grids - Transmission by cable.

UNIT-II

Needs for Electrical Energy Storage

Emerging needs for Electric Energy Storage – Utilization of more renewable energy less fossil fuel - Smart Grid uses - The roles of electrical energy storage technologies -The roles from the viewpoint of a utility, from the viewpoint of consumers, from the viewpoint of generators of renewable energy.

UNIT-III

Features of Energy Storage Systems

Classification of Electric Energy Storage systems - Mechanical storage systems -Pumped hydro storage (PHS) - Compressed air energy storage (CAES) - Flywheel energy storage (FES) - Electrochemical storage systems - Secondary batteries - Flow batteries - Chemical energy storage, -Hydrogen (H2) - Synthetic natural gas (SNG).

UNIT-IV

Types of Electrical Energy Storage systems

Electrical storage systems - Double-layer capacitors (DLC) - Superconducting magnetic energy storage (SMES) - Thermal storage systems - Standards for Electric Energy Storage - Technical comparison of EES technologies.

UNIT-V

Applications

Present status of applications - Utility use (conventional power generation, grid operation & service) - Consumer use (uninterruptable power supply for large consumers) - New trends in applications - Renewable energy generation - Smart Grid - Smart Micro grid, Smart House - Electric vehicles - Management and control hierarchy of storage systems - Internal configuration of battery storage systems - External connection of EES systems - Aggregating EES systems and distributed generation (Virtual Power Plant) - Battery SCADA - Aggregation of many dispersed batteries.

TEXT BOOKS:

- 1. Energy Storage Benefits and Market Analysis' by James M. Eyer, Joseph J. lannucci and Garth P. Corey.
- 2. The Electrical Energy Storage by IEC Market Strategy Board.

REFERENCE BOOKS: Jim Eyer, Garth Corey: Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide, Report, Jim Eyer, Garth Corey, Sandia National Laboratories, Feb 2010.

OPEN ELECTIVES OFFERED BY MECH DEPT.

L	т	Р	С
3	1	0	3

OPTIMIZATION TECHNIQUES

Course Objectives

- To familiarize with the quantitative tools and techniques, which are frequently applied to business decision-making of real systems.
- To analyze which scientific approach is chosen in timely management decisions for the purpose of improving its performance.
- To develop problem modelling and solving skills and learn how to make intelligent business decisions by optimizing the resources.
- To provide a formal quantitative approaches in problem solving and acquire substantial experience in taking corrective measures.

Course Outcomes

- To Model the real life situations with mathematical models.
- To Understand the concept of linear programming.
- To Solve transportation and assignment problems.
- To Formulate the sequencing of jobs on machines.
- To Understand the various replacement concepts.
- To Identify and apply various inventory models.
- To Apply queuing and dynamic programming models.

UNIT – I

Introduction

Development – Definition – Characteristics and phases – Types of operation Research models – applications. Allocation:

Linear Programming Method

Problem formulation – Graphical solution – Simplex method – Artificial variables Techniques – Two – phase method, Big-M method – Duality principle.

UNIT – II

Transportation Problem

Formulation–Optimal solution–unbalanced transportation problem–Degeneracy, Assignment problem–Formulation–Optimal solution–Variants of Assignment Problem– Travelling salesman problem.

UNIT – III

Theory of Games

Introduction – Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Rectangular games without saddle points – dominance principle – m X 2 & 2 X n games – graphical method.

Waiting Lines

Introduction – Single Channel – Poisson arrivals exponential service times – with infinite population and finite population models – Multichannel – Poisson arrivals – exponential service times with infinite population single channel Poisson arrivals.

UNIT – IV SEQUENCING

Introduction — Flow — Shop sequencing — n jobs through two machines — n jobs through three machines — Job shop sequencing — two jobs through 'm' machines.

Replacement

Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely, group replacement.

Inventory

Introduction – Single item – Deterministic models – Purchase inventory models with one price break and multiple price breaks – shortages are not allowed – Stochastic models – demand may be discrete variable or continuous variable – instantaneous production, instantaneous demand and continuous demand and no set up cost – Single period model.

UNIT – V

Dynamic Programming

Introduction – Terminology – Bellman's Principle of optimality – Applications of dynamic programming – shortest path problem – linear programming problem.

Simulation

Definition – Types of simulation models – phases of simulation – applications of simulation – inventory and Queuing problems – Advantages and Disadvantages – Brief introduction of simulation languages.

TEXT BOOKS:

- 1. "Operations Research" S.D.Sharma, , Kedarnath, Ramnath & Co., Meerut, 2009.
- 2. "Operations Research" / J.K . Sharma 5e / Macmillan Fifth edition-2012.
- 3. "Operations Research" / R.Pannerselvam 2e, PHI Publications Second edition-2006.

REFERENCE BOOKS:

- 1. "Operations Research"/ A.M. Natarajan, P.Balasubramani, A.Tamilarasi / Pearson Education-2012.
- "Operations Research: Methods & Problems" / Maurice Saseini, Arhur Yaspan & Lawrence Friedman / Literary Licensing- 2013.
- "Operations Research-An Introduction", Hamdy, A.Taha, Eighth Edition, Prentice Hall of India Pvt. Ltd., 1997.

L	Т	Ρ	С
3	1	0	3

MAINTENANCE AND SAFETY ENGINEERING

Course Objectives

- To understand the need for maintenance and safety in industry and organizations by following the scientific principles.
- To Condition monitoring, preventive maintenance and breakdown maintenance issues are analyzed in order to improve the overall availability of the infrastructure by considering the reliability concepts.

Course Outcomes

- Maintenance concepts in the light of the overall utilization and availability of the machines in the industry are analyzed.
- Reliability and the breakdown phenomena of each equipment studied such that preventive maintenance can be scheduled.

UNIT – I

Introduction

Need for Maintenance, Facts and Figures, Modern Maintenance, Problem and Maintenance strategy for the 21st Century Engineering Maintenance Objectives and Maintenance in Equipment Life cycle, Terms and Definitions.

Maintenance Management and Control

Maintenance Manual Maintenance, Facility Evaluation Functions of Effective Maintenance Management, Maintenance Project Control Methods, Maintenance Management Control indices.

UNIT – II

Types of Maintenance

Preventive Maintenance, Elements of Preventive, Maintenance Program, Establishing Preventive Maintenance Program, PM Program Evaluation and improvement, PM Measures, PM Models, Corrective Maintenance, Corrective Maintenance Types, Corrective Maintenance Steps and Downtime Components, Corrective Maintenance Measures, Corrective Maintenance Models.

UNIT – III

Inventory Control in Maintenance

Inventory Control Objectives and Basic inventory Decisions, ABC inventory Control Models Two – Bin inventory Control and Safety Stock, spares Determination Factors spares calculation methods.

UNIT – IV

Quality and Safety in Maintenance

Needs for Quality Maintenance Processes, Maintenance Work Quality, Use of Quality Control Charts in Maintenance Work Sampling, Post Maintenance Testing, Reasons for Safety Problems in Maintenance, Guidelines to improve Safety in Maintenance Work, Safety Officer's Role in Maintenance Work, Protection of Maintenance Workers.

Maintenance Costing

Reasons for Maintenance Costing, Maintenance Budget Preparation Methods and steps, Maintenance Labor Cost Estimation, Material Cost Estimation, Equipment Life Cycle Maintenance Cost Estimation, Maintenance Cost Estimation Models.

UNIT – V

Reliability, Reliability Centered Maintenance, RCM

Goals and Principles, RCM Process and Associated Questions, RCM Program Components Effectiveness Measurement indicators, RCM Benefits and Reasons for its Failures, Reliability Versus Maintenance and Reliability Measures and Formulas, Reliability Networks, Reliability Analysis Techniques.

Maintainability

Maintainability importance and Objective, Maintainability in Systems Life Cycle, Maintainability Design Characteristics, Maintainability Functions and Measures, Common Maintainability Design Errors.

TEXT BOOKS

- 1. Reliability, Maintenance and Safety Engineering by Dr. A.K Guptha/ Laxmi Publications-First edition -2015.
- 2. Industrial Safety Management by L.M. Deshmukh / TMH-2008.

REFERENCES

- 1. Maintenance Engineering & Management by R.C. Mishra/ PHI-Second edition-2012.
- 2. Engineering Maintenance a modern approach, B.S. Dhallon, C.R.R Publishers 2002.

OPEN ELECTIVES OFFERED BY MBA DEPT.

FUNDAMENTALS OF ENTREPRENEURSHIP

B. Tech IV Year I SEM

Course Objectives: To enable the student to understand, with a practical insight,

- 1. To provide awareness about entrepreneurship
- 2. To develop idea generation, creative and innovative skills among students
- 3. To self-motivate the students by making aware of different opportunities by exploring themselves by discussing successful growth/failure stories
- 4. To learn to start an enterprise and design business plans those are suitable for funding by considering all dimensions of business.

UNIT I - INTRODUCTION TO ENTREPRENEURSHIP

Entrepreneur; Role of Entrepreneur, Characteristics and Qualities of an Entrepreneur; Entrepreneurs Vs Intrapreneurs and Managers; Classification of Entrepreneurs; Factors Influencing Entrepreneurship; Entrepreneurial Environment; Entrepreneurial Growth; Problems and Challenges of Entrepreneurs; Entrepreneurial Scenario in India.

UNIT II - MICRO, SMALL AND MEDIUM ENTERPRISES (MSMES)

MSMEs – Definition and Significance in Indian Economy; MSME Schemes, Challenges and Difficulties in availing MSME Schemes, Forms of Business; Women Entrepreneurship; Rural Entrepreneurship; Family Business and First-Generation Entrepreneurs.

UNIT III - IDEA GENERATION AND FEASIBILITY ANALYSIS

Idea Generation; Creativity and Innovation; Identification of Business Opportunities; Market Entry Strategies; Marketing Feasibility; Financial Feasibilities; Political Feasibilities; Economic Feasibility; Social and Legal Feasibilities; Technical Feasibilities; Managerial Feasibility, Location and Other Utilities Feasibilities.

UNIT IV - BUSINESS PLANNING

Business Planning – Meaning, designing, analyzing and improvising; Business Plan – Meaning, Scope and Need; Financial, Marketing, Human Resource and Production/Service Plan; Business plan Formats; Project report preparation and presentation; Reasons for failure of a business plan.

UNIT V - FINANCING AND START UP BUSINESS

Financial opportunity identification; Banking sources; Non-banking Institutions and Agencies; Venture Capital – Meaning and Role in Entrepreneurship; Government Schemes for funding business; Pre-launch, Launch and Post launch requirements; Procedure for getting License and Registration; Challenges and Difficulties in Starting an Enterprise, Makers Space, T-Hub, Make in India.

Text Books:

- 1. Jayshree Suresh, "Entrepreneurial Development", Margham Publishers, Chennai, 2011
- 2. Poornima M Charantimath, "Entrepreneurship development small business enterprises", Pearson, 2013. 169.

References:

- Raj Shankar, "Entrepreneurship: Theory and Practice", Vijay Nicole imprints Itd in collaboration with Tata Mc-graw Hill Publishing Co.ltd. new Delhi, 2012.
- Robert D. Hisrich, Mathew J. Manimala, Michael P Peters and Dean A. Shepherd, "Entrepreneurship", 8th Edition, Tata Mc-graw Hill Publishing Co.ltd. new Delhi, 2012.
- 3. Martin Roger, "The Design of Business", Harvard Business Publishing, 2009.
- 4. Roy Rajiv, "Entrepreneurship", Oxford University Press, 2011.
- 5. Drucker.F, Peter, "Innovation and Entrepreneurship", Harper business, 2006.

Outcome: At the end of the course the students is expected

- 1. To design suitable business plans.
- 2. To stimulate self-motivation to start an enterprise.