

**NOOURL ISLAM CENTRE FOR HIGHER EDUCATION**

**NOORUL ISLAM UNIVERSITY, KUMARACOIL**

**B.TECH. INFORMATION TECHNOLOGY**

**CURRICULUM & SYLLABUS**

**SEMESTER I**

*(Common for All B.E/B.Tech. Programmes Except Marine Engineering)*

<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>THEORY</b>						
1.	EG1101	Technical English – I	3	1	0	4
2.	MA1101	Engineering Mathematics – I	3	1	0	4
3.	PH1101	Engineering Physics – I	3	0	0	3
4.	CH1101	Engineering Chemistry - I	3	0	0	3
5.	ME1101	Engineering Graphics	3	0	0	3
6.	CS1101	Fundamentals of Computing and Programming	3	0	0	3
<b>PRACTICAL</b>						
7.	CS1171	Computer Practice Lab - I	0	1	2	2
8.	ME1171	Computer Aided Drafting and Modeling Lab	0	1	2	2
9.	PH1171	Physics Lab – I	0	0	2	1
10.	CH1171	Chemistry Lab - I	0	0	2	1
<b>TOTAL</b>			<b>18</b>	<b>4</b>	<b>8</b>	<b>26</b>

**\* Those who have admitted from the Academic Year 2013-2014 onwards**

**EG1101**

**TECHNICAL ENGLISH – I**

**3 1 0 4**

**UNIT-I**

**9**

Verb-Tenses -12 Tenses-8 Passive Forms- Word formation with prefixes and suffixes

**UNIT-II**

**9**

Expansion of Compound Nouns – Punctuation - Definitions of Technical Terms - Changing words from one form to another - Imperatives and Instructions - Conditional clauses.

**UNIT-III**

**9**

Interrogatives and Question Tags - Asking Questions - Comprehension – Discourse Markers

**UNIT –IV**

**9**

Concord - Identifying Common Errors - Cause and Effect Expressions – Paragraph Writing – Copy Writing: Slogans and Captions - Writing Instructions - Letter Writing (Formal Letters)

**UNIT –V**

**9**

Creative Writing – Transcoding: Bar Chart, Flow Chart - Pie Chart - Tree Diagram - Tabular Column

**L: 45 + T: 15, TOTAL: 60 PERIODS**

**TEXT BOOK:**

Department of Humanities and Social Sciences, Anna University, English for Engineers and Technologists, Combined Edition (Volumes 1 @ 2), Chennai: Orient Black Swan Pvt.Ltd.,2006 Themes 1-4 (Resources, Energy, Computer, Transport)

**EXTENSIVE READING:**

A.P.J.Abdul Kalam with Arun Tiwari, Wings of Fire: An Autobiography, University Press (India) Pvt.Ltd, 1999, 30 Impression 2007

**NOTE:**

The book given under Extensive Reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.

**MA1101**

**ENGINEERING MATHEMATICS - I**

**3 1 0 4**

**AIM:**

To impart the fundamental knowledge of Engineering Mathematics to the students in order to achieve a well founded knowledge about the principles of Mathematics.

**OBJECTIVE:**

The course objective is to develop the required skill of the students in the area of

Engineering Mathematics with special emphasis on the characteristic equation of matrices, differential calculus, Beta and Gamma functions and to develop basic knowledge to the students in double and triple integration.

**UNIT I MATRICES 9**

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of eigen values and eigen vectors(without proof)– Cayley Hamilton theorem (statement only), verification and its applications – Orthogonal and Symmetric matrices and their properties(excluding proof)- Orthogonal transformation of a symmetric matrix to diagonal form.

**UNIT II DIFFERENTIAL CALCULUS 9**

Curvature – Cartesian co-ordinates and parametric form -Centre and radius of curvature, Circle of curvature – Evolutes.

**UNIT III FUNCTIONS OF SEVERAL VARIABLES 9**

Partial derivatives – Total derivatives – Jacobians – Properties – Maxima and minima for functions of two variables–Lagrange Multiplier method- Taylor’s expansion.

**UNIT IV BETA AND GAMMA INTEGRALS 9**

Evaluation of improper integrals- Beta and Gamma functions – Properties – Relation between Beta and Gamma functions - Evaluation of integrals using Beta and Gamma functions.

**UNIT V MULTIPLE INTEGRALS 9**

Evaluation of double and triple integrals – Area as double integral in cartesian and polar co-ordinates– Change of order of integration- Transformation of Cartesian coordinates into polar coordinates.

**L: 45 + T: 15, TOTAL: 60 PERIODS**

**TEXT BOOK:**

Grewal B.S., “Higher Engineering Mathematics”- 40<sup>th</sup> Edition , Khanna Publishers, Delhi 2007.

**REFERENCES:**

- 1 Veerarajan T, “ Engineering Mathematics (for first year)”, Tata McGraw- Hill Publishing Company Ltd.,New Delhi , 2007
- 2 Erwin Kreyszig, “ Advanced Engineering Mathematics”, 7<sup>th</sup> Edition, Wiley India, 2007.
- 3 P.Kandasamy , K.Thilagavathy , K.Gunavathy” Engineering Mathematics” Vol,1 S.Chand & Company Ltd.2002
4. B.V. Ramana,”Higher Engineering Mathematics” Tata McGraw- Hill, Publishing Company Ltd.,New Delhi, 2006

**AIM:**

To provide a sound knowledge on the principles of Physics and its practical applications in various areas of Engineering and Technology.

**OBJECTIVE:**

At the end of the course students would be exposed to

- The mechanical properties of matter and its engineering applications
- Application of ultrasonics in Industry and Medical field
- The important properties of light and their application
- Application of laser and fiber optics in communication and technology
- The fundamentals of heat- energy conversion and its application.

**UNIT I Properties of matter****9**

Elasticity – Poisson’s ratio – Stress-strain diagram – factors affecting elasticity – bending of beams – cantilever – bending moment – theory and experiment of Young’s modulus determination – Uniform and non-uniform bending – I shaped girders – twisting couple – hollow cylinder – shaft – torsion pendulum – determination of rigidity modulus

**UNIT - II Ultrasonics****9**

Introduction-production of ultrasonic waves- magnetostriction effect- magnetostriction generator-piezoelectric effect-piezoelectric generator-detection of ultrasonic waves-properties - velocity measurement - acoustic grating-industrial applications-drilling, welding, soldering and cleaning- SONAR- non destructive testing pulse echo system-medical applications-sonograms.

**UNIT –II Optics****9**

Interference: air wedge- theory and experiment-testing of flat surfaces- Michelson’s Interferometer-types of fringes- applications (determination of wavelength and thickness of thin transparent medium).

Polarization: Introduction- double refraction, quarter and half wave plates- production of plane, circularly and elliptically polarized light-detection of plane, circularly & elliptically polarized light.

Photoelasticity- Stress-optic law- photoelastic bench

**UNIT- IV Lasers & Fiber Optics****9**

Introduction- principle of spontaneous emission and stimulated emission, Einsteins A and B coefficients-derivation- population inversion, pumping, types of lasers- Nd-YAG, CO<sub>2</sub>- applications.

Principle and propagation of light in optical fibre- numerical aperture and acceptance angle- types of optical fibres (material, refractive index, mode)- double crucible technique of fibre drawing, fibre optic communication system (Block diagram)-fibreoptic sensors.

**UNIT – V Heat and Thermodynamics****9**

Thermal conductivity- Forbe's and Lee's disc methods-radial flow of heat- thermal conductivity of rubber and glass-thermal insulation in buildings - Laws of thermodynamics- Carnot's cycle as heat engine – efficiency, Otto engine & Diesel engine (qualitative).

**TOTAL: 45 PERIODS****TEXT BOOKS:**

1. R.K. Gaur and S.L.Gupta, 'Engineering Physics' Dhanpat Rai publications, New Delhi.
2. Marikani A, 'Engineering Physics' PHI learning pvt ltd, III Edition, New Delhi.
3. Palanisamy.P.K., 'Engineering Physics' Scitech publications, Chennai.
4. M.N. Avadhanulu and PG Kshirsagar. ' A Text book of Engineering Physics', S.Chand and company, Ltd., New Delhi.

**REFERENCES:**

1. Serway and Jewett, 'Physics for Scientists and Engineers with Modern Physics', 6th Edition, Thomson Brooks/Cole, Indian reprint.
2. Brijlal and Subrahmanyam 'Heat and Thermodynamics' S. Chand , Limited.
3. Ajoy Ghatak, ' Optics' Tata McGraw Hill Publications, New Delhi.
4. Brijlal and Subrahmanyam 'Properties of Matter' S. Chand , Limited.

**CH1101****ENGINEERING CHEMISTRY-I****3 0 0 3****AIM**

To have a thorough knowledge of the basics of chemistry particularly engineering oriented topics to engineering students.

**OBJECTIVES**

To make the students conversant with the principles of the following topics: (i) Water Technology, (ii) Engineering Materials and Polymers,(iii) Surface Chemistry and Nanomaterials,(iv) Analytical Techniques and (v) Chemical Kinetics

**UNIT I****WATER TECHNOLOGY****9**

Water as a universal solvent – hard and soft water – reasons for hardness – disadvantages of hard water in washing and industrial purposes - estimation of hardness by EDTA method, problems; boiler feed water – characteristics- softening methods - external conditioning – demineralization (ion exchange) process, desalination by reverse osmosis method- internal conditioning (phosphate, calgon and carbonate conditioning methods); stages in domestic water treatment – disinfection by chlorination, ozone and UV treatments.

## **UNIT-II ENGINEERING MATERIALS AND POLYMERS 9**

Abrasives – Natural & synthetic – Moh's scale, diamond, carborundum – Refractories – classification and properties – Cement – Manufacture. Lubricants- Types – properties of lubricants – oiliness, fire & flash points, pour & cloud point (definition only) – solid lubricants – Graphite and MoS<sub>2</sub>.

Polymer and polymerization (definition only)- examples for natural & synthetic polymers, Preparation, properties and uses of Kevlar, Nomex, Rubber – natural and synthetic – neoprene, butyl rubber- vulcanization of rubber, Introduction to Conducting polymers and Liquid crystal polymers.

## **UNIT III SURFACE CHEMISTRY AND NANOMATERIALS 9**

Adsorption – classification- adsorption of gases on solids- adsorption isotherms- Freundlich and Langmuir adsorption isotherms- adsorption of solutes from solution- application of adsorption-catalysis and pollution control-Nanomaterials – introduction – carbon nanotubes (CNT) and their applications.

## **UNIT IV ANALYTICAL TECHNIQUES 9**

Importance of spectroscopic techniques- Beer-Lambert's law (problem) – UV-visible spectroscopy and IR spectroscopy – principles – instrumentation (block diagram only) – flame photometry – principle – instrumentation (block diagram only) – estimation of sodium by flame photometry – atomic absorption spectroscopy – principles – instrumentation (block diagram only) – estimation of nickel by atomic absorption spectroscopy. Thermal Analysis- TGA and DTA- principles- thermogram of calcium oxalate monohydrate.

## **UNIT-V CHEMICAL KINETICS 9**

Introduction – rate, rate constant, order & molecularity of reactions –First order reaction – Derivation of rate constant – Second order reactions – rate constant (no derivation, equation and problem only) - activation energy – concept-Arrhenius equation-derivation- steady state approximation.

**TOTAL: 45 PERIODS**

### **TEXT BOOKS:**

1. P.C. Jain and Monica Jain, Engineering Chemistry Dhanpat Rai Pub, Co., New Delhi (2002)
2. S.S. Dara, A text book of engineering chemistry S. Chand & C. Ltd., New Delhi (2006)
3. B. Sivasankar Engineering Chemistry Tate McGraw- Hill Pub. Co. Ltd, New Delhi (2008)

### **REFERENCES:**

1. B. K. Sharma Engineering Chemistry Krishna Prakasan Media (P) Ltd., Meerut (2001)
2. R. Gopalan, D. Venkappayya, Sulochana Nagarajan, Engineering Chemistry Vikas Pub, Co., New Delhi (2006)
3. Principles of physical chemistry by Samuel Glasstone, Van Nostrand pub.comp, Newyork.
4. Principles of physical chemistry by Puri & Sharma, Vikas pub.comp, 2008

**OBJECTIVE**

- To know the fundamental principles of geometrical drawing
- To visualize the various machine components

**Unit I - Introduction****9**

Introduction to Engineering Drawing, Drawing Standard, ISI code of practice, Drawing covering, Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute; Scales – Plain, Diagonal and Vernier Scales;

**Unit II - Orthographic Projection (Points, Lines & Planes)****9**

Principles of orthographic projection-projection of points, straight lines, traces and projection of planes inclined to both planes Orthographic projection of simple engineering components-missing view exercises.

**Unit III - Orthographic Projection (Solids)****9**

Projection of solids – Inclined to one plane - Sections and Sectional Views of Right Angular Solids covering - Prism, Cylinder, Pyramid, Cone – Auxiliary Views

**Unit IV - Pictorial Projections****9**

Principles of pictorial views, isometric view of simple solids. Free hand sketching of orthographic views from pictorial views. Free hand sketching of isometric views from given two or three views.

**Unit V - Development Of Surfaces & Perspective Projection****9**

Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone; Perspective Projection of Planes and Solids

**L: 45 + T: 15, TOTAL: 60 PERIODS****TEXT BOOKS:**

1. Venugopal K and Prabhu Raja V, “Engineering Graphics”, New Age International Publishers, 2007.
2. . Luzadder W J, “Fundamentals of Engineering Drawing”, Prentice Hall Book Co., New York, 1998
3. Bhat, N.D.& M. Panchal , *Engineering Drawing*, Charotar Publishing House,2008

**REFERENCES:**

1. Kumar M S, “Engineering Graphics”, Ninth Edition, DD Publications, Chennai, 2007.
2. Bureau of Indian Standards, “Engineering Drawing Practices for Schools and Colleges SP 46-2003”, BIS, New Delhi, 2003.
3. Shah, M.B. & B.C. Rana , *Engineering Drawing and Computer Graphics*, Pearson Education,2008





- India, (2005).
4. Brian W.Kernighan and Dennis M.Ritchie, “The C Programming Language”, Pearson Education Inc., (2005).
  5. E.Balagurusamy, “Computing fundamentals and C Programming”, Tata McGraw-Hill Publishing Company Limited, (2008).
  6. S.Thamarai Selvi and R.Murugan, “C for All”, Anuradha Publishers, (2008).

**CS1171**

**COMPUTER PRACTICE LAB - I**

**0 1 2 2**

**LIST OF EXERCISES**

**a) Word Processing 15**

1. Document creation, Text manipulation with Scientific notations.
2. Table creation, Table formatting and Conversion.
3. Mail merge and Letter preparation.
4. Drawing - flow Chart

**b) Spread Sheet 15**

5. Chart - Line, XY, Bar and Pie.
6. Formula - formula editor.
7. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
8. Sorting and Import / Export features.

**c) Simple C Programming \* 15**

9. Data types, Expression Evaluation, Condition Statements.
10. Arrays
11. Structures and Unions
12. Functions

**\* For programming exercises flow chart and pseudo code are mandatory.**

**TOTAL: 45 PERIODS**

**Hardware / Software required for a batch of 30 Students**

**Hardware**

LAN System with 33 nodes (OR) Standalone PCs– 33 Nos.  
Printers– 3 Nos.

**Software**

OS– Windows / UNIX Clone  
Application Package– Office suite  
Compiler– C

**ME1171      COMPUTER AIDED DRAFTING AND MODELING LAB**

**L-T-D: 0-0-2 Credits: 2**

- (i) Introduction to computer aided drafting and solid modeling: software and hardware.
- (ii) Understand basic 2D geometric construction techniques.
  - a. Cartesian and polar coordinate systems: locating points, coordinate entry methods, units and limits.
  - b. Object generation: lines, arcs, polylines, and multilines; rectangles, circles, polygons, and ellipses.
  - c. Transformations: move, copy, rotate, scale, mirror, offset and array; trim, extend, fillet, chamfer
  - d. Layers: creation, naming, properties manager.
  - e. Blocks: create, edit, import and explode.
  - f. Text: creating and editing, formatting, text styles.
  - g. Dimensions: creating and editing, dimension styles.
- (iii) Exercise on basic drafting principles to create technical drawings.
  - a. Create orthographic views of machine parts from pictorial views.
  - b. Create isometric views of machine parts from orthographic views
  - c. Create hatched sectional views of machine parts.
- (iv) Understanding basic solid modeling techniques
  - a. Creation of solid primitives
  - b. Boolean operations
  - c. Extrude, Revolve operations
  - d. 3D Views
- (v) Exercise on basic modeling to create machine parts Create solid models from pictorial views

**TOTAL: 45 PERIODS**

**University Examination:**

Question paper may contain two parts. Part A shall contain 2D drafting which carries 40% marks, Part B shall contain 3D drafting which carries 40% marks and 20% marks is for viva voce conducted during the exam.

**PH1171**

**PHYSICS LAB- I**

**0 0 2 1**

**LIST OF EXPERIMENTS**

(Any five experiments)

1. (a) Particle size determination using Diode Laser  
(b) Determination of Laser parameters- Wavelength and Numerical aperture
2. Determination of velocity of sound and compressibility of liquid- Ultrasonic Interferometer.
3. Determination of thermal conductivity of a bad conductor- Lee's Disc method
4. Determination of thickness of a thin wire- Airwedge
5. Torsional Pendulum- Determination of rigidity modulus
6. Compound pendulum- Determination of acceleration due to gravity
7. Determination of Young's Modulus- Non-Uniform bending

**Reference: Physics lab manual- Department of Physics**

**CH1171**

**CHEMISTRY LAB - I**

**0 0 2 1**

**List of Experiments**

1. Determination of total hardness of water by EDTA method.
  2. Determination of alkalinity (titrimetry method)
  3. Determination of percentage purity of washing soda
  4. Conductometric titration of a strong acid with a strong base
  5. Determination of strength of hydrochloric acid (p<sup>H</sup>metry)
  6. Determination of the amount of Na<sup>+</sup> in water sample (Flame photometry)
  7. Determination of molecular weight and degree of polymerization of a polymer
  8. Determination of the amount of Ca<sup>2+</sup> in water sample .
  9. Determination of iron in rust by Permanganometry.
- Minimum five experiments shall be offered.

**References:**

1. J. Bassette, R. B. Deanen & G. H. Jeffery & J. Mendham, Text book of Vogel Quantitative Inorganic Analysis, ELBS, England.

**TOTAL: 45 PERIODS**

**NOORUL ISLAM CENTRE FOR HIGHER EDUCATION**

**NOORUL ISLAM UNIVERSITY, KUMARACOIL**

**B.TECH. INFORMATION TECHNOLOGY**

**CURRICULUM & SYLLABUS**

**SEMESTER II**

*(Common for All B.E/B.Tech Programmes Except Marine Engineering)*

<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Theory</b>						
1.	EG1102	Technical English – II	3	0	0	3
2.	MA1102	Engineering Mathematics – II	3	1	0	4
3.	PH1102	Engineering Physics – II	3	0	0	3
4.	CH1102	Engineering Chemistry – II	3	0	0	3
5.	ME1102	Engineering Mechanics	3	0	0	3
6.	BE1101	Basic Engineering - I (Basic Electrical and Electronics Engineering)	3	1	0	4
7.	BE1102	Basic Engineering – II (Basic Mechanical and Civil Engineering)	3	1	0	4
<b>Practical</b>						
8.	CS1172	Computer Practice Lab - II	0	1	2	2
9.	PH1172	Physics Lab – II	0	0	2	1
10.	CH1172	Chemistry Lab - II	0	0	2	1
11.	BE1171	Basic Engineering Lab – I (Basic Electrical and Electronics Engineering Lab)	0	0	4	2
12.	BE1172	Basic Engineering Lab – II (Basic Mechanical and Civil Engineering Lab)	0	0	4	2
<b>TOTAL</b>			21	4	14	32

**\*Those who have admitted from the Academic Year 2013-2014 onwards.**

**EG1102**

**TECHNICAL ENGLISH - II**

**3 0 0 3**

**UNIT-I**

**9**

Technical Vocabulary - Active and Passive Vocabulary – Articles - Prepositions – Expansion of Abbreviations and Acronyms

**UNIT-II**

**9**

Phrases- Adverbs –Different grammatical forms of the same word –Active Voice-Passive Voice

**UNIT-III**

**9**

Phonemes - Vowels, Consonants and Diphthongs – Word Stress and Intonation

**UNIT-IV**

**9**

Writing Recommendations – Checklists - Essay Writing - Business Letters: - Letter Calling for quotation, Letter Placing Order, Letter of Complaint, Letter Seeking Clarification - Business Proposal Writing

**UNIT-V**

**9**

Numerical Adjectives – CV/Resume Writing – One Word Substitutes – Virtual Communication: E-Mail Writing

**TOTAL: 45 PERIODS**

**TEXT BOOK:**

Department of Humanities and Social Sciences, Anna University, English for Engineers and Technologists, Combined Edition (Volumes 1 @ 2), Chennai: Orient Black Swan Pvt.Ltd. 2006 Themes 5-8 (Technology, Communication, Environment, Industry)

**EXTENSIVE READING:**

Shiv Khera, You Can Win, Milan, Delhi, 2004

**OR**

CanField Jack, Chicken Soup for the Soul, Westland, Chennai, 1999.

**NOTE:**

The book given under Extensive Reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.

**AIM:**

To impart the fundamental knowledge of Engineering Mathematics to the students in order to achieve a well founded knowledge about the principles of Mathematics.

**OBJECTIVE:**

To develop basic knowledge to the students in differential equations and vector calculus. This subject is further broadened to the functions of complex variables and complex integration. A thorough knowledge about Laplace transforms is also covered to aid the students solve the differential equations.

**UNIT I ORDINARY DIFFERENTIAL EQUATIONS 9**

Linear differential equations of second order with constant and variable coefficients- Cauchy's and Legendre's linear equations – Method of variation of parameters

**UNIT II COMPLEX VARIABLES 9**

Functions of a complex variable – Analytic function – Necessary conditions- Cauchy-Riemann equations in cartesian and polar co-ordinates - Sufficient conditions(excluding proof) – Properties of analytic function – Harmonic and its conjugate – Construction of analytic function by Milne Thomson method – Conformal mappings  
 $w = z + c$ ,  $cz$ ,  $1/z$  and Bilinear transformation.

**UNIT III COMPLEX INTEGRATION 9**

Statement and applications of Cauchy's integral theorem and Cauchy's integral formula – Laurent's expansion – Singular points – Residues – Cauchy's Residue theorem – Evaluation of real definite integral using contour integration(excluding poles on the real

axis) -  $\int_0^{2\pi} f(\cos \theta, \sin \theta) d\theta$  and  $\int_{-\infty}^{\infty} \frac{f(x)}{g(x)} dx$

**UNIT IV VECTOR CALCULUS 9**

Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelepipeds.

**UNIT V LAPLACE TRANSFORMS 9**

Laplace transform – Existence condition– Transforms of elementary functions – Basic properties – Transforms of derivatives and integrals – Transform of Periodic functions. Inverse Laplace transform – Convolution, Initial and Final value theorems (statement only) – Solutions of linear ordinary differential equation of second order with constant coefficients using Laplace transform techniques.

**L: 45 + T: 15, TOTAL: 60 PERIODS**

**TEXT BOOK:**

Grewal B.S., "Higher Engineering Mathematics"- 40<sup>th</sup> Edition , Khanna Publishers, Delhi 2007.

**REFERENCES:**

1. Erwin Kreyszig, " Advanced engineering Mathematics", 7<sup>th</sup> Edition, Wiley India, 2007
2. Veerarajan T, " Engineering Mathematics (for first year)", Tata McGraw- Hill Publishing Company Ltd.,New Delhi,2007.
3. P.Kandasamy , K.Thilagavathy , K.Gunavathy" Engineering Mathematics" S.Chand & Company Ltd.2002.
4. B.V. Ramana,"Higher Engineering Mathematics" Tata McGraw- Hill Publishing Company Ltd.,New Delhi,2006.

**PH1102****ENGINEERING PHYSICS – II****3 0 0 3****AIM:**

To enable the students' understand the Physics behind various engineering materials and correlate it to technological applications.

**OBJECTIVE:**

At the end of the course students would be exposed to

- Fundamentals of quantum mechanics and its application to electron microscopy
- Various crystal structures and their defects
- The synthesis, properties and applications of various engineering materials

**UNIT –I Quantum Mechanics****9**

Matter waves- de-Broglie wavelength - Schrodinger's wave equation-time independent and time dependent equations- physical significance of wave function- particle in a one dimensional box- electron microscope- scanning electron microscope- transmission electron microscope.

**UNIT II Elementary crystal physics****9**

Lattice – Unit cell, Bravais lattice ,lattice planes-Miller indices ,d-spacing in cubic lattice. Calculation of number of atoms per unit cell,atomic radius, coordination number and packing factor for SC,BCC,FCC and HCP structures- diamond cubic, NaCl and ZnS structures. Crystal defects.

**UNIT- III Conducting & Semiconducting Materials****9**

Conducting materials – Drawbacks of classical theory – Quantum theory – Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states Semiconducting materials: intrinsic semiconductor-carrier concentration derivation

- fermi level - electrical conductivity- band gap determination, extrinsic semiconductors, compound semiconductors (qualitative), Hall effect -determination of hall coefficient - applications.

**UNIT- IV Magnetic, Superconducting and Dielectric Materials** **9**

Magnetic Materials: Origin of magnetic moment-Bohr magneton - ferromagnetism – magnetic domains- hysteresis-soft and hard magnetic materials- applications.

Superconductivity: Properties-types of super conductors - BCS theory of superconductivity (qualitative) - applications of superconductors.

Dielectric materials - active and passive dielectrics - types of polarization- dielectric loss- dielectric breakdown – uses of dielectric materials.

**UNIT- V New Engineering Materials** **9**

Metallic glasses: preparation, properties and applications. Shape Memory Alloys (SMA): characteristics, properties and applications.

Nanomaterials -synthesis-top-down approach (Ball milling), bottom-up approach (CVD)- properties and applications.

**TOTAL: 45 PERIODS**

**TEXT BOOKS:**

1. Rajendran, V, and Marikani A, ‘Materials science’ TMH publications, New Delhi
2. Palanisamy P.K “Materials Science”, Scitech publications Pvt Ltd, Chennai
3. Arumugam M, “Materials Science”, Anuradha publications, Kumbakonam
4. R.K. Gaur and S.L.Gupta, ‘Engineering Physics’ Dhanpat Rai publications, New Delhi

**REFERENCES:**

1. Charles Kittel ,” Introduction to solid state physics “, John Wiley & sons, 8ed.
2. Charles P.Poole and Frank J. Owner, “ Introduction to Nanotechnology, Wiley India.
3. Pillai, S.O. ‘Solid state physics’ NewAge international publishers, Chennai.

**CH1102**

**ENGINEERING CHEMISTRY-II**

**3 0 0 3**

**AIM**

To have a thorough knowledge of the basics of chemistry particularly engineering oriented topics to engineering students

**OBJECTIVES**

To make the students conversant with the principles of the following topics: (i) Fuels And Combustion,(ii) Electrochemistry And Corrosion, (iii) Energy Sources And Batteries, (iv) Phase Rule And Alloys And (v) Thermodynamics.



**UNIT I FUELS AND COMBUSTION 9**

Classification of fuels with examples– characteristics of a good fuel- fossil fuels- Coal – proximate and ultimate analysis- metallurgical coke – manufacture by Otto-Hoffmann method – Petroleum processing and refining – cracking (definition only) - knocking – octane number and cetane number – synthetic petrol – Bergius process- Calorific value –GCV, LCV (problems)- Gaseous fuels- water gas and producer gas, Flue gas analysis – Orsat apparatus – theoretical air for combustion (problems).

**UNIT-II ELECTROCHEMISTRY AND CORROSION 9**

Electrochemical cells – reversible and irreversible cells – EMF – measurement of emf – single electrode potential – Nernst equation– reference electrodes – Standard Hydrogen electrode -Calomel electrode – Ion selective electrode – glass electrode and measurement of pH – electrochemical series – significance- Electrochemical corrosion – protective coatings – paints – constituents and functions.

**UNIT –III ENERGY SOURCES AND BATTERIES 9**

Renewable & non-renewable energy sources- wind energy, solar energy and solar cell- Nuclear reactions – Fission and fusion – nuclear reactors – light water and breeder nuclear reactors (elementary ideas only) – Nuclear power plants in India. Batteries- primary and secondary cells- alkaline battery- lead acid battery- nickel cadmium battery- lithium battery (Li-TiS<sub>2</sub>)- H<sub>2</sub>-O<sub>2</sub> fuel cell.

**UNITIV PHASE RULE AND ALLOYS 9**

Statement and explanation of terms involved – one component system – water system – condensed phase rule – simple eutectic system (lead-silver system only) – alloys – importance, ferrous alloys – nichrome, invar and stainless steel – heat treatment of steel, non-ferrous alloys – brass, bronze and solder.

**UNIT-V THERMODYNAMICS 9**

Introduction- I law of thermodynamics (statement only)- Relation between  $\Delta E$  &  $\Delta H$  -II law of thermodynamics (statement only)- concept of entropy – Clausius-Clapeyron equation (no derivation)- Importance, terms involved (problem) -Free energy changes-  $\Delta G$  – Gibbs Helmholtz equation ( derivation) - III law of thermodynamics- concept of absolute entropy- zeroth law of thermodynamics (statement only).

**TOTAL: 45 PERIODS**

**TEXT BOOKS:**

- 1 P.C. Jain and Monica Jain, Engineering Chemistry DhanpatRai Pub, Co., New Delhi (2002)
- 2 S.S. Dara, A text book of engineering chemistry S. Chand & C. Ltd., New Delhi (2006)
3. B. Sivasankar Engineering Chemistry Tate McGraw- Hill Pub. Co. Ltd, New Delhi (2008).

## REFERENCES:

- 1 B. K. Sharma Engineering Chemistry Krishna Prakasan Media (P) Ltd., Meerut (2001)
- 2 Principles of physical chemistry by Samuel Glasstone, Van Nostrand pub.comp, Newyork.
- 3 Principles of physical chemistry by Puri & Sharma, Vikas pub.comp, 2008.

**ME1102**

**ENGINEERING MECHANICS**

**3 0 0 3**

## OBJECTIVE

This is a basic engineering course common to all branches to inculcate in the students, problem solving abilities and to enhance their analytical abilities.

### Unit I - Statics of Particles

**10**

Statics –Basics Concepts, Fundamental principles & concepts: Vector algebra, Newton’s laws, gravitation, force (external and internal, transmissibility), couple, moment (about point and about axis), Varignon’s theorem, resultant of concurrent and non-concurrent coplanar forces, static equilibrium, free body diagram, reactions. Problem formulation concept; 2-D statics, two and three force members, alternate equilibrium equations, constraints and static determinacy; 3-D statics.

### Unit II - Application of Statics & Friction

**9**

Analysis of Structures- Trusses: Assumptions, rigid and non-rigid trusses; Simple truss (plane and space), analysis by method of joints. Analysis of simple truss by method of sections;

**FRICITION:** Friction- Coulomb dry friction laws, simple surface contact problems, friction angles, types of problems, wedges. Sliding friction and rolling resistance

### Unit III - Centroid, Centre of Gravity and Moment of Inertia

**8**

Moment of Inertia- First moment of mass and center of mass, centroids of lines, areas, volumes, composite bodies. Area moments- and products- of inertia, radius of gyration, transfer of axes, composite areas. Rotation of axes, principal area-moments-of-inertia,. Second moment of mass, Mass moments- and products- of inertia, radius of gyration, transfer of axes, flat plates (relation between area- and mass- moments- and products- of inertia), composite bodies. Rotation of axes, principal mass-moments-of-inertia.

### Unit IV - Particle Dynamics

**8**

Rectilinear motion; Plane curvilinear motion (rectangular, path, and polar coordinates). 3-D curvilinear motion; Relative and constrained motion; Newton’s 2nd law (rectangular, path, and polar coordinates). Work-kinetic energy, power, potential energy. Impulse-momentum (linear, angular); Impact (Direct and oblique).

### Unit V Kinematics & Kinetics of Rigid Bodies:

**10**

Plane kinematics of rigid bodies- Rotation; Parametric motion. Relative velocity,

instantaneous center of rotation. Relative acceleration, rotating reference frames. Rotating reference frames, 3-part velocity and 5-part acceleration relations, Coriolis acceleration. Plane kinetics of rigid bodies- Kinetics of system of particles and derivation of moment equation. Translation. Fixed axis rotation; General planar motion.

**TOTAL: 45 PERIODS**

**TEXT BOOKS:**

1. Beer F P and Johnson E R, “Vector Mechanics for Engineers, Statics and Dynamics”, Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi, 2006.
2. Tayal A K, “Engineering Mechanics- Statics and Dynamics” , Umesh Publications, Delhi, 2004
3. Irving H. Shames, Engineering Mechanics, Prentice Hall, New Delhi 1997.

**REFERENCES:**

1. Bansal R K, “Engineering Mechanics”, Laxmi Publications Pvt. Ltd., New Delhi, 2006.
2. Bhavikatti S S, “Engineering Mechanics”, New Age International Pvt. Ltd., New Delhi, 2003.
3. Young D H and Timashenko S, “Engineering Mechanics”, Tata Mcgraw-Hill, Fourth Edition, 2006.
4. Jivan Khachane, Ruchi Shrivastava, “Engineering Mechanics: Statics and Dynamics”, ANE Books, 2006.
5. Rajasekaran S and Sankarasubramanian G, “Engineering Mechanics-Statics and Dynamics”, Vikas Publishing House Pvt. Ltd., New Delhi, 2006.
6. NPTEL courses: <http://nptel.iitm.ac.in/courses.php>, web and video resources on *Engineering Mechanics*.

**BE1101**

**BASIC ENGINEERING - I**

**3 1 0 4**

(Basic Electrical and Electronics Engineering)

**Objectives:**

- To understand the basic solutions of AC and DC circuits.
- To study the basic principle and operation of AC and DC machines.
- To study the fundamental operations of measuring instruments.
- To study the layout of power system.

**Unit: 1 – Electrical circuits**

**9**

Ohms Law, Kirchhoff’s laws, Mesh and Nodal Analysis for DC Circuits. Introduction to AC Circuits, Faraday’s Law of Electromagnetic Induction, Lenz law, Inductor, Capacitor, Power factor, Waveforms and RMS value, Average Value, Peak factor and Form factor, Single phase circuits- Series and Parallel, Three phase balanced circuits. Fundamentals of wiring and earthing.

**Unit: II – Electrical Measurements, Machines and Power system 9**

Operating principles of Moving coil and Moving iron instruments (Ammeter and voltmeter), Dynamometer type watt meter and Energy meter, Errors in Measurements. Construction, Principle of operation and Applications of DC Generators, DC Motors, Single phase transformers. Structure of power system

**UNIT- III Semiconductor devices and applications 9**

Characteristics of PN Junction diode-Zener Effect-Zener diode and its characteristics-Half wave and Full wave Rectifiers-Voltage regulation,Bipolar Junction transistor-CB,CE,CC Configuration and characteristics.

**UNIT-IV Digital Electronics 9**

Binary number system-logic gates-Boolean algebra-Combinational Circuit-half and Full adder,Sequential Circuit-Flip flops-Shift Registers(SIPO,SISO,PIPO,PISO) – Counters: Synchronous and Asynchronous –A/D conversion-Successive approximation,D/A conversion-Weighted Resistor

**UNIT – V Fundamentals of Communication Engineering 9**

Types of Signals: Analog and Digital Signals – Modulation and Demodulation – Principles of Amplitude and Frequency modulation – Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fiber (Block Diagram)

**L: 45 + T: 15, TOTAL: 60 PERIODS**

**TEXT BOOKS:**

1. V.N. Mittle “Basic Electrical Engineering”, Tata McGraw Hill Edition, New Delhi, 1990.
2. V.K.Mehta “Principles of Power System”, S.Chand & Company Ltd, New Delhi, 2001.
3. R.S.Sedha,”Applied electronics”S.Chand&Co.,2006.

**REFERENCES:**

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, “Basic Electrical, Electronics and Computer Engineering”, Tata McGraw Hill, Second Edition, (2006).
2. Nagsarkar T K and Sukhija M S, “Basics of Electrical Engineering”, Oxford press (2005).
3. Chakrabarti A, Soni M.L, Gupta P.V, Bhatnagar U.S , “ A Text book on Power System Engineering,” Dhanpat Rai & Co, New Delhi,2010.
4. Muthusubramanian R, Salivahanan S and Muraleedharan K A, “Basc Electrical Electronics and Computer engineering”,Tata McGraw Hill, Second edition(2006).
5. Nagsarkar T K and Sukhija M S, “Basics of Electrical Engineering”, Oxford Press(2005).
6. Mehta V K, “Principles of Electronics”,S.Chand&Company Ltd(1994).
7. Mahmood Nahvi and Joseph A. Edminister, “Electric Circuits”, Schaum’ Outline Series McGraw Hill,(2002).
8. Premkumar N, “Basic Electrical Engineering”, Anuradha Publishers,(2003)

**BE1102**

**BASIC ENGINEERING – II**  
(Basic Mechanical and Civil Engineering)

**3 1 0 4**

**Aim:**

To introduce students to the profession of Mechanical and Civil Engineering and involve them in small-scale projects which would allow them to develop teamwork skills.

**Objective:**

- To understand the basic knowledge about the Mechanical components used in various application
- To be aware of the different fields of Civil Engineering, such as Surveying, Structural and Transportation Engineering.

**Unit I – IC Engine and Boilers**

**9**

IC Engines: Working and comparison of two stroke and four stroke petrol and diesel engines - general description of various systems using block diagrams – air system, fuel system and ignition system. A brief description of CRDI, MPFI, GDI and Hybrid Vehicles.

Steam boilers: Classification – Cochran boiler, Babcock and Wilcox boiler, High pressure Boilers - Lamont, Benson boiler

**Unit II – Compressor, Blower, Pumps, Power plants, Refrigeration and Air Conditioning**

**9**

Principles and fields of application of compressors - reciprocating and centrifugal, blower principle, pumps- reciprocating, and centrifugal pumps steam

Elementary ideas of hydroelectric, thermal and nuclear power plants

Refrigeration & Air Conditioning: Refrigerants, Vapor compression system, Vapor absorption system window air conditioning unit -types (general description only).

**Unit III – Manufacturing Processes**

**9**

Basic Principles of Manufacturing processes – casting, metal forming - forging, rolling, Metal joining - soldering, Welding Machining processes- Lathe construction, operation - turning, taper turning, thread cutting

**UNIT - IV Civil Engineering and Materials**

**9**

**Introduction:** Civil Engineering, branches of Civil Engineering, contribution to society, Scope,

**Civil Engineering Materials:** Bricks – stones – sand – cement – concrete – steel sections, glass, wood, FRP

**Surveying:** Objects – types – classification – principles – measurements of distances – angles – leveling – determination of areas – illustrative examples.

**Sub Structure:** Types, Bearing capacity – Requirement of good foundations.

**Superstructure:** Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering– Types of Bridges and Dams

## UNIT- V Civil Engineering structures

### Building planning

9

Residential, Institutional and industrial – functional requirements. – Basics of Interior Design and Landscaping.

**Roads**- benefits- classifications- traffic signs

**Bridges**-components of bridges-Dam-Purpose of reservoir.

**Environmental Engineering:** Protected water supply, water treatment methods-sewage treatment- Pollution-Types-causes-remedial measures

**L: 45 + T: 15, TOTAL: 60 PERIODS**

### TEXT BOOKS

- 1) Dr. B.C. Punmia, Ashok Kumar Jain, Arun Kr. Jain, “Basic Civil Engineering”, Laxmi Publications,
- 2) Roy and Choudhary, “*Elements of Mechanical Engineering*”
- 3) J Benjamin, “*Basic Mechanical Engineering*”

### References

1. K.Venugopal and v prabu raja “*Basic Mechanical Engineering*” Anuradha Agencies
2. Shanmugam G and Palanichamy M.S “*Basic Mechanical Engineering*” Tata MC Graw Hill.
3. Shanmugam G and Palanichamy M S, “Basic Civil and Mechanical Engineering”, Tata McGraw Hill Publishing Co., New Delhi, (1996).
4. Ramamrutham. S, “Basic Civil Engineering”, Dhanpat Rai Publishing Co. (P) Ltd. (1999).
5. Seetharaman S. “Basic Civil Engineering”, Anuradha Agencies, (2005).

**CS1172                      COMPUTER PRACTICE LAB – II                      0 1 2 2**

**Prerequisite: None**

#### List of Experiments

- |   |           |
|---|-----------|
| <b>1.      Unix Commands</b>                                      | <b>15</b> |
| Study of Unix OS - Basic Shell Commands - Unix Editor             |           |
| <b>2.      Shell Programming</b>                                  | <b>15</b> |
| Simple Shell program - Conditional Statements - Testing and Loops |           |
| <b>3.      C Programming on Unix</b>                              | <b>15</b> |
| Dynamic Storage Allocation-Pointers-Functions-File Handling       |           |

**TOTAL: 45 PERIODS**

**Hardware / software requirements for a batch of 30 students**

**Hardware**

1 UNIX Clone Server  
33 Nodes (thin client or PCs)  
Printer– 3 Nos.

**Software**

OS– UNIX Clone (33 user license or License free Linux)  
Compiler- C

**PH1172**

**PHYSICS LAB - II**

**0 0 2 1**

**LIST OF EXPERIMENTS**

(Any five experiments)

1. Determination of focal length of convex lens- Newtons Rings
2. Determination of wavelength of mercury spectrum- Spectrometer grating
3. Determination of Viscosity of a liquid- Poiseuille's method.
4. Determination of hysteresis loss in a ferromagnetic material.
5. Determination of dielectric constant of a material at room temperature.
6. Determination of band gap of a semiconducting material.
7. Determination of Young's modulus- Uniform bending.

**REFERENCE:** Physics lab manual- Department of Physics

**CH1172**

**CHEMISTRY LAB- II**

**0 0 2 1**

**LIST OF EXPERIMENTS**

1. Determination of concentration of ferrous ion by potentiometry.
  2. Conductometric titration of mixture of acids.
  3. Estimation of copper in brass by EDTA method.
  4. Determination of chloride content in water sample by argentometry.
  5. Determination of acidity by titrimetry.
  6. Determination of iron content in a solution by spectrophotometric method.
  7. Determination of amount of water of crystallization in hydrated barium chloride.
  8. Percentage purity of limestone (permanganometry)
- Minimum five experiments shall be offered.

**TOTAL: 45 PERIODS**

**REFERENCES:**

1. J. Bassette, R. B. Deanen & G. H. Jeffery & J. Mendham, Text book of Vogel Quantitative Inorganic Analysis, ELBS, England.

**BE1171**

**BASIC ENGINEERING LAB – I**  
(Basic Electrical and Electronics Engineering Lab)

**0 0 4 2**

**I. Electrical Engineering Lab**

- 1 Study of Symbols, Cables and Earthing.
- 2 Residential house wiring using switches, fuse, indicator, lamp and energy meter.
- 3 Fluorescent lamp wiring.
- 4 Stair case wiring / Lamp control from three different places/ Doctor Room control/ Go down control
- 5 Measurement of electrical quantities – voltage, current, power & computation of power factor in RLC circuit.
- 6 Measurement of energy using single phase energy meter.
- 7 Fan Wiring.

**II. Electronics Engineering Lab**

- 1 Study of Electronic components and equipments – Resistor, colour coding, Measurement of AC signal parameter (peak-peak, rms period, frequency) using CRO.
- 2 Study of logic gates AND, OR, EX-OR and NOT, NAND and NOR.
- 3 Generation of Clock Signal.
- 4 Soldering practice – Components, Devices and Circuits – Using general purpose PCB.
- 5 Measurement of ripple factor of HWR and FWR.
- 6 Characteristics of PN Junction diode
- 7 Characteristics of Zener diode
- 8 Voltage Regulator using Zener diode

**TOTAL: 45 PERIODS**

**BE1172**

**BASIC ENGINEERING LAB – II**  
(Basic Mechanical and Civil Engineering Lab)

**0 0 4 2**

**OBJECTIVE:**

Introduction to different materials in engineering practices with respect to their workability, formability & machinability with hand tools & power tools and to develop skills through hands on experience.

**I. Mechanical Engineering Lab**

1. Welding - Metal arc welding tools and equipment, exercises.
2. Fitting - Tools, operations, exercises, types of joints. (*Term work to include one job involving fitting to size, male-female fitting with drilling and tapping.*)



3. Foundry- Tools, preparation of moulding sand, patterns, cores, foundry exercises.
4. Carpentry- Tools, carpentry process, carpentry exercises, types of joints.
5. Assembly and Inspection.( *Assembly and Disassembly of some products, tools used. Videos of advancement in manufacturing technology. Inspection of various components using different measuring instruments.*)
6. Machine Tools I - Demonstration of drilling machine.
7. Machine Tools II - Demonstration of Lathe.
8. Study of Automobile and Power Transmission.
9. Wood working - Demonstration of wood working machinery and furniture manufacturing.( *Term work includes one job involving joint and woodturning*)

## II. Civil Engineering Lab

### Buildings:

- (a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

### Plumbing Works:

- (a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
- (b) Study of pipe connections requirements for pumps and turbines.
- (c) Preparation of plumbing line sketches for water supply and sewage works.
- (d) Hands-on-exercise:  
Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.
- (e) Demonstration of plumbing requirements of high-rise buildings.

### Carpentry using Power Tools only:

- (a) Study of the joints in roofs, doors, windows and furniture.
- (b) Hands-on-exercise: Wood work, joints by sawing, planing and cutting.
- (c) Demonstration of elementary surveying techniques

**TOTAL: 45 PERIODS**

### List of equipment and components (For a Batch of 30 Students)

- |  |                                       |
|--|---------------------------------------|
| 1. Assorted components for plumbing consisting of metallic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings. | plastic pipes,<br><br><b>15 Sets.</b> |
| 2. Carpentry vice (fitted to work bench)   | <b>15 Nos.</b>                        |
| 3. Standard woodworking tools  | <b>15 Sets.</b>                       |
| 4. Models of industrial trusses, door joints, furniture joints   | <b>5 each</b>                         |
| 5. Power Tools:  |                                       |

- |                           |              |
|---------------------------|--------------|
| (a) Rotary Hammer         | <b>2 Nos</b> |
| (b) Demolition Hammer     | <b>2 Nos</b> |
| (c) Circular Saw          | <b>2 Nos</b> |
| (d) Planer                | <b>2 Nos</b> |
| (e) Hand Drilling Machine | <b>2 Nos</b> |
| (f) Jigsaw                | <b>2 Nos</b> |

6. Surveying equipment for Demonstration

**NOORUL ISLAM CENTRE FOR HIGHER EDUCATION**  
**NOORUL ISLAM UNIVERSITY, KUMARACOIL**  
**B.TECH. INFORMATION TECHNOLOGY**  
**CURRICULUM & SYLLABUS**

**SEMESTER III**

<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>THEORY</b>						
1	MA1201	Engineering Mathematics - III	3	1	0	4
2	IT1201	Computer Architecture	3	0	0	3
3	EC1218	Digital Principles and Design	3	1	0	4
4	IT1202	Principles of Communication	3	0	0	3
5	CS1201	Object Oriented Programming	3	1	0	4
6	IT1203	Data Structures	3	1	0	4
<b>PRACTICAL</b>						
7	IT1271	Digital Lab	0	1	2	2
8	CS1271	Object Oriented Programming Lab	0	1	2	2
9	IT1272	Data Structures using C++ Lab	0	0	4	2
<b>TOTAL</b>			18	6	8	28

**AIM:**

To impart the fundamental knowledge of Engineering Mathematics to the students in order to achieve a well founded knowledge about the principles of Mathematics.

**OBJECTIVE:**

To develop the skill of the students in the areas of boundary value problems and Transform techniques. This will be necessary for their effective studies in a large number of Engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. This course will also serve as a prerequisite for post graduate and specialized studies and research.

**UNIT I PARTIAL DIFFERENTIAL EQUATIONS 9**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solutions of standard types of first order partial differential equations – Lagrange’s linear equation – Homogeneous linear partial differential equations of second and higher order with constant coefficients.

**UNIT II FOURIER SERIES 9**

Dirichlet’s conditions – Fourier series – Change of interval - Odd and Even functions – Half range sine and cosine series – Parseval’s identity – Harmonic Analysis.

**UNIT III BOUNDARY VALUE PROBLEMS 9**

Classification of second order linear partial differential equations – One dimensional wave and heat equations – Assumptions – Fourier series solution – Steady state solution of two dimensional heat equation (insulated edges excluded) – Fourier series solution in Cartesian co-ordinates.

**UNIT IV FOURIER TRANSFORMS 9**

Fourier integral theorem(without proof) – Fourier transform – Sine and Cosine transforms – Properties - Inverse Fourier transform – Inverse sine and cosine transforms – Properties -Transforms of simple functions – Convolution theorem – Parseval’s identity

**UNIT V Z-TRANSFORMS 9**

Z- transform – Elementary properties – convolution theorem-Inverse Z-transform –Partial fraction Method, Inversion integral method and Convolution – Initial and Final value theorems – Formation of difference equations – Solution of difference equations using Z-transform

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

**TEXT BOOK:**

1. Grewal B.S., “Higher Engineering Mathematics” – 40<sup>th</sup> Edition , Khanna Publishers, Delhi 2011.

**REFERENCES:**

1. Kandasamy P, Thilagavathy K, and Gunavathy K., “Engineering Mathematics Volume III”, First Edition, S.Chand & Company Ltd., New Delhi, 1996
2. Veerarajan T., “Engineering Mathematics(for Semester III), Third Edition, Tata McGraw – Hill Publishing Company Limited, New Delhi 2007.
3. Bali, N.P. and Manish Goyal, A Text Book of Engineering Mathematics, Seventh Edition, Lakshmi Publications Pvt. Ltd., New Delhi, 2009.

**IT1201****COMPUTER ARCHITECTURE****3 0 0 3****AIM**

To discuss the basic structure of a digital computer and to study in detail the organization of the arithmetic unit, processing unit, memory unit, multiprocessors and multicomputers.

**OBJECTIVES**

- To have a through understanding of the basic structure and operation of a digital computer, architecture of mainframe computer and cloud computing.
- To discuss in detail the operation of the arithmetic unit including the algorithm and implementation for integer and floating point operations.
- To study in detail the different types of control and the concept of pipelining.
- To study the hierarchical memory system including cache and virtual memories.
- To study the concepts of parallel organization including multiprocessors and multi computers.

**UNIT I BASIC STRUCTURE OF COMPUTERS****10**

Computer Components - Computer Function - Instruction Fetch and Execute – Interrupts - I/O Function - Interconnection Structures - Bus Interconnection - Bus Structure - Multiple-Bus Hierarchies - Elements of Bus Design – PCI – Mainframe computers – Cloud computing architecture.

**UNIT II ARITHMETIC UNIT****8**

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

**UNIT III BASIC PROCESSING UNIT****9**

Fundamental concepts – Execution of a complete instruction – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

**UNIT IV MEMORY SYSTEM****9**

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

**UNIT V PARALLEL ORGANIZATION****9**

Multiple Processor Organizations - Types of Parallel Processor Systems - Parallel Organizations - Symmetric Multiprocessors – Organization - Multiprocessor Operating System Design Considerations - A Mainframe SMP - Multicore Organization.

**TOTAL : 45 PERIODS****TEXT BOOKS**

1. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 8<sup>th</sup> Edition, Pearson Education, 2010.
2. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5<sup>th</sup> Edition “Computer Organization”, McGraw-Hill, 2002

**REFERENCES**

1. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware / software interface”, 5<sup>th</sup> Edition, Morgan Kaufmann, 2014.
2. John P.Hayes, “Computer Architecture and Organization”, 3<sup>rd</sup> Edition, McGraw-Hill, 2012.
3. B. Govindarajalu, “Computer Architecture and Organization”, 2<sup>nd</sup> Edition, Tata McGraw Hill Education, 2011.

**EC1218****DIGITAL PRINCIPLES AND DESIGN****3 1 0 4****AIM**

To provide an in-depth knowledge of the design of digital circuits and the use of Hardware Description Language in digital system design.

**OBJECTIVES**

- To understand different methods used for the simplification of Boolean functions
- To design and implement combinational circuits
- To design and implement synchronous sequential circuits
- To design and implement asynchronous sequential circuits
- To study the fundamentals of VHDL

**UNIT I BOOLEAN ALGEBRA AND LOGIC GATES****9**

Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation methods – Logic gates



- To know the spread spectrum modulation techniques and different multiple access methods.
- To know the concepts of cellular telephone system

### **UNIT I AMPLITUDE MODULATION: TRANSMISSION AND RECEPTION 9**

Principles of amplitude modulation – AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM power distribution, AM modulator circuits – low level AM modulator, medium power AM modulator, AM transmitters – low level transmitters, high level transmitters, Receiver parameters. AM reception: AM receivers – TRF, Superheterodyne receivers, Double Conversion AM receivers.

### **UNIT II ANGLE MODULATION: TRANSMISSION AND RECEPTION 9**

Angle Modulation – FM and PM waveforms, phase deviation and modulation index, frequency deviation, phase and frequency modulators and demodulators, frequency spectrum of a angle modulated waves, Bandwidth requirement, Broadcast band FM, Average power FM and PM modulators – Direct FM and PM, Direct FM transmitters, Indirect transmitters, Angle modulation Vs. amplitude modulation.  
FM receivers: FM demodulators, PLL FM demodulators, FM noise suppression, Frequency Vs. phase Modulation.

### **UNIT III DIGITAL MODULATION TECHNIQUES 8**

Introduction, Binary PSK, DPSK, Differentially encoded PSK, QASK, Binary FSK, MSK, Duobinary encoding – Performance comparison of various systems of Digital Modulation.

### **UNIT IV BASEBAND DATA TRANSMISSION 9**

Sampling theorem, Quadrature sampling of bandpass signals, reconstruction of message from its samples, Signal distortion in sampling, Pulse code modulation, Discrete PAM signals, power spectra of Discrete PAM signals, ISI Nyquist Criterion for Distortionless baseband binary transmission, eye pattern, baseband M-ary PAM systems, adaptive equalization for data transmission.

### **UNIT V SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES 10**

Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, Processing gain, FH spread spectrum, multiple access techniques, wireless communications, TDMA and CDMA, Cellular Telephone concepts: Mobile telephone Service, Cellular Telephone, Cellular system topology.

**TOTAL: 45 PERIODS**

### **TEXT BOOKS**

1. Wayne Tomasi, “Electronic Communication Systems: Fundamentals Through Advanced”, 4<sup>th</sup> edn, Pearson Education, 2001.
2. Simon Haykin, “Digital Communication Systems”, John Wiley & Sons, 1<sup>st</sup> edn., 2010.
3. Wayne Tomasi, “Advanced Electronic Communication Systems”, PHI, 6<sup>th</sup> edn., 2010.



## REFERENCES

1. Simon Haykin, "Communication Systems", John Wiley & Sons, 5<sup>th</sup> edn. 2009.
2. Taub & Schilling, "Principles of Communication Systems", TMH, 3<sup>rd</sup> edn., 2007.
3. Martin S.Roden, "Analog and Digital Communication System", PHI, 5<sup>rd</sup> edn. 2006.
4. Blake, "Electronic Communication Systems", Thomson Delman, 2<sup>nd</sup> edn., 2002.

## CS1201 OBJECT ORIENTED PROGRAMMING 3 1 0 4

### AIM

To understand the concepts of object-oriented programming using C++ and Java.

### OBJECTIVES:

- To learn object oriented concepts
- To learn C++ and Java languages.

### UNIT I OOP BASICS 7

Object oriented programming concepts – objects-classes- methods and messages, Abstraction and encapsulation-inheritance- abstract classes- polymorphism. Introduction to C++- objects-classes-constructors and destructors

### UNIT II POLYMORPHISM 12

Operator overloading - friend functions- type conversions- templates - Inheritance – virtual functions- runtime polymorphism.

### UNIT III I/O BASICS 8

Exception handling - Streams and formatted I/O – file handling – namespaces – StringObjects - standard template library.

### UNIT IV JAVA BASICS 8

Introduction to JAVA , bytecode, virtual machines – objects – classes – Javadoc – packages – Arrays - Strings

### UNIT V REUSABILITY 10

Inheritance – interfaces and inner classes - exception handling – threads - Streams and I/O

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

### TEXT BOOKS

1. B. Trivedi, "Programming with ANSI C++", Oxford University Press, 2007.
2. Cay S. Horstmann, Gary Cornell, "Core JAVA volume 1", Eighth Edition, Pearson Education, 2008.

### REFERENCES

1. ISRD Group, "Introduction to Object-oriented Programming and C++", Tata McGraw-

- Hill Publishing Company Ltd., 2007.
2. ISRD Group, "Introduction to Object-oriented programming through Java", Tata McGraw-Hill Publishing Company Ltd., 2007.
  3. S. B. Lippman, Josee Lajoie, Barbara E. Moo, "C++ Premier", Fourth Edition, Pearson Education, 2005.
  4. D. S. Malik, "C++ Programming: From Problem Analysis to Program Design", Third Edition, Thomson Course Technology, 2007.
  5. K. Arnold and J. Gosling, "The JAVA programming language", Third edition, Pearson Education, 2000.
  6. C. Thomas Wu, "An introduction to Object-oriented programming with Java", Fourth Edition, Tata McGraw-Hill Publishing Company Ltd., 2006.

**IT1203**

**DATA STRUCTURES**

**3 1 0 4**

**AIM**

To provide an ability to decide the appropriate data type and data structure for a given problem

**OBJECTIVES**

- To understand data and information
- To develop proficiency in the specification, representation, storage and implementation of Data Types and Data Structures
- To get a good understanding of applications of Data Structures
- To understand different methods of organizing large amounts of data
- To efficiently implement the different data structures

**UNIT I DATA AND INFORMATION**

**8**

Introduction – data and information – Overview of data structures – Types of data structures – Primitive and non primitive data structures – Binary and decimal integers – Logical information – Storage of information – Data types.

**UNIT II LISTS, STACKS AND QUEUES**

**9**

Abstract Data Type (ADT) – The List ADT – Linked lists – Doubly linked lists- Circularly Linked lists- Applications-The Stack ADT – Applications-The Queue ADT – Applications.

**UNIT III TREES**

**10**

Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Quadratic probing- Double hashing-Priority Queues (Heaps) – Model – Simple implementations – Binary Heap.

**UNIT IV GRAPHS**

**9**

Definitions – Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra’s Algorithm – Minimum Spanning Tree – Prim’s Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity – Introduction to NP-Completeness.

## UNIT V SORTING

9

Preliminaries – Bubble Sort – Insertion Sort – Shellsort – Heapsort – Mergesort – Quicksort – External Sorting.

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

### TEXT BOOKS

1. Ashok N.Kamthane, “Introduction to Data structures in C”, Pearson Education India, 2012.
2. M.A.Weiss, “Data Structures and Algorithm Analysis in C++”, Fourth Edition, Pearson Education 2013.

### REFERENCES

1. Sartaj Sahni, “Data Structures, Algorithms and Applications in C++”, Silicon press, Second edition,2004.
2. Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, “Fundamentals of Data Structures in C++”, Second edition,Silicon press,2007.
3. Y.Langsam,M.J.Augenstein and A.M.Tenenbaum, “ Data Structures using C and C++”, Pearson Education, Asia.
4. Richard.F.Gilberg, Behrouz A Forouzan, “Data Structures A Pseudocode approach with C”, Thompson Books/COLE,1998

## IT1271

## DIGITAL LAB

0 1 2 2

1. Verification of Boolean theorems using digital logic gates.
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder/ subtractor using basic gates and MSI devices.
4. Design and implementation of parity generator/ checker using basic gates and MSI devices.
5. Design and implementation of magnitude comparator.
6. Design and implementation of application using multiplexers.
7. Design and implementation of Shift registers.
8. Design and implementation of Synchronous and Asynchronous counters.
9. Coding combinational circuits using Hardware Description Language (HDL software required).
10. Coding sequential circuits using HDL (HDL software required).

**TOTAL: 45**

**CS1271**

**OBJECT ORIENTED PROGRAMMING LAB**

**0 1 2 2**

**AIM:**

To develop object-oriented programming skills using C++ and Java

**LIST OF EXPERIMENTS:**

1. Function overloading, default arguments in C++
2. Simple class design in C++, namespaces, objects creations
3. Class design in C++ using dynamic memory allocation, destructor, copy constructor
4. Operator overloading, friend functions
5. Overloading assignment operator, type conversions
6. Inheritance, run-time polymorphism
7. Template design in C++
8. I/O, Throwing and Catching exceptions
9. Program development using STL
10. Simple class designs in Java with Javadoc
11. Designing Packages with Javadoc comments
12. Interfaces and Inheritance in Java
13. Exceptions handling in Java
14. Java I/O
15. Design of multi-threaded programs in Java

**TOTAL: 45**

**IT1272**

**DATA STRUCTURES USING C++ LAB**

**0 0 3 2**

**AIM**

To teach the principles of good programming practice and to give a practice training in writing efficient programs in C++

**OBJECTIVES**

- To teach the students to write programs in C++
- To implement the various data structures as Abstract Data Types
- To write programs to solve problems using the ADT's

**Implement the following exercises using C++**

1. Array implementation of List Abstract Data Type(ADT)
2. Linked list implementation of List ADT
3. Cursor implementation of List ADT
4. Array Implementation of Stack ADT
5. Linked list implementation of Stack ADT

The following three exercises are to be done by implementing the following source files

- a) Program for 'Balanced Paranthesis'
- b) Array implementation of Stack ADT
- c) Linked list implementation of Stack ADT
- d) Program for 'Evaluating Postfix Expressions'

An appropriate header file for the Stack ADT should be #included in (a) and (d)

6. Implement the application for checking 'Balanced Paranthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
7. Implement the application for checking 'Balanced Parenthesis' using linked list implementation of Stack ADT (by using file (a) and (c) given above).
8. Implement the application for 'Evaluating Postfix Expression' using array implementation of Stack ADT (by implementing files (b) and (d) given above)
9. Implement the application for 'Evaluating Postfix Expression' using linked list implementation of Stack ADT (by implementing files (c) and (d) given above).
10. Queue ADT.
11. Search Tree ADT-Binary Search Tree.
12. Implement Hashing Techniques.
13. Heap sort.
14. Quick sort.
15. Implement Dijkstra's algorithm for finding shortest path

**NOORUL ISLAM CENTRE FOR HIGHER EDUCATION**  
**NOORUL ISLAM UNIVERSITY, KUMARACOIL**  
**B.TECH. INFORMATION TECHNOLOGY**  
**CURRICULUM & SYLLABUS**  
**SEMESTER IV**

<b>SL. NO.</b>	<b>SUBJECT CODE</b>	<b>SUBJECT</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>THEORY</b>						
1.	MS1201	Environmental Science	3	0	0	3
2.	MA1204	Statistics and Numerical Methods	3	1	0	4
3.	IT1204	Operating Systems	3	1	0	4
4.	IT1205	Software Engineering Principles	3	1	0	4
5.	IT1206	Data Communication and Computer Networks	3	1	0	4
6.	IT1207	Microprocessors and Microcontrollers	3	1	0	4
<b>PRACTICAL</b>						
7.	IT1273	Open Source Lab	0	0	4	2
8.	IT1274	Computer Networks Lab	0	0	4	2
9.	IT1275	Microprocessors and Microcontrollers Lab	0	0	4	2
<b>TOTAL</b>			<b>18</b>	<b>5</b>	<b>12</b>	<b>29</b>

**OBJECTIVES**

- To provide the students about general aspirants of environment and ecology, the environment pollution and the current social issues.

**UNIT I: NATURE OF ENVIRONMENT STUDIES AND NATURAL RESOURCES****9**

Environment studies- definition- multi disciplinary nature – scope and importance- need for public awareness- Natural resources- Forest resources- energy resources- food Resources- water resources – land resources - mineral resources.

**UNIT II: ECO SYSTEMS AND BIO-DIVERSITY****9**

Concept and component of eco systems- producer, consumer, decomposer- structure and function of eco system- food chain and food web- energy flow model- aquatic eco system- forest eco system- desert eco system- pyramid of biomass- ocean eco system- grass land eco system- Bio diversity in India- value of bio diversity- biodiversity threatens- biodiversity protection- In-situ and Ex-situ conservation.

**UNIT III: ENVIRONMENTAL POLLUTION****9**

Meaning of environmental pollution- air pollution- acid rain – global warming- water pollution- water pollution control- soil pollution- urban waste and soil pollution- marine pollution- noise pollution- thermal pollution- solid and hazardous waste management- waste disposal methods- solid waste and India- natural disaster and disaster management. Low carbon perspectives, Energy savings, Safety and Security

**UNIT IV: SOCIAL ISSUES AND THE ENVIRONMENT****9**

Unsustainable to sustainable development- sustainable development in India- water conservation, watershed management and water harvesting- environmental ethics- role of engineer in environmental protection- economic aspects of environment.

**UNIT V: HUMAN POPULATION AND ENVIRONMENT****9**

Population growth- distribution of population- factors affecting variation in population- theories of population- future of human population- family welfare programme- HIV and AIDS- environment and human health- human rights- value education- women and child welfare.

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Cunningham & saigo: 'Environmental science :A global concern' 4<sup>th</sup> Ed.W.c. Brown Publishers. USA. 1997
2. Chauhan A.S, 'Environmental studies' 2<sup>nd</sup> revised ed.2004, Jain Brother publishers, New Delhi

## REFERENCE BOOKS

1. Benny Joseph : 'Environmental Science and Engineering', 2006, Tata McGraw- Hill Publication.
2. Siddique K.A. : Elements of Ecology and Environmental Pollution, 1<sup>st</sup> Ed. 2002, Kushal Publication, Varanasi.

**MA1204                      STATISTICS AND NUMERICAL METHODS                      3 1 0 4**

### **UNIT I                      PROBABILITY AND DISTRIBUTIONS                      9**

Axioms of probability – Independent Events -Random variable - Probability mass functions - Probability density functions -Distribution functions- Properties – Expectation. Binomial, Poisson, Geometric, Uniform, Exponential, Gamma, Weibull and Normal distributions and their properties (Problems only)

### **UNIT II    CORRELATION, REGRESSION AND ANALYSIS OF VARIANCE                      9**

Pearson's Correlation coefficient- Spearman's Rank correlation coefficient. Regression lines – Analysis of Variance- One-way classification and two way classification. Principles of design of experiments - Completely randomized design – Randomized block design

### **UNIT III    TESTING OF HYPOTHESIS                      9**

Sampling distribution – Standard error – Sample size –Type I error and Type II error - One tailed and Two tailed tests – large sample tests- Proportions – means and difference of means – Small sample tests – t-tests : Single mean, difference of means – F test for variances – Chi square test for independence of attributes and goodness of fit.

### **UNIT IV    SOLUTION OF EQUATIONS                      9**

Fixed point iteration method - Newton-Raphson method- Gauss Elimination method – Gauss-Jordan methods – Iterative methods of Gauss-Jacobi and Gauss-Seidel. Advantages and limitations of the above methods.

### **UNIT V INTERPOLATION, NUMERICAL DIFFERENTIATION AND INTEGRATION                      9**

Lagrange's interpolation – Newton's forward and backward difference interpolation formula- Numerical differentiation using Newton's forward and backward difference interpolation formula - Numerical integration using Trapezoidal and Simpson's 1/3 rules.

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

## TEXT BOOKS

1. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, Eight Edition, Sultan Chand & Sons, 1996. Unit 1 ,2,3
2. Venkatraman M.K, "Numerical Methods" Fifth Edition, National Pub. Company, Chennai 2005 Unit 4, 5



## REFERENCES:

1. Veerarajan T., Probability, Statistics and Random Processes, Second Edition, Tata McGraw Hill, 2007
2. R.A. Johnson and C.B. Gupta, “Miller and Freund’s Probability and Statistics for Engineers”, Fifth Edition, Pearson Education, Asia, 1994 (For units 3, 4 and 5).
3. Gerald, C. F. and Wheatley, P. O., “Applied Numerical Analysis”, Sixth Edition, Pearson Education Asia, New Delhi, 2006.
4. Grewal, B.S. and Grewal, J.S., “ Numerical methods in Engineering and Science”, Eighth Edition, Khanna Publishers, New Delhi, 2009.

**IT1204**

**OPERATING SYSTEMS**

**3 1 0 4**

## AIM

To learn the various aspects of operating systems such as process management, memory management, I/O management and open source.

## OBJECTIVES

- To know the components of an operating system.
- To have a thorough knowledge of process management
- To have a thorough knowledge of storage management
- To know the concepts of I/O and file systems.

## UNIT I PROCESSES AND THREADS

**9**

Introduction to operating systems – review of computer organization – operating system structures – system calls – system programs – system structure – virtual machines. Processes: Process concept – Process scheduling – Operations on processes – Cooperating processes – Inter process communication – Communication in client-server systems. Threads: Multi-threading models – Threading issues.

## UNIT II PROCESS SCHEDULING AND SYNCHRONIZATION

**10**

CPU Scheduling: Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling Case study: Process scheduling in Linux. Process Synchronization: The critical-section problem – Synchronization hardware – Semaphores – Classic problems of synchronization – critical regions – Monitors. Deadlock: System model – Deadlock characterization – Methods for handling deadlocks – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from deadlock.

## UNIT III STORAGE MANAGEMENT

**9**

Memory Management: Background – Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging. Virtual Memory: Background – Demand paging – Process creation – Page replacement – Allocation of frames – Thrashing.

## UNIT IV FILE SYSTEMS

**9**

File-System Interface: File concept – Access methods – Directory structure – File system mounting – Protection. File-System Implementation: Directory implementation – Allocation

methods – Free-space management – efficiency and performance – recovery – log-structured file systems.

## **UNIT V I/O SYSTEMS**

**8**

I/O Systems – I/O Hardware – Application I/O interface – kernel I/O subsystem – streams – performance. Mass-Storage Structure: Disk scheduling – Disk management – The Linux System- Retrieving the kernel source - Configuring and Building-Installing and Booting from a Kernel.

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

### **TEXT BOOKS**

1. Silberschatz, Galvin, and Gagne, “Operating System Concepts”, 9<sup>th</sup> Edition, Wiley India Pvt Ltd, 2013.
2. Greg Kroah-Hartman ,” Linux Kernel in a Nutshell”, O’Reilly Media, December 2006

### **REFERENCES**

1. Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Pearson Education, 2004.
2. Gary Nutt, “Operating Systems”, Third Edition, Pearson Education, 2004.
3. Harvey M. Deital, “Operating Systems”, Third Edition, Pearson Education, 2004.

**IT1205**

**SOFTWARE ENGINEERING PRINCIPLES**

**3 1 0 4**

### **AIM**

To introduce the methodologies involved in the development, maintenance and management of software, over its entire life cycle.

### **OBJECTIVE**

To learn about

- Different life cycle models
- Requirement engineering process
- Analysis modeling and specification
- Architectural and detailed design
- Implementation and testing strategies
- Software quality and models
- Software management

## **UNIT I SOFTWARE PROCESS 9**

Introduction - S/W Engineering Paradigm - life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering - computer based system - process quality - product quality - life cycle process - development process - system engineering hierarchy.

## **UNIT II SOFTWARE REQUIREMENTS 9**

Functional and non-functional - user - system - requirement engineering process - feasibility studies - requirements - elicitation - validation and management - software prototyping - prototyping in the software process - rapid prototyping techniques - user interface prototyping - S/W document - analysis and modeling - data, functional and behavioral models - structured analysis and data dictionary.

## **UNIT III DESIGN AND IMPLEMENTATION 9**

Design process and concepts - modular design - design heuristic - design model and document - software architecture - data design - architectural design - transform and transaction mapping - user interface design - user interface design principles - Real time systems - Real time software design - system design - real time executives - data acquisition system - monitoring and control system - SCM - Need for SCM - Version control - Introduction to SCM process - software configuration items - implementation - coding - building - packaging.

## **UNIT IV TESTING AND QUALITY 9**

Taxonomy of software testing - levels - test activities - types of s/w test - black box testing - testing boundary conditions - structural testing - test coverage criteria based on data flow mechanisms - regression testing - testing in the large - S/W testing strategies - strategic approach and issues - unit testing - integration testing - validation testing - system testing and debugging - quality - quality models - verification - validation.

## **UNIT V SOFTWARE MANAGEMENT 9**

Measures and measurements - S/W complexity and science measure - size measure - data and logic structure measure - information flow measure - software cost estimation - function point models - cost estimation- defining a task network - scheduling - earned value analysis - error tracking - software changes - program evolution dynamics - software maintenance - architectural evolution - taxonomy of CASE tools.

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

### **TEXT BOOK**

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, 7<sup>th</sup> edition, 2010.

### **REFERENCES**

1. Ian Sommerville, Software engineering, Pearson education Asia, 9<sup>th</sup> edition, 2010.
2. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
3. James F Peters and Witold Pedrycz, "Software Engineering - An Engineering Approach", John Wiley and Sons, New Delhi, 2000.

4. Ali Behforooz and Frederick J Hudson, “Software Engineering Fundamentals”, Oxford University Press, New Delhi, 1996.

**IT1206 DATA COMMUNICATION AND COMPUTER NETWORKS 3 1 0 4**

**AIM**

To introduce the concepts, terminologies and technologies used in modern days data communication and computer networking.

**OBJECTIVES**

- To understand the concepts of data communications.
- To study the functions of different layers.
- To introduce IEEE standards employed in computer networking.
- To make the students to get familiarized with different protocols and network components.

**UNIT I DATA COMMUNICATIONS 8**

Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies – Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

**UNIT II DATA LINK LAYER 10**

Error – detection and correction – Parity – LRC – CRC – Hamming code – Flow Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

**UNIT III NETWORK LAYER 10**

Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers.

**UNIT IV TRANSPORT LAYER 9**

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

**UNIT V APPLICATION LAYER 8**

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

## **TEXT BOOKS**

1. Andrew S. Tanenbaum and Wetherall, “Computer Networks”, 5<sup>th</sup> Edition, Pearson Education, 2011.
2. William Stallings, “Data and Computer Communication”, 10<sup>th</sup> Edition, Prentice Hall, 2013.

## **REFERENCES**

1. Behrouz A. Forouzan, “Data Communication and Networking”, 5<sup>th</sup> Edition, Tata McGraw Hill, 2013.
2. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.

## **IT1207            MICROPROCESSORS AND MICROCONTROLLERS            3 1 0 4**

### **AIM**

To learn the architecture programming and interfacing of microprocessors and microcontrollers.

### **OBJECTIVES**

- To introduce the architecture and programming of 8085 microprocessor.
- To introduce the interfacing of peripheral devices with 8085 microprocessor.
- To introduce the architecture and programming of 8086 microprocessor.
- To introduce the architecture, programming and interfacing of 8051 micro controller.

### **UNIT I            8085 CPU            9**

8085 Architecture – Instruction set – Addressing modes – Timing diagrams – Assembly language programming – Counters – Time Delays – Interrupts – Memory interfacing – Interfacing, I/O devices

### **UNIT II            PERIPHERALS INTERFACING            9**

Interfacing Serial I/O (8251)- parallel I/O (8255) –Keyboard and Display controller (8279) – ADC/DAC interfacing – Inter Integrated Circuits interfacing (I<sup>2</sup>C Standard)- 8253 Programmable interval timer - 8259 programmable interrupt controller

### **UNIT III            8086 CPU            9**

Intel 8086 Internal Architecture – 8086 Addressing modes- Instruction set- 8086 Assembly language Programming–Interrupts

### **UNIT IV            8051 MICROCONTROLLER            9**

8051 Micro controller hardware- I/O pins, ports and circuits – External memory – Instruction set – Addressing modes– Interrupts – Interrupt programming – Assembly language programming

## UNIT V 8051 PROGRAMMING AND APPLICATIONS

9

Serial Data I/O – I/O port programming - Timers and counters - Timer and counter programming – Serial Communication — Interfacing to external memory and 8255 - 8051 Interfacing: LCD, ADC, Sensors, Stepper Motors, Keyboard and DAC.

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

### TEXT BOOKS

1. Ramesh S Gaonkar, Microprocessor Architecture, Programming and application with 8085, 5<sup>th</sup> Edition, Penram International Publishing, New Delhi, 2002. (Unit I, II)
2. Douglas V. Hall, Microprocessors and its interfacing, 3<sup>rd</sup> Edition, McGraw Hill Education, 2012. (Unit III)
3. *Microprocessors & Microcontrollers*, P.Godse, D.A.Godse. Technical Publications, Jan1, 2010 (Unit IV, V)

### REFERENCES

1. A.K. Ray and K.M.Burchandi, Intel Microprocessors Architecture Programming and Interfacing, McGraw Hill International Edition, 2000
2. Kenneth J Ayala, The 8051 Microcontroller Architecture Programming and Application, 2<sup>nd</sup> Edition, Penram International Publishers (India), New Delhi, 1997.
3. M. Rafi Quazzaman, Microprocessors Theory and Applications: Intel and Motorola prentice Hall of India, Pvt. Ltd., New Delhi, 2003.
4. Mohammed Ali Mazidi and Janice Gillispie Mazidi, The 8051 Microcontroller and Embedded Systems, Pearson Education Asia, New Delhi, 2003.

**IT1273**

**OPEN SOURCE LAB**

**0 0 4 2**

1. Download the latest kernel source code from kernel.org and compile in the local system
2. Install the kernel in the local system
3. Configure the kernel and load it in memory for execution

**(Implement the following on LINUX platform. Use C for high level language implementation)**

4. Shell programming
  - command syntax
  - write simple functions
  - basic tests
5. Shell programming
  - loops
  - patterns
  - expansions

- substitutions
6. Write programs using the following system calls of UNIX operating system:  
fork, exec, getpid, exit, wait, close, stat, opendir, readdir
  7. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
  8. Write C programs to simulate UNIX commands like ls, grep, etc.
  9. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
  10. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
  11. Implement the Producer – Consumer problem using semaphores.
  12. Implement some memory management schemes – I
  13. Implement some memory management schemes – II

### **Example for experiment 9 & 10 :**

Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space.

When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit

(All the programs are to be written using C)

1. Write a program that takes a binary file as input and performs bit stuffing.
2. Write a program that takes a binary file as input and implement VRC and CRC Computation.
3. Write a program that takes a binary file as input and performs hamming code generation.
4. Simulation of ARP / ARAP.
5. Simulation of Sliding-Window protocol.
6. Simulation of BGP / OSPF routing protocol.
7. Develop a TCP Client – Server application to transfer file.
8. Design a Client – Server application for chat using UDP.
9. Develop a TCP Echo Client – Server application.
10. Design a UDP Echo Client – Server application.
11. Develop a Client that contacts a given DNS Server to resolve a given host name.
12. Study of NS2.
13. Study of Glomosim / OPNET.

1. Programs for 8/16 bit Arithmetic operations (Using 8085, 8086).
2. Programs for Sorting and Searching (Using 8085, 8086).
3. Programs for Evaluation of Expressions (Using 8085, 8086).
4. Programs for sum of N Series (Using 8085, 8086).
5. Programs for String manipulation operations (Using 8086).
6. Programs for Digital clock and Stop watch (Using 8086).
7. Interfacing ADC and DAC (Using 8085, 8086).
8. Parallel Communication between two MP Kits using Mode 1 and Mode 2 of 8255. (Using 8085, 8086).
9. Interfacing and Programming 8279, 8259 and 8253(Using 8085, 8086).
10. Serial Communication between two MP Kits using 8251 (Using 8085, 8086).



11. Interfacing and Programming of Stepper Motor and DC Motor Speed control.
12. Programming using Arithmetic, Logical and Bit Manipulation instructions of 8051microcontroller.
13. Programming and verifying Timer, Interrupts and UART operations in 8051 microcontroller.
14. Communication between 8051 Microcontroller kit and PC.
15. Mini Project.

**NOORUL ISLAM CENTRE FOR HIGHER EDUCATION**  
**NOORUL ISLAM UNIVERSITY, KUMARACOIL**  
**B.TECH. INFORMATION TECHNOLOGY**  
**CURRICULUM & SYLLABUS**

**SEMESTER V**

<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>THEORY</b>						
1	MS1202	Professional and Business Ethics	3	0	0	3
2	IT1208	Information Theory and Coding	3	1	0	4
3	IT1209	Mobile Computing	3	1	0	4
4	IT1210	Digital Signal Processing	3	1	0	4
5	IT1211	Object Oriented Analysis and Design	3	0	0	3
6	CS1204	Data Base Management System	3	1	0	4
<b>PRACTICAL</b>						
7	IT1276	Case Tools Lab	0	1	2	2
8	CS1273	DBMS Lab	0	1	2	2
9	IT12P1	Mini Project	0	0	4	2
<b>TOTAL</b>			18	6	8	28

**OBJECTIVES**

- To create an awareness on Engineering Ethics and Human Values.
- To instill Moral and Social Values and Loyalty
- To appreciate the rights of Others.

**UNIT I: HUMAN VALUES****9**

Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality.

**UNIT II: ENGINEERING ETHICS****9**

Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories.

**UNIT III: ENGINEERING AS SOCIAL EXPERIMENTATION****9**

Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study

**UNIT IV: SAFETY, RESPONSIBILITIES AND RIGHTS****9**

Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the Three Mile Island and chernobyl case studies. Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime -Professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination.

**UNIT V: GLOBAL ISSUES****9**

Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors - oral leadership-sample code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers (IETE), India, etc.

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Mike Martin and Roland Schinzinger, “Ethics in Engineering”, McGraw-Hill, New York.1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, “Engineering Ethics”, Prentice Hall of India, New Delhi, 2004.

**REFERENCES**

1. Charles D. Fleddermann, “Engineering Ethics”, Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint now available).



**T: 15 + L: 45 = TOTAL: 60 PERIODS**

**TEXT BOOKS**

1. Simon Haykin, "Communication Systems", John Wiley and Sons, 5<sup>th</sup> Edition, 2008.
2. Fred Halsall, "Multimedia Communications, Applications Networks Protocols and Standards", Pearson Education, Asia, 2009.

**REFERENCES**

1. Arijit Saha, NilotPal Manna, Surajit Mandal, "Information Theory, Coding and Cryptography", Pearson Education, 2013.
2. R. Bose, "Information Theory, Coding and Cryptography", TMH 2008.
3. S Gravano, "Introduction to Error Control Codes", Oxford University Press 2009.
4. K Sayood, "Introduction to Data Compression" 4<sup>th</sup> edition , Morgan Kaufmann 2012.

**IT1209**

**MOBILE COMPUTING**

**3 1 0 4**

**AIM**

To provide basics for various techniques in mobile computing and mobile content applications.

**OBJECTIVES**

- Learn the basics of mobile computing.
- Understand the working knowledge on various mobile computing technologies.
- Study the working principles of various generations of mobile networks.
- Gain knowledge about different mobile platforms and application development.
- Study the security issues in mobile computing.

**UNIT I MOBILE COMPUTING FUNDAMENTALS**

**9**

Mobile Computing : Introduction – Characteristics of Mobile computing – Architecture for Mobile Computing – Three-Tier Architecture – Design Considerations for Mobile Computing – Mobile Computing through Telephony – Multiple Access Procedures – Mobile Computing Applications.

**UNIT II EMERGING TECHNOLOGIES**

**9**

Bluetooth – Radio Frequency Identification – Wireless Broadband (WiMAX) – Mobile IP – Internet Protocol Version 6 – Java Card – Mobile Computing over SMS – MMS.

**UNIT III MOBILE TELECOMMUNICATION SYSTEM**

**9**

Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS) – CDMA – Wireless Application Protocol (WAP) – Introduction to 4G.

**UNIT IV MOBILE PLATFORMS**

**9**

Mobile Phones – PDA – Mobile Device Operating Systems : Palm OS Architecture – Application Development – Communication in Palm OS – Symbian OS – iOS – Android – BlackBerry – Windows Phone – J2ME Technology.

## **UNIT V SECURITY IN MOBILE COMPUTING**

**9**

Security Issues in Mobile Computing: Introduction – Information Security – Security Techniques and Algorithms – Security Protocols – Public Key Infrastructure – Security Models – Security Frameworks for Mobile Environment.

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

### **TEXT BOOKS**

1. Asoke K Talukder and Roopa R Yavagal, “Mobile Computing - Technology, Application and Service Creation”, Tata McGraw-Hill Publishing Computing Ltd, 2010.
2. Prasant Kumar Pattnaik and Rajib Mall, “Fundamentals of Mobile Computing”, PHI Learning Pvt. Ltd, New Delhi, 2012.

### **REFERENCES**

1. Jochen H. Schller, “Mobile Communications”, Second Edition, Pearson Education, New Delhi, 2007.
2. William Stallings, “Wireless Communications and Networks”, PHI/Pearson Education, 2002.
3. Kaveh Pahlavan and Prasanth Krishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
4. William C.Y. Lee, “Mobile Cellular Telecommunications - Analog and Digital Systems”, Second Edition, Tata Mc Graw Hill Edition, 2006.
5. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York, 2003.
6. Dharma Prakash Agarwal, Qing and An Zeng, “Introduction to Wireless and Mobile systems”, Thomson Asia Pvt. Ltd, 2005.
7. Android Developers : <http://developer.android.com/index.html>
8. Apple Developer : <https://developer.apple.com/>
9. Windows Phone Dev Center : <http://developer.windowsphone.com>
10. BlackBerry Developer : <http://developer.blackberry.com/>

**IT1210**

**DIGITAL SIGNAL PROCESSING**

**3 1 0 4**

### **AIM**

To study the signal processing methods and processors.

### **OBJECTIVES**

- To have an overview of signals and systems.
- To study DFT and FFT computation
- To study the design techniques for IIR digital filters
- To study the design techniques for FIR digital filters
- To study the finite word length effects in signal processing

## **UNIT I SIGNALS AND SYSTEMS**

**9**

Basic elements of DSP – Concepts of frequency in Analog and Digital Signals – Sampling Theorem – Discrete time signals and systems – Analysis of discrete time LTI systems – Z Transform – Convolution (linear and circular) – Correlation.



**UNIT I                      OBJECT ORIENTED METHODOLOGIES                      9**  
Object Oriented Methodology: Rumbaugh, Booch, Jacobson, Shaler/Mellor, Coad/Yardon, Agile – Patterns – Frame Works – The Unified Approach

**UNIT II                      UML                      9**  
UML– UML Notations– UML Diagrams–Use Case Diagram– Activity Diagram–State chart Diagram– Class Diagram–Object Diagram–Sequential Diagram–Collaboration Diagram.

**UNIT III                      OBJECT ORIENTED ANALYSIS                      9**  
Identify Use Cases – Use Case Model – Documentation – Classification – Identifying Classes – Noun Phrases Approach – Common Class Pattern Approach – Use Case Driven Approach – Identifying Object Relationship, Attributes And Models.

**UNIT IV                      OBJECT ORIENTED DESIGN PATTERNS                      9**  
System sequence diagrams - Relationship between sequence diagrams and use cases  
Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams - UML interaction diagrams - Applying GoF design patterns

**UNIT V                      CODING AND TESTING                      9**  
Mapping design to code – Testing: Issues in OO Testing – Class Testing – OO Integration Testing – GUI Testing – OO System Testing

**TOTAL: 45 PERIODS**

**TEXT BOOK**

1. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", Third Edition, Pearson Education, 2005.

**REFERENCES**

1. Simon Bennett, Steve Mc Robb and Ray Farmer, "Object Oriented Systems Analysis and Design Using UML", Fourth Edition, Mc-Graw Hill Education, 2010.
2. Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Elements of Reusable Object-Oriented Software", Addison-Wesley, 1995.
3. Martin Fowler, "UML Distilled: A Brief Guide to the Standard Object Modeling Language", Third edition, Addison Wesley, 2003.
4. Paul C. Jorgensen, "Software Testing:- A Craftsman.s Approach", Third Edition, Auerbach Publications, Taylor and Francis Group, 2008.



**AIM**

To provide a strong foundation in database technology and an introduction to the current trends in this field.

**OBJECTIVES**

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the emerging trends in the area of distributed DB- OODB- Data mining and Data Warehousing and XML

**UNIT I INTRODUCTION AND CONCEPTUAL MODELING 9**

Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

**UNIT II RELATIONAL MODEL 9**

SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependency and Normalization for Relational Databases (up to BCNF).

**UNIT III DATA STORAGE AND QUERY PROCESSING 9**

Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes- B-Tree - B+Tree – Query Processing.

**UNIT IV TRANSACTION MANAGEMENT 9**

Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.

**UNIT V CURRENT TRENDS 9**

Object Oriented Databases – Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage – XML – Structure of XML- Data- XML Document- Schema- Querying and Transformation. – Data Mining and Data Warehousing.

**T: 15 + L: 45 = TOTAL: 60 PERIODS**

## **TEXT BOOKS**

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.

## **REFERENCES**

1. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing Company, 2003.
3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- “Database System Implementation”- Pearson Education- 2000.
4. Peter Rob and Corlos Coronel- “Database System, Design, Implementation and Management”, Thompson Learning Course Technology- Fifth edition, 2003.

**IT1276**

**CASE TOOLS LAB**

**0 1 2 2**

## **AIM**

To practically familiarize the function of UML

## **OBJECTIVES**

- Learn the basics of OO analysis and design skills.
- Be exposed to the UML design diagrams.
- Learn to map design to code.
- Be familiar with the various testing techniques

**LIST OF EXPERIMENTS: To develop a mini-project by following the 9 exercises listed below.**

1. To develop a problem statement.
2. Identify Use Cases and develop the Use Case model.
3. Identify the conceptual classes and develop a domain model with UML Class diagram.
4. Using the identified scenarios, find the interaction between objects and represent them using UML Sequence diagrams.
5. Draw relevant state charts and activity diagrams.
6. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
7. Develop and test the Technical services layer.
8. Develop and test the Domain objects layer.

9. Develop and test the User interface layer.

**Suggested domains for Mini-Project:**

1. Passport automation system.
2. Book Bank
3. Exam Registration
4. Stock Maintenance System.
5. Online Course Reservation System
6. E-Ticketing
7. Software Personnel Management System
8. Credit Card Processing
9. E-Book Management System
10. Recruitment System
11. Foreign Trading System
12. Conference Management System
13. BPO Management System
14. Library Management System
15. Student Information System

**CS1273**

**DBMS LAB**

**0 1 2 2**

**Aim:** To understand and implement the various phases of DBMS product development.

**LIST OF EXPERIMENTS**

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.

**TOTAL: 45 PERIODS**

**NOORUL ISLAM CENTRE FOR HIGHER EDUCATION**  
**NOORUL ISLAM UNIVERSITY, KUMARACOIL**  
**B.TECH. INFORMATION TECHNOLOGY**  
**CURRICULUM & SYLLABUS**  
**SEMESTER VI**

<b>SL. NO.</b>	<b>SUBJECT CODE</b>	<b>SUBJECT</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>THEORY</b>						
1.	IT1212	Cyber Security	3	0	0	3
2.	IT1213	Web Technology	3	1	0	4
3.	CS1212	Computer Graphics	3	1	0	4
4.	IT1214	Information Storage and Management	3	1	0	4
5.	XX12E1	Elective I	3	0	0	3
6.	XX12E2	Elective II	3	0	0	3
<b>PRACTICAL</b>						
7.	IT1277	Web Technology Lab	0	1	2	2
8.	CS1278	Computer Graphics Laboratory	0	1	2	2
9.	IT12P2	Mini Project	0	0	4	2
<b>TOTAL</b>			<b>18</b>	<b>5</b>	<b>8</b>	<b>27</b>

**AIM**

The Course curriculum aims at imparting the fundamentals of cyber crime investigation, the tools used for the investigation, in addition to giving an exposure to the various kinds of cyber security threats and their impact on connected systems/resources.

**OBJECTIVES**

- The course also gives an exposure to the different types of mechanisms to sanitize the cyber space by adopting standardized operating procedures while transacting business/commerce online, and also to ensure security of information handled over the net.
- Introduction to the Cyber Laws and the IPC/Cr.PC equips the students with sufficient legal knowledge about deterrence in preventing cyber crimes.

**UNIT I COMPUTER ORGANIZATION & ARCHITECTURE AND OPERATING SYSTEMS 6**

Computer Organization, Architecture, Operating Systems, Process Management, CPU Scheduling, I/O Memory Management, file systems and deadlocks. LAN, MAN, WAN, ISO/OSI seven layer architecture.

**UNIT II INFORMATION SECURITY FUNDAMENTALS 6**

Background, Importance, statistics, national and international scenarios. Identification and authentication, confidentiality, privacy, integrity, non-repudiation. Goals of security: prevention, detection and recovery. E-commerce security. Critical Infrastructure Protection.

**UNIT III SECURITY THREATS AND VULNERABILITIES 9**

Overview of security threats, various kinds of threats; Authentication-weak passwords. Insecure internet connection- internet cookies, viruses and other infections. Security of hard drives, security of laptops; sniffers, backdoors and Trojans. Buffer overflow and other programming bugs. Common attacks- DoS, man-in-the-middle, brute force attacks

**UNIT IV OVERVIEW OF SECURITY PRINCIPLES 15**

Security policies and procedures, International standards, Security consideration of OS- OS hardening - Internet protocols and security: SSL/TLS, IP Security, Application layer security - Access Control: Physical, Logical and Biometric - Tools and Techniques: Firewalls, Antivirus, IDS, Log analysis, Cryptography, steganography - Security Infrastructure: PKI, VPN, Digital signature - Network scanners, vulnerability scanners - Device Security - Cloud computing security, Database security.

**UNIT V CYBER CRIMES. 9**

Cyber crimes, Cyber crime Investigation, and Cyber forensic tools. Cyber Laws. Information Technology Act, Cyber laws and cyber crime investigation. Social networks and analysis.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Thomas Calabres and Tom Calabrese, “Information Security Intelligence: Cryptographic Principles & Application”, Thomson Delmar Learning, 2004.
2. Bernadette H Schell, Clemens Martin, “Cyber Crime”, ABC-CLIO Inc, California, 2004.
3. Swiderski, Frank and Syndex, “Threat Modeling”, Microsoft Press, 2004.
4. William Stallings and Lawrie Brown, “Computer Security: Principles and Practice”, Prentice Hall, 2008.

**REFERENCES**

1. Silberschatz A, Galvin P, Gagne G, "Operating Systems Concepts", John Wiley & Sons, Singapore, 2006.
2. Principles and Practices of Information Security by Michael.E. Whiteman and Herbert .J. Mattord.
3. Cyber Laws by Aparna Viswanathan.
4. Joseph M Kizza, “Computer Network Security”, Springer Verlag, 2005.

**IT1213**

**WEB TECHNOLOGY**

**3 1 0 4**

**AIM**

To highlight the features of different technologies involved in Web Technology and various Scripting Languages.

**OBJECTIVES**

- To understand the basics of Internetworking concepts.
- To learn the basics of various Scripting Languages.
- To know the concepts of markup languages
- To study the concepts of servlets and JSP
- To build knowledge on real-time software development.

**UNIT I INTRODUCTION**

**9**

History of the Internet, Internetworking concepts, Architecture and protocol, Switch, Router, Protocols for Internetworking, Internet address and domains, World Wide Web, Web Servers – HTTP request types – System Architecture – Client Side Scripting and Server side Scripting – Accessing Web servers – IIS – Apache web server

**UNIT II HTML AND JAVASCRIPT**

**9**

HTML Tags - List, Tables, Images, Forms, Frames, Cascading Style Sheets -Introduction to JAVA Scripts – Object Based Scripting for the Web - Control Structures – Functions – Arrays – Objects.

**UNIT III DYNAMIC HTML**

**9**

Introduction –Object model and collection - Event Model – Form processing – Event Bubbling – Filters and transitions– Data Binding – Binding to an Image and Table – DOM: Objects and collections.

**UNIT IV      SERVLETS AND JSP****9**

Introduction – Servlet Overview Architecture – Handling HTTP Request – Get and Post request – Redirecting request– JSP – Overview – Objects – Scripting – Standard Actions – Directives.

**UNIT V      DATABASE ACCESS****9**

Database Programming using JDBC, Studying Javax.sql.\* package, Accessing a Database from a JSP Page, Application-specific Database Actions–Multi-tier applications.

**L: 45 + T: 15 = TOTAL: 60 PERIODS****TEXT BOOK**

1. Deitel & Deitel, Goldberg, “Internet and world wide web – How to Program”, Pearson Education Asia, Fifth edition, 2012.

**REFERENCES**

1. Web Technologies- A computer science perspective By Jeffrey C. Jackson, Pearson Education, 2007.
2. Eric Ladd, Jim O’ Donnel, “Using HTML 4, XML and JAVA”, Prentice Hall of India – QUE, 1999.
3. Aferganatel, “Web Programming: Desktop Management”, PHI, 2004.
4. Rajkamal, “Web Technology”, Tata McGraw-Hill, 2002

**CS1212****COMPUTER GRAPHICS****3 1 0 4****AIM**

To impart the fundamental concepts of Computer Graphics.

**OBJECTIVES**

- To gain knowledge about graphics hardware devices and software used.
- To understand the two dimensional graphics and their transformations.
- To understand the three dimensional graphics and their transformations.
- To study illumination and color models.

**UNIT I      INTRODUCTION****9**

Survey of computer graphics, Overview of graphics systems – Video display devices, Raster scan systems, Random scan systems, Graphics monitors and Workstations, Input devices, Hard copy Devices, Graphics Software; Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

**UNIT II      TWO DIMENSIONAL GRAPHICS****9**

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing – viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Two

dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

**UNIT III THREE DIMENSIONAL GRAPHICS 10**

**THREE DIMENSIONAL CONCEPTS:** Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces.

**TRANSFORMATION AND VIEWING:** Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

**UNIT IV ILLUMINATION AND COLOUR MODELS 7**

Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection.

**UNIT V ANIMATIONS & REALISM 10**

**ANIMATION GRAPHICS:** Design of Animation sequences – animation function – raster animation – key frame systems – motion specification –morphing – tweening.

**COMPUTER GRAPHICS REALISM:** Tiling the plane – Recursively defined curves – Koch curves – C curves – Dragons – space filling curves – fractals – Grammar based models – fractals – turtle graphics – ray tracing.

**L: 45 + T: 15 = TOTAL: 60 PERIODS**

**TEXT BOOKS:**

1. John F. Hughes, Andries Van Dam, Morgan Mc Guire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley ,”Computer Graphics: Principles and Practice”, 3<sup>rd</sup> Edition, Addison- Wesley Professional,2013. (UNIT I, II, III, IV).
2. Donald Hearn and Pauline Baker M, “Computer Graphics”, Prentice Hall, New Delhi, 2007 (UNIT V).

**REFERENCES:**

1. Donald Hearn and M. Pauline Baker, Warren Carithers,“Computer Graphics With Open GL”, 4th Edition, Pearson Education, 2010.
2. Jeffrey McConnell, “Computer Graphics: Theory into Practice”, Jones and Bartlett Publishers, 2006.
3. Hill F S Jr., "Computer Graphics", Maxwell Macmillan” , 1990.
4. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, Kelvin Sung, and AK Peters, Fundamental of Computer Graphics, CRC Press, 2010.
5. William M. Newman and Robert F.Sproull, “Principles of Interactive Computer Graphics”, Mc Graw Hill 1978.



**AIM**

This provides a variety of solutions for storing, managing, connecting, securing, sharing, and optimizing information.

**OBJECTIVES**

- Identify the components of managing the data center and understand logical and physical components of a storage infrastructure.
- Evaluate storage architectures, including storage subsystems SAN, NAS, IPSAN, CAS
- Understand the business continuity, backup and recovery methods.

**UNIT-I INTRODUCTION TO STORAGE TECHNOLOGY****9**

Data creation and The value of data to a business, Information Lifecycle, Challenges in data storage and data management, Solutions available for data storage, Core elements of a Data Center infrastructure, role of each element in supporting business activities.

**UNIT-II STORAGE SYSTEMS ARCHITECTURE****9**

Hardware and software components of the host environment, Key protocols and concepts used by each component ,Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications, Concept of RAID and its components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Integrated and Modular storage systems ,high-level architecture and working of an intelligent storage system

**UNIT-III INTRODUCTION TO NETWORKED STORAGE****9**

Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfill the need, Understand the appropriateness of the different networked storage options for different application environments.

**UNIT-IV INFORMATION AVAILABILITY, MONITORING & MANAGING DATA CENTER****9**

Reasons for planned/unplanned outages and the impact of downtime, Impact of downtime. Differentiate between business continuity (BC) and disaster recovery (DR), RTO and RPO, Identification of single points of failure in a storage infrastructure and solutions to mitigate these failures, Architecture of backup/recovery and the different backup/ recovery topologies, replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities. Key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor storage infrastructure.

**UNIT-V SECURING STORAGE AND STORAGE VIRTUALIZATION****9**

Information Security, Critical security attributes for information systems, Storage security domains, Analyze the common threats in each domain. Storage Virtualization: Forms, Configurations and Challenges. Types of Storage Virtualization: Block-level and File-Level.

**L: 45 + T: 15 = TOTAL: 60 PERIODS**

**TEXT BOOK**

1. G.Somasundaram, Alok Shrivastava, EMC Education Series, “Information Storage and Management”, Wiley, Publishing Inc., 2011.

**REFERENCES**

1. Robert Spalding, “Storage Networks: The Complete Reference”,TataMcGraw Hill,Osborne, 2003.
2. Marc Farley, “Building Storage Networks”,TataMcGraw Hill, Osborne. 2001.
3. MeetaGupta, Storage Area Network Fundamentals, Pearson Education Limited, 2002

**IT1277**

**WEB TECHNOLOGY LAB**

**0 1 2 2**

1. Create a web page with the following using HTML
  - i) To embed an image map in a web page
  - ii) To fix the hot spots
  - iii) Show all the related information when the hot spots are clicked
2. Implement the following using DHTML
  - i) Basic functions, variables, condition & loops
  - ii) An application using filters.
  - iii) To give different colors for different heading tags
3. Create a web page with all types of Cascading style sheets.
4. Write a JavaScript program to implement the following
  - i) To control browser frames and windows
  - ii) To create functional forms
  - iii) To display information box as soon as page loads.
  - iv) To change background color after 5 seconds of page load.
  - v) To dynamically bold, italic and underline words and phrases based on user actions.
5. Client Side Scripts for Validating Web Form Controls using DHTML
6. Create a servlet program to retrieve the values entered in the html file.
7. Create a servlet program to calculate the user choice of arithmetic operations.
8. Write programs in Java to create three-tier applications using JSP and Databases
  - For conducting on-line examination.
  - For displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

**TOTAL: 45 PERIODS**

**CS1278**

**COMPUTER GRAPHICS LABORATORY**

**0 1 2 2**

1. To implement Bresenham’s algorithms for line, circle and ellipse drawing
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and sharing.

3. To implement Cohen-Sutherland 2D clipping and window-viewport mapping
4. To perform 3D Transformations such as translation, rotation and scaling.
5. To visualize projections of 3D images.
6. To create 3D scenes.
7. To convert between color models.
8. To perform animation using any Animation software
9. To perform basic operations on image using any image editing software

**TOTAL: 45 PERIODS**

## LIST OF ELECTIVES

<b>SL. No.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
1.	IT12A1	Information Security Concepts	3	0	0	3
2.	IT12A2	Cloud Computing Concepts	3	0	0	3
3.	IT12A3	Component Based Technology	3	0	0	3
4.	IT12A4	Embedded Systems	3	0	0	3
5.	IT12A5	C# and .Net Programming	3	0	0	3
6.	IT12A6	Software Testing	3	0	0	3
7.	IT12A7	Electronics Commerce	3	0	0	3
8.	IT12A8	Building Enterprise Applications	3	0	0	3
9.	IT12A9	Data Warehousing & Data Mining	3	0	0	3
10.	IT12A0	Design and analysis of algorithms	3	0	0	3
11.	IT12B1	Telecommunication Systems	3	0	0	3
12.	IT12B2	Multimedia Compression and Communication Techniques	3	0	0	3
13.	IT12B3	Adhoc and Sensor Networks	3	0	0	3
14.	IT12B4	Data Analytics	3	0	0	3
15.	IT12B5	Free and Open Source Software	3	0	0	3
16.	IT12B6	Web Engineering	3	0	0	3
17.	IT12B7	TCP / IP Design and Implementation	3	0	0	3
18.	IT12B8	Software Quality Assurance	3	0	0	3
19.	IT12B9	Software Project Management	3	0	0	3

**AIM**

To study the critical need for ensuring Information Security in organizations

**OBJECTIVES**

- To understand the basics of Information Security
- To know the legal, ethical and professional issues in Information Security
- To know the aspects of risk management
- To become aware of various standards in this area
- To know the technological aspects of Information Security

**UNIT I INTRODUCTION 9**

Information Security- Basics, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The Security Systems Development Life Cycle.

**UNIT II SECURITY ISSUES 9**

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues.

**UNIT III SECURITY ANALYSIS 9**

Risk Management: Identifying and Assessing Risk, Risk Control Strategies, Planning for Security.

**UNIT IV SECURITY DESIGN 9**

Security Technology: Firewalls and VPNs, IDS, Scanning and Analysis Tools, Access Control Devices, Cryptography, Cryptographic Algorithms and Tools, Protocol for Secure Communications.

**UNIT V SECURITY IMPLEMENTATION 9**

Physical Security, Implementing Information Security, Security and Personnel, Information Security Maintenance.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", 4<sup>th</sup> Edition, Cengage Learning India Private Ltd, 2011.
2. William Stallings, "Cryptography and Network Security: Principles and Practice", 6th Edition, Prentice Hall, 2013.

**REFERENCES**

1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003

3. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.
4. Michael G. Solomon, Mike Chapple, "Information Security- Illuminated", Jones and Bartlett Publishers, 2005.

**IT12A2                      CLOUD COMPUTING CONCEPTS                      3 0 0 3**

**AIM**

To learn basics of the emerging cloud computing paradigm as well as the different ways available to virtualize machines.

**OBJECTIVES**

- To understand the emerging area of "cloud computing" and how it relates to traditional models of computing.
- To impart fundamental concepts in the area of cloud computing
- To impart knowledge in applications of cloud computing

**UNIT-I                      FOUNDATIONS OF CLOUD COMPUTING                      9**

Cloud Computing Basics – History of Cloud Computing – Characteristics of Cloud Computing – Pros and Cons of Cloud Computing – Nature of the Cloud – Technologies in Cloud Computing – Migrating into the cloud – Seven Step Model – Cloud Service Models – Cloud Deployment Models

**UNIT-II                      CLOUD COMPUTING ARCHITECTURE                      9**

Cloud Lifecycle Model – Role of Cloud Modelling and Architecture – Reference Model for Cloud Computing - Cloud Industry Standard – Cloud Computing Logical Architecture – Cloud Modelling and Design – Cloud Computing:Basic Principles – Model for Federated Cloud Computing – Cloud Ecosystem Model – Cloud Governance – Virtualization in Cloud

**UNIT-III                      STORAGE AND SERVICES IN CLOUD                      9**

Cloud Storage Overview – Data management for Cloud Storage – Provisioning Cloud Storage –Data Intensive Technologies – Cloud Characteristic – Distributed Data Storage – Cloud Services – SaaS – PaaS – IaaS – Other Cloud Services

**UNIT-IV                      CLOUD COMPUTING AND SECURITY                      9**

Cloud Computing Risks – Risk Management – Types of Risks in Cloud Computing – Data security in Cloud – Cloud Security Services – Confidentiality, Integrity and Availability – Security Authorization Challenges in Cloud – Secure Cloud Software Requirements – Secure Cloud Software Testing

**UNIT – V                      TOOLS AND APPLICATIONS                      9**

Tools for Building Cloud – Cloud Mashups – Cloud Tools –Moving Applications to Cloud – Amazon Cloud Services – Elastic Compute Cloud (EC2) – Cloud Applications – Cloud based Solutions – Cloud Computing Services - Future Trends in Cloud.

**TOTAL: 45 PERIODS**

## **TEXT BOOKS**

1. Derrick Rountree, Ileana Castrillo, “The Basics of Cloud Computing: Understanding the Fundamentals of Cloud Computing in Theory and Practice”, Syngress, 2014.
2. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”, The Mc-Graw Hill Companies, 2010.
3. A Srinivasan, J.Suresh, “Cloud Computing: A Practical Approach for Learning and Implementation”, Pearson Education, South Asia, 2014.

## **REFERENCES**

1. RajkumarBuyya, Christian Vecchiola, S.ThamaraiSelvi “Mastering Cloud Computing: Foundations and Applications Programming”, McGraw Hill Education (India) private Limited, New Delhi, 2013
2. BorkoFurht, Armando Escalante, “Handbook of Cloud Computing”, Springer, New York, 2010.

## **IT12A3**

## **COMPONENT BASED TECHNOLOGY**

**3 0 0 3**

### **AIM**

To learn different software components and their applications.

### **OBJECTIVES**

- To understand the Fundamental properties of components, technology, architecture and middleware.
- Detailed study of Component Frameworks and Development
- In-depth learning of JAVA, .NET Components and their Testing.

### **UNIT I INTRODUCTION**

**9**

Software Components – Component Definition, Interfaces, Platforms, Component Composition- Forms of composition, Interoperation, composition Mismatches, Component Attributes – Functionality, interactivity, interaction, concurrency, distribution, adaptation, quality control, Component Taxonomy, Component Examples – Java, Unix Filters, FrameMaker, Field, Component Engineering – Component Development, Generalization, Certification, Repositories, Classification.

### **UNIT II JAVA BASED COMPONENT TECHNOLOGIES**

**9**

Netbeans – Configuring Netbeans for Java EE development, Deploying applications, Netbeans for effective development, Web applications with Servlets and JSPs, Web applications with JavaServer Faces 2.0, Interfacing with Databases through the Java Persistence API.

### **UNIT III .NET BASED COMPONENT TECHNOLOGIES**

**9**

Component Oriented Programming – Introduction, Principles, Developing .NET components, .NET component-oriented programming essentials, Interface-based programming.

#### **UNIT IV COMPONENT FRAMEWORKS AND DEVELOPMENT 9**

Java Component Frameworks - Context and Dependency Injection, Messaging with JMS and Message driven Beans, JAX-WS, JAX-RS, .NET Component Frameworks - working with .NET events, Asynchronous programming models, Multithreading and concurrency management, Remote applications.

#### **UNIT V COMPONENT TESTING 9**

Component-Based Software Testing - Model-Based Development and Testing, Component-Based and Model-Driven Development with UML - Principles of Kobra Method, Context Realization, Component Specification, component Realization, Component Embodiment, Product Family Concepts, Accessing Quality-Of-Service Contracts.

**TOTAL: 45 PERIODS**

#### **TEXT BOOK**

1. Johannes Sametinger, "Software Engineering with Reusable Components", Springer 2010.

#### **REFERENCES**

1. David r. Heffelfinger, "Java EE 6 Development with NetBeans 7", Packt Publishing, 2011.
2. Juval Lowy, "Programming .NET Components: Design and Build .NET Using component-Oriented Programming", O'Reilly Media, 2nd Edition, 2009.
3. Hans-Gerhard Gross, "component-Based Software Testing with UML", Springer, 2010.
4. G. Sudha Sadasivam, "Component Based Technology", Wiley India, 2008.

### **IT12A4 EMBEDDED SYSTEMS 3 0 0 3**

#### **AIM**

To give sufficient background for undertaking embedded system design

#### **OBJECTIVES**

1. To allow the student to undertake the design and development process for embedded computer systems
2. To expose the students to the fundamentals of sequential Input/output memory management
3. To understand the process and real time operating system concepts
4. To know how to integrate embedded hardware, software, and operating systems to meet the functional requirements of embedded applications.
5. Become familiar with complete design and development of embedded systems.

#### **UNIT I INTRODUCTION 9**

Introduction to Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and programming.



**UNIT II MEMORY AND INPUT / OUTPUT MANAGEMENT 9**  
Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.

**UNIT III PROCESSES AND OPERATING SYSTEMS 9**  
Multiple tasks and processes – Context switching – Scheduling policies – Inter process communication mechanisms – Performance issues.

**UNIT IV EMBEDDED SOFTWARE 9**  
Programming embedded systems in assembly and Keil C – Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers.

**UNIT V EMBEDDED SYSTEM DEVELOPMENT 9**  
Design issues and techniques – Case studies – Complete design of example embedded systems.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Wayne Wolf, “Computers as Components: Principles of Embedded Computer System Design”, Elsevier, 2012.
2. Michael J. Pont, “Embedded C”, Pearson Education, 2015.

**REFERENCE**

1. Steve Heath, “Embedded System Design”, Elsevier, 2008. Muhammed Ali Mazidi, Janice Gillispie Mazidi and Rolin D. McKinlay, “The 8051 Microcontroller and Embedded Systems”, Pearson Education, Second edition, 2007.

**IT12A5 C# AND .NET PROGRAMMING 3 0 0 3**

**AIM**

To cover the fundamental concepts of the C# language and the .NET framework.

**OBJECTIVES**

- To understand the fundamental concepts of the C# language and the .NET framework.
- To understand the foundations of CLR execution
- To know the object oriented aspects of C# and to be aware of application development in .NET
- To learn web based applications on .NET (ASP.NET)

**UNIT I INTRODUCTION TO C# 9**

Introduction to C# and .NET, Literals, Variables, Data Types, Operators, checked and unchecked operators, Expressions, Branching, Looping, Methods, implicit and explicit casting, Constant, Arrays, Array Class, Array List, String, String Builder, Structure, Enumerations, boxing and unboxing.

**UNIT II OBJECT ORIENTED ASPECTS OF C# 9**

Class, Objects, Constructors and its types, inheritance, properties, indexers, index overloading, polymorphism, sealed class and methods, interface, abstract class, abstract and interface, operator overloading, delegates, events, errors and exception, Threading.

**UNIT III APPLICATION DEVELOPMENT ON .NET 9**

Building windows application, Creating our own window forms with events and controls, menu creation, inheriting window forms, SDI and MDI application, Windows Presentation Format(WPF), Dialog Box(Modal and Modeless), accessing data with ADO.NET, DataSet, typed dataset, Data Adapter, updating database using stored procedures, SQL Server with ADO.NET, handling exceptions, validating controls, windows application configuration.

**UNIT IV : WEB BASED APPLICATION DEVELOPMENT ON .NET 9**

Programming web application with web forms, ASP.NET introduction, working with XML and .NET, Creating Virtual Directory and Web Application, session management techniques, web.config, web services, passing datasets, returning datasets from web services, handling transaction, handling exceptions, returning exceptions from SQL Server.

**UNIT V : CLR AND .NET FRAMEWORK 9**

Assemblies, Versioning, Attributes, reflection, viewing meta data, type discovery, reflection on type, marshalling, remoting, security in .NET

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata Mc Graw Hill, 2012.
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.

AULibrary.com

**REFERENCES**

1. Andrew Troelsen , "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.
2. Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition, O'Reilly, 2010.

**IT12A6 SOFTWARE TESTING 3 0 0 3**

**AIM**

To make students understand the principles of software testing

**OBJECTIVES**

- To expose the criteria for test cases.
- To learn the design of test cases.
- Be familiar with test management and test automation techniques.
- Be exposed to test metrics and measurements.

## **UNIT I INTRODUCTION 9**

Testing as an Engineering Activity – Testing as a Process – Testing axioms – Basic definitions – Software Testing Principles – The Tester’s Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support of Developing a Defect Repository – Defect Prevention strategies.

## **UNIT II TEST CASE DESIGN 9**

Test case Design Strategies – Using Black Box Approach to Test Case Design – Random Testing – Requirements based testing – Boundary Value Analysis – Equivalence Class Partitioning – State-based testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – code complexity testing – Evaluating Test Adequacy Criteria.

## **UNIT III LEVELS OF TESTING 9**

The need for Levers of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing – Compatibility testing – Testing the documentation – Website testing.

## **UNIT IV TEST MANAGEMENT 9**

People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process – Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

## **UNIT V TEST AUTOMATION 9**

Software test automation – skill needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation – Test metrics and measurements – project, progress and productivity metrics.

**TOTAL: 45 PERIODS**

### **TEXT BOOKS**

1. Srinivasan Desikan and Gopalaswamy Ramesh, “Software Testing – Principles and Practices”, Pearson Education, 2006.
2. Ron Patton, “Software Testing”, Second Edition, Sams Publishing, Pearson Education, 2007

### **REFERENCES**

1. Ilene Burnstein, “Practical Software Testing”, Springer International Edition, 2003.

2. Edward Kit,” Software Testing in the Real World – Improving the Process”, Pearson Education, 1995.
3. Boris Beizer,” Software Testing Techniques” – 2nd Edition, Van Nostrand Reinhold, New York, 1990.
4. Aditya P. Mathur, “Foundations of Software Testing \_ Fundamental Algorithms and Techniques”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008.

**IT12A7**

**ELECTRONICS COMMERCE**

**3 0 0 3**

**AIM**

To understand the E-Commerce.

**OBJECTIVES**

- To describe E-Commerce Framework.
- To understand E-market Places.
- To explain Retailing and Online Advertising.
- To understand E-Commerce Applications.
- To understand Electronic Payment Systems and launch a successful online business.

**UNIT I OVERVIEW OF ELECTRONIC COMMERCE**

**9**

Definitions and concepts, Electronic Commerce Framework, Electronic Commerce Business Plans, Cases and Models, Benefits and Limitations of Electronic Commerce.

**UNIT II E-MARKET PLACES**

**9**

Electronic Market Places, Types of Electronic Markets, The Role and Value of Intermediaries, Electronic Catalogs and other Market Mechanisms, Auctions as EC Market Mechanisms, Bartering and Negotiating Online, E-Commerce in the Wireless Environment, Issues in E-Markets.

**UNIT III RETAILING IN ELECTRONIC COMMERCE AND ONLINE ADVERTISING**

**9**

Internet Marketing and Electronic Retailing, E-Tailing Business Models, Web Advertising, Advertising Methods, Advertising Strategies and Promotions, Economics of advertising

**UNIT IV E-SUPPLY CHAINS, COLLABORATIVE COMMERCE AND E-COMMERCE APPLICATIONS**

**9**

E-Supply Chains, Supply Chain Problems and solutions, Collaborative Commerce, Corporate Portals, E-Government Overview, Implementing E-Government, Online Publishing, E-Books and Blogging, E-Learning

**UNIT V ELECTRONIC PAYMENT SYSTEMS AND LAUNCHING A SUCCESSFUL ONLINE BUSINESS**

**9**

Electronic payments, Electronic Cards and Smart Cards, E-cash and Innovative Payment methods, E-Checking, B2B Electronic Payments, E-Billing, Launching a Successful Online Business.

**TOTAL: 45 PERIODS**

## **TEXT BOOK**

1. Effraim Turban, David King, Jae Lee, Dennis Viehland, “Electronic Commerce: A Managerial Perspective”, Pearson Education, Fourth Edition, 2006

## **REFERENCES**

1. Kamalesh K. Bajaj, “E-Commerce: The Cutting Edge & Business”, Tata McGraw-Hill, 2003.
2. “Frontiers of Electronic Commerce”, Kalakota & Whinston, Pearson Education, 2002.
3. Brenda Kennan, “Managing your E-Commerce Business”, PHI, 2001.
4. “Electronic Commerce from Vision to Fulfillment”, PHI, Elias M. Awad, Feb-2003.
5. “Electronic Commerce – Framework, Technology and Application”, TMH, Bharat Bhaskar, 2003.
6. Effy Oz, “Foundations of E-Commerce”, PHI, 2001.
7. Jim A Carter, “Developing E-Commerce Systems”, PHI, 2001.

**IT12A8**

**BUILDING ENTERPRISE APPLICATIONS**

**3 0 0 3**

### **AIM:**

The subject focus on designing and developing high quality enterprise applications and other task related to it.

### **OBJECTIVES**

1. Familiarize with concept of Enterprise Analysis and Business Modeling.
2. Understand requirements validation, planning and estimation.
3. Design and document the application architecture.
4. Understand the importance of application framework and designing other application components.
5. Construct and develop different solution layers.
6. Perform Code review, Code analysis, build process.
7. Understand different testing involved with enterprise application and the process of rolling out an enterprise application.

### **UNIT I**

**9**

Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications, Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation.

### **UNIT II**

**9**

Use case modeling, prototyping, non functional requirements, requirements validation, planning and estimation, Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture- design, different technical layers, best practices, data architecture and design – relational

**UNIT III****9**

XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design

**UNIT IV****9**

Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage

**UNIT V****9**

Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Raising Enterprise Applications – Published by John Wiley, authored by Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu
2. Building Java Enterprise Applications – Published by O'Reilly Media, authored by Brett McLaughlin

**REFERENCES**

1. Software Requirements: Styles & Techniques – published by Addison-Wesley Professional
2. Software Systems Requirements Engineering: In Practice – published by McGraw-Hill/Osborne Media
3. Managing Software Requirements: A Use Case Approach, 2/e – published by Pearson

**IT12A9****DATA WAREHOUSING & DATA MINING****3 0 0 3****AIM**

To serve as an introductory course to under graduate students with an emphasis on the design aspects of Data Warehousing and Data Mining.

**OBJECTIVES**

- To introduce the concept of data warehousing with special emphasis on architecture and design.
- To introduce the concept of data mining with in detail coverage of basic techniques and applications. Core topics like classification, clustering and association rules are exhaustively dealt with.

**UNIT I INTRODUCTION TO DATA WAREHOUSING 7**

Data Warehouse – Differences between OLTP and OLAP - Multidimensional Data Model - Data Warehouse Architecture – Data Warehouse Tools and Utilities- Metadata Repository - Data Warehouse Implementation.

**UNIT II INTRODUCTION TO DATA MINING, DATA PREPROCESSING AND DATA MINING PRIMITIVES 9**

Introduction to Data mining - Data – Types of Data - Classification of Data Mining Systems - Data Mining Functionalities - Integration of a Data Mining System with a Data Warehouse - Need for Preprocessing – Cleaning – Integration – Transformation – Reduction - Data Mining Primitives - Interestingness of Patterns - Relation to Statistics.

**UNIT III ASSOCIATION RULES AND CORRELATION ANALYSIS 9**

Association Rule Mining - Mining Single Dimensional Boolean Association Rules from Transactional Databases - Mining various kinds of Association Rules - Correlation Analysis.

**UNIT IV CLASSIFICATION AND CLUSTERING 11**

Classification and Prediction – Issues - Decision Tree Induction - Bayesian Classification - Classification by Backpropagation – Prediction - Classifier Accuracy - Cluster Analysis - Types of data - Categorization of major clustering methods - Partitioning methods - Hierarchical methods- Outlier Analysis.

**UNIT V APPLICATIONS AND TOOLS 9**

Data Mining Applications - Mining Time Series Data - Mining Sequence Patterns in Transactional Databases - Mining Sequence Patterns in Biological Data - Microsoft’s OLE DB for Data Mining.

**TOTAL: 45 PERIODS**

**TEXT BOOK**

1. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, Third Edition, Elsevier, 2012.

**REFERENCES**

1. Alex Berson, Stephen J.Smith, “Data Warehousing, Data Mining and OLAP”, Tata McGraw-Hill Edition, Thirteenth Reprint 2008.
2. G. K. Gupta, “Introduction to Data Mining with Case Studies”, Eastern Economy Edition, Prentice Hall of India, 2006.
3. K.P. Soman, Shyam Diwakar and V. Aja, “Insight into Data Mining Theory and Practice”, Eastern Economy Edition, Prentice Hall of India, 2006.
4. Daniel T.Larose, “Data Mining Methods and Models”, Wiley-Interscience, 2006.
5. Margaret H.Dunham, “Data Mining: Introductory and Advanced Topics”, Pearson Education 2006.
6. Sam Anahory, Dennis Murray, “Data Warehousing in the real world”, Pearson Education 2004

**AIM**

To create analytical skills, to enable the students to design algorithms for various applications, and to analyze the algorithms.

**OBJECTIVES**

- To develop proficiency in problem solving and programming.
- To analyze the performance of various algorithms in terms of time and space complexity
- To get a good understanding about various algorithmic and design techniques so that students are emphasized to develop new algorithms.

**UNIT I      ALGORITHM ANALYSIS      9**

Algorithm Analysis – Time Space Tradeoff – Asymptotic Notations – Conditional asymptotic notation – Removing condition from the conditional asymptotic notation - Properties of big-Oh notation – Recurrence equations – Solving recurrence equations – Analysis of linear search.

**UNIT II      DIVIDE AND CONQUER      9**

Divide and Conquer: General Method – Binary Search – Finding Maximum and Minimum – Merge Sort – Greedy Algorithms: General Method – Container Loading – Knapsack Problem.

**UNIT III      DYNAMIC PROGRAMMING      9**

Dynamic Programming: General Method – Multistage Graphs – All-Pair shortest paths – Optimal binary search trees – 0/1 Knapsack – Travelling salesperson problem .

**UNIT IV      BACKTRACKING      9**

Backtracking: General Method – 8 Queens problem – sum of subsets – graph coloring – Hamiltonian problem – knapsack problem.

**UNIT V      GRAPH TRAVERSALS      9**

Graph Traversals – Connected Components – Spanning Trees – Biconnected components – Branch and Bound: General Methods (FIFO & LC) – 0/1 Knapsack problem – Introduction to NP-Hard and NP-Completeness.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Ellis Horowitz, SartajSahni and SanguthevarRajasekaran, Computer Algorithms/ C++, Second Edition, Universities Press, 2008. (For Units II to V)
2. K.S. Easwarakumar, Object Oriented Data Structures using C++, Vikas Publishing House pvt. Ltd., 2000 (For Unit I)

**REFERENCES**

1. T. H. Cormen, C. E. Leiserson, R.L.Rivest, and C. Stein, "Introduction to Algorithms", Second Edition, Prentice Hall of India Pvt. Ltd, 2003.



2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education, 1999.

**IT12B1 TELECOMMUNICATION SYSTEMS 3 0 0 3**

**AIM**

To gain knowledge about microwave, satellite, optical, wireless and cellular communication systems.

**OBJECTIVES**

- To have knowledge about characteristics of Transmission lines, antennas, wave propagation, microwave devices and radar principles.
- To study about the fundamentals of satellite communication
- To gain brief knowledge about optical communication
- To learn the basics of Wireless voice and data communications technologies.
- To understand the essentials of cellular communication systems.

**UNIT I METHODS OF COMMUNICATION 9**

Transmission lines – Types and Characteristics, Antenna Fundamentals – Different types of antennas & their Characteristics, Radio Frequency wave propagation- Microwave –Principles, Devices (Reflex Klystron, Magnetron, TWT)-(Principles Only) Radar - Pulsed Radar - CW Radar (Principles and Block Diagram Only).

**UNIT II SATELLITE COMMUNICATIONS 9**

Satellite orbits- Satellite communication systems –Earth stations- Applications: Surveillance, Navigation, Mobile Communication, TV Broadcast, Satellite Radio, Satellite Telephone-Satellite multiple accessing arrangements: FDM/FM satellite systems, Multiple accessing, Channel capacity.

**UNIT III FIBER OPTIC COMMUNICATION 9**

Light wave communication systems – Fiber structure and function- Types of Fiber – Optical Transmitters & Receivers –Fiber optic Data communication systems.

**UNIT IV WIRELESS COMMUNICATION 9**

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

**UNIT V CELLULAR RADIO 9**

Citizen's band Radio, Cordless Telephone, Improved Mobile Telephone service (IMTS), Introduction to Advanced Mobile Phone Service (AMPS), GSM – RF channels and time slots – Voice transmission – Frequency Hopping - Subscriber ID module – GSM Privacy and Security – IS-95 CDMA PCS – Channels – Forward Channel – Reverse Channel – Voice Coding – Power Control – Hand-off and CDMA Security.

**TOTAL: 45 PERIODS**

## **TEXT BOOKS**

1. Louis E. Frenzel, "Communication Electronics – Principles and Application", 3<sup>rd</sup> Edition, Tata McGraw-Hill, 2002
2. William Stallings, "Wireless Communications and Networks", PHI/Pearson Education, 2<sup>nd</sup> edition, 2009.
3. Roy Blake, "Wireless Communication Technology", Thomson Delmar Learning, Second Reprint, 2002

## **REFERENCES**

1. George Kennedy, Bernard Davis and SRM Prasanna, "Electronic Communication Systems" 5<sup>th</sup> Edition, Tata McGraw-Hill, 2012
2. Dennis Roddy and John Coolen, "Electronic Communications" 4<sup>th</sup> Edition Pearson Education, 2011
3. Wayne Tomasi, "Electronic Communication systems" 5<sup>th</sup> Edition, Pearson Education, 2004.
4. Marin Cole, "Introduction to Telecommunications –Voice, Data and Internet", Pearson Education, 2001.

## **IT12B2 MULTIMEDIA COMPRESSION AND COMMUNICATION TECHNIQUES**

**3 0 0 3**

### **AIM**

Develop theoretical foundations of data compression, concepts and algorithms for lossy and lossless data compression, signal modeling and its extension to compression with applications to speech, image and video processing.

### **OBJECTIVES**

- Understand error-control coding.
- Understand encoding and decoding of digital data streams.
- Be familiar with the methods for the generation of these codes and their decoding techniques.
- Be aware of compression and decompression techniques.
- Learn the concepts of multimedia communication.

### **UNIT I MULTIMEDIA COMPONENTS**

**9**

Introduction – Multimedia skills – Multimedia components and their characteristics – Text, sound, images, graphics, animation, video, hardware.

### **UNIT II TEXT AND IMAGE COMPRESSION**

**9**

Compression principles-source encoders and destination encoders-lossless and lossy compression-entropy encoding –source encoding -text compression – static Huffman coding dynamic coding –arithmetic coding –Lempel Ziv-Welsh Compression-image compression.

### **UNIT III AUDIO AND VIDEO COMPRESSION**

**9**

Audio compression–DPCM-Adaptive PCM –adaptive predictive coding-linear Predictive coding-code excited LPC-perpetual coding Video compression –principles-H.261-H.263-MPEG 1, 2, and 4.

#### **UNIT IV VOIP TECHNOLOGY**

**9**

Basics of IP transport, VoIP challenges, H.323/ SIP –Network Architecture, Protocols, Call establishment and release, VoIP and SS7, Quality of Service- CODEC Methods- VOIP applicability.

#### **UNIT V MULTIMEDIA NETWORKING**

**9**

Multimedia networking -Applications-streamed stored and audio-making the best Effort service-protocols for real time interactive Applications-distributing multimedia-beyond best effort service-secluding and policing Mechanisms-integrated services-differentiated Services-RSVP.

**TOTAL: 45 PERIODS**

#### **TEXT BOOKS**

1. Fred Halshall “Multimedia Communication – Applications, Networks, Protocols and Standards”, Pearson Education, 2007.
2. R. Steimnetz, K. Nahrstedt, “Multimedia Computing, Communications and Applications”, Pearson Education Ranjan Parekh, “Principles of Multimedia”, TMH 2007.
3. Kurose and W.Ross” Computer Networking “a Top down Approach, Pearson Education 2005.

#### **REFERENCES**

1. Marcus Goncalves “Voice over IP Networks”, Mc Graw Hill 1999.
2. KR. Rao,Z S Bojkovic, D A Milovanovic, “Multimedia Communication Systems: Techniques, Standards, and Networks”, Pearson Education 2007.

#### **IT12B3**

#### **AD HOC AND SENSOR NETWORKS**

**3 0 0 3**

#### **AIM**

To provide the concepts, network architectures, protocol design issues and applications of ad hoc and wireless sensor networks.

#### **OBJECTIVES**

- Understand the design issues in ad hoc and sensor networks.
- Learn the different types of MAC protocols.
- Study the different types of adhoc routing protocols.
- Understand the TCP issues in adhoc networks.
- Learn the architecture and protocols of wireless sensor networks.

#### **UNIT I INTRODUCTION**

**9**

Fundamentals of Wireless Communication Technology – The Electromagnetic Spectrum – Radio Propagation Mechanisms – Characteristics of the Wireless Channel – Mobile Ad hoc Networks (MANETs) and Wireless Sensor Networks (WSNs) : Concepts and Architectures. Applications of Ad hoc and Sensor Networks. Design Challenges in Ad hoc and Sensor Networks.

## **UNIT II MAC PROTOCOLS FOR AD HOC WIRELESS NETWORKS 9**

Issues in designing a MAC Protocol – Classification of MAC Protocols – Contention based protocols – Contention based protocols with Reservation Mechanisms – Contention based protocols with Scheduling Mechanisms – Multi channel MAC – IEEE 802.11 and its variants.

## **UNIT III ROUTING PROTOCOLS AND TRANSPORT LAYER IN AD HOC WIRELESS NETWORKS 9**

Issues in designing a Routing and Transport Layer protocol for Ad hoc Networks – Proactive routing, Reactive routing (on-demand), Hybrid routing – Classification of Transport Layer solutions – TCP over Ad hoc Wireless Networks.

## **UNIT IV WIRELESS SENSOR NETWORKS AND MAC PROTOCOLS 9**

Single node Architecture: Hardware and Software Components of a Sensor Node – WSN Network Architecture: Typical Network Architectures – Data Relaying and Aggregation Strategies – MAC layer Protocols: Self-organizing, Hybrid TDMA/FDMA and CSMA based MAC – IEEE 802.15.4.

## **UNIT V WSN ROUTING, LOCALIZATION & QOS 9**

Issues in WSN routing – OLSR- Localization – Indoor and Sensor Network Localization – Absolute and Relative Localization, Triangulation – QOS in WSN – Energy Efficient Design – Synchronization – Transport Layer issues.

**TOTAL: 45 PERIODS**

### **TEXT BOOK**

1. C. Siva Ram Murthy, and B. S. Manoj, “Ad hoc Wireless Networks: Architectures and Protocols”, Prentice Hall Professional Technical Reference, 2008.

### **REFERENCES**

1. Carlos De Morais Cordeiro and Dharma Prakash Agrawal, “Ad Hoc & Sensor Networks: Theory and Applications”, Second Edition, World Scientific Publishing Company, 2011.
2. Feng Zhao and Leonides Guibas, “Wireless Sensor Networks”, Elsevier Publication, 2002.
3. Holger Karl and Andreas Willig, “Protocols and Architectures for Wireless Sensor Networks”, John Wiley, 2005.
4. Prasant Mohapatra and Srihanamurthy, “Ad Hoc Networks Technologies and Protocols”, Springer, Springer International Edition, 2009.
5. Anna Hac, “Wireless Sensor Network Designs”, John Wiley, 2003.
6. Kazem Sohraby, Daniel Minoli and Taieb Znati, “Wireless Sensor Networks – Technology, Protocols, and Applications”, John Wiley, 2007.

**IT12B4**

**DATA ANALYTICS**

**3 0 0 3**

### **AIM**

The aim is to provide exposure on big data, to understand the foundational skills in data analytics and study the techniques for determining the patterns and structures within the raw data.

## **OBJECTIVES**

- Be exposed to big data
- Learn the different ways of Data Analysis
- Be familiar with data streams
- Learn the mining and clustering
- Be familiar with the visualization

### **UNIT I INTRODUCTION TO BIG DATA 8**

Introduction to Big Data Platform – Challenges of conventional systems - Web data – Evolution of Analytic scalability, analytic processes and tools, Analysis vs reporting - Modern data analytic tools, Statistical concepts: Sampling distributions, resampling, statistical inference, prediction error.

### **UNIT II DATA ANALYSIS 12**

Regression modeling, Multivariate analysis, Bayesian modeling, inference and Bayesian networks, Support vector and kernel methods, Analysis of time series: linear systems analysis, nonlinear dynamics - Rule induction - Neural networks: learning and generalization, competitive learning, principal component analysis and neural networks; Fuzzy logic: extracting fuzzy models from data, fuzzy decision trees, Stochastic search methods.

### **UNIT III MINING DATA STREAMS 8**

Introduction to Streams Concepts – Stream data model and architecture - Stream Computing, Sampling data in a stream – Filtering streams – Counting distinct elements in a stream – Estimating moments – Counting oneness in a window – Decaying window - Realtime Analytics Platform(RTAP) applications - case studies - real time sentiment analysis, stock market predictions.

### **UNIT IV FREQUENT ITEMSETS AND CLUSTERING 9**

Mining Frequent itemsets - Market based model – Apriori Algorithm – Handling large data sets in Main memory – Limited Pass algorithm – Counting frequent itemsets in a stream – Clustering Techniques – Hierarchical – K- Means – Clustering high dimensional data – CLIQUE and PROCLUS – Frequent pattern based clustering methods – Clustering in non-euclidean space – Clustering for streams and Parallelism.

### **UNIT V FRAMEWORKS AND VISUALIZATION 8**

MapReduce – Hadoop, Hive, MapR – Sharding – NoSQL Databases - S3 - Hadoop Distributed file systems – Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications.

**TOTAL: 45 PERIODS**

## **TEXT BOOKS**

1. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.
2. Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Press, 2012.

## REFERENCES

1. Bill Franks, Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with advanced analytics, John Wiley & sons, 2012.
2. Glenn J. Myatt, Making Sense of Data, John Wiley & Sons, 2007 Pete Warden, Big Data Glossary, O'Reilly, 2011.
3. Jiawei Han, Micheline Kamber "Data Mining Concepts and Techniques", Second Edition, Elsevier, Reprinted 2008.

## IT12B5 FREE AND OPEN SOURCE SOFTWARE

3 0 0 3

### AIM

To explore the philosophy of open source software and the various license models in use and to cover the fundamental concepts of open source operating system (Linux), database (MySQL), HTML scripting language (PHP), and general purpose scripting language (Perl).

### OBJECTIVES

1. Define open source software
2. Identify and discuss various software licensing models
3. Understand the motivation, theory, strengths and weaknesses of open source software.
4. Become familiar with
  - Linux
  - MySQL
  - PHP
  - Perl

### UNIT I INTRODUCTION

9

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources– Application of Open Sources. Open source operating systems: LINUX: Introduction – General Overview – Kernel Mode and user mode – Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals – Development with Linux. .

### UNIT II OPEN SOURCE DATABASE

9

MySQL: Introduction – Setting up account – Starting, terminating and writing your ownSQL programs – Record selection Technology – Working with strings – Date and Time– Sorting Query Results – Generating Summary – Working with metadata – Usingsequences– MySQL and Web.

### UNIT III OPEN SOURCE PROGRAMMING LANGUAGES

9

PHP: Introduction – Programming in web environment – variables – constants – data;types – operators – Statements – Functions – Arrays – OOP – String Manipulation and regular expression – File handling and data storage – PHP and SQL database – PHP and LDAP – PHP Connectivity – Sending and receiving E-mails – Debugging and error handling – Security – Templates.

**UNIT IV PYTHON****9**

Syntax and Style – Python Objects – Numbers – Sequences – Strings – Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules – Classes and OOP – Execution Environment.

**UNIT V PERL****9**

Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures – Subroutines, Packages, and Modules- Working with Files –Data Manipulation.

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003
2. Steve Suchring, “MySQL Bible”, John Wiley, 2002
3. Martin C. Brown, “Perl: The Complete Reference”, 2<sup>nd</sup> Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4. Brian Heinold, ”Introduction to Programming Using Python”, Mount St. Mary's University Publication, 2013
5. Steven Holzner, “PHP: The Complete Reference”, 2<sup>nd</sup> Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

**REFERENCE**

1. Vikram Vaswani, “MYSQL: The Complete Reference”, 2<sup>nd</sup> Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

**IT12B6 WEB ENGINEERING****3 0 0 3****AIM**

To understand the characteristics of web applications

**OBJECTIVES**

1. Learn to Model web applications
2. Be aware of Systematic methods
3. Be familiar with the testing techniques for web applications.

**UNIT I INTRODUCTION TO WEB ENGINEERING AND REQUIREMENTS ENGINEERING 9**

Motivation, Categories of Web Applications, Characteristics of Web Applications, Product-related Characteristics, Usage related Characteristics, Development-related Characteristic, Evolution of web engineering - Requirements Engineering Activities RE Specifics in Web Engineering, Principles for RE of Web Applications, Adapting RE Methods to

Web Application Development, Requirement Types, Notations, Tools

**UNIT II WEB APPLICATION ARCHITECTURES & MODELLING WEB APPLICATIONS 10**

Introduction- Categorizing Architectures, Specifics of Web Application Architectures, Components of a Generic Web Application Architecture, Layered Architectures, 2-Layer Architectures, N-Layer Architectures Data-aspect Architectures, Database-centric Architectures, Architectures for Web Document Management, Architectures for Multimedia Data Modeling Specifics in Web Engineering, Levels, Aspects, Phases Customization, Modeling Requirements, Hypertext Modeling, Hypertext Structure Modeling Concepts, Access Modeling Concepts, Relation to Content Modeling, Presentation Modeling, Relation to Hypertext Modeling, Customization Modeling, Relation to Content, Hypertext, and Presentation Modeling

**UNIT III WEB APPLICATION DESIGN 10**

Introduction, Web Design from an Evolutionary Perspective, Information Design, Software Design: A Programming Activity, Merging Information Design and Software Design, Problems and Restrictions in Integrated Web Design, A Proposed Structural Approach, Presentation Design, Presentation of Nodes and Meshes, Device-independent Development, Approaches, Inter action Design, User Interaction User Interface Organization, Navigation Design, Designing a Link Representation, Designing Link Internals, Navigation and Orientation, Structured Dialog for Complex Activities, Interplay with Technology and Architecture, Functional Design.

**UNIT IV TESTING WEB APPLICATIONS 8**

Introduction, Fundamentals, Terminology, Quality Characteristics, Test Objectives, Test Levels, Role of the Tester, Test Specifics in Web Engineering, Test Approaches, Conventional Approaches, Agile Approaches, Test Scheme, Three Test Dimensions, Applying the Scheme to Web Applications, Test Methods and Techniques, Link Testing, Browser Testing, Usability Testing, Web Vulnerabilities Detection and Testing ,Load, Stress and Continuous Testing, Testing Security, Test-driven Development, Test Automation, Benefits and Drawbacks of Automated Test, Test Tools

**UNIT V WEB PROJECT MANAGEMENT 8**

Understanding Scope, Refining Framework Activities, Building a Web Team, Managing Risk, Developing a Schedule, Managing Quality, Managing Change, Tracking the Project. Introduction to node JS - web sockets.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Roger.S.Pressman, David Lowe, “Web Engineering : A Practitioner’s Approach”, Tata McGraw Hill Publication, First edition,2008.
2. Gerti Kappel, Birgit Proll, Siegfried Reich, Werner Retschitzegger, “Web Engineering”-The Discipline of Systematic Development of Web Applications, John Wiley and Sons Ltd, 2006.
3. Guy W. Lecky-Thompson, “Web Programming”, Cengage Learning, 2008.



## REFERENCES

1. Chris Bates, “Web Programming: Building Internet Applications”, Third Edition, Wiley India Edition, 2007 .
2. John Paul Mueller, “Web Development with Microsoft Visual Studio 2005”, Wiley Dream tech, 2006.

## IT12B7 TCP/IP DESIGN AND IMPLEMENTATION 3 0 0 3

### AIM

To study about the internetworking concepts and functionalities of different protocols.

### OBJECTIVES

- To understand the internals of TCP/IP protocols and its implementation.
- To understand the interaction among different protocols.

## UNIT I TCP/IP PROTOCOLS 9

Overview of TCP/IP Protocol: Internet Protocol-Header, Routing, Subnetting and Supernetting, ARP and RARP, Internet Control Message Protocol, User Datagram Protocol, IPV6, TCP-Services and Header, Connection Establishment and Termination, Interactive dataflow, Timeout and Retransmission, TCP Performance and Applications.

## UNIT II ELEMENTARY TCP AND UDP SOCKETS 9

Introduction to Socket Programming-Introduction to Sockets –Socket Address Structures-Byte Ordering Functions-Address Conversion Functions-Elementary TCP Sockets-socket, connect, bind, listen, accept, read, write, close functions- Interactive Server-Concurrent Server-Elementary UDP sockets-UDP Echo Server-UDP Echo Client.

## UNIT III APPLICATION DEVELOPMENT 9

TCP Echo Server-TCP Echo Client-Posix Signal Handling-Server with multiple clients-boundary conditions: Server Process Crashes, Server Host Crashes ,Server Crashes and reboots, Server Shutdown-I/O multiplexing-I/O Models-select function-shutdown function-TCP Echo Server(with multiplexing)-poll function-TCP Echo Client(with multiplexing)-Multiplexing TCP and UDP sockets.

## UNIT IV SOCKET OPTIONS , ADVANCED SOCKETS 9

Generic Socket Options-IP Socket Options-ICMP Socket Options-TCP Socket Options-Domain Name System-gethostbyname Function-IPv6 support in DNS-gethostbyadr Function-getservbyname and getservbyport functions-IPv4 and IPv6 Interoperability-Threaded Servers-Thread Creation and Termination-TCP Echo Server using Threads-Mutexes-Condition Variables-Raw Sockets-Ping Program-Traceroute Program

## UNIT V SIMPLE NETWORK MANAGEMENT 9

Mobile IP-Dynamic Host Configuration Protocol-Routing-DSDV-DSR-Alternative Metrics-Traditional TCP-Classical TCP improvements.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. W.Richard Stevens, “UNIX NETWORK PROGRAMMING Vol-1” Second Edition, PHI/Pearson Education,1998.
2. William Stallings. “SNMP, SNMPv2, SNMPv3 and RMON1 and 2”, Third Edition, Addison Wesley, 1999.
3. Benrouz.A.Forouzan, “TCP/IP Protocol Suite”, Second Edition, Tata MC Graw Hill, 2000.
4. Jochen Schiller,” Mobile Communications” ,PHI/Pearson Education, Second Edition,2003.

**REFERENCES**

1. D.E.Comer, “Internetworking with TCP/IP Vol-III”(BSD Sockets Version),second Edition,PHI,2003.
2. Mani Subramanian, “Network Management: Principles and Practice”, Addison Wesley,2000.

**IT12B8 SOFTWARE QUALITY ASSURANCE 3 0 0 3**

**Aim**

To provide an overview of software quality assurance and quality management standards. It focuses QA activities in software projects, processes and products.

**OBJECTIVES**

- To understand quality management system and software quality assurance
- To understand and learn QMS models
- To understand the QA activities in process
- To understand the QA activities in product
- To interpret and communicate metric results

**UNIT I FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE 9**

Software Quality: Perspective and Expectations, Historical perspective of Quality, Views of quality, Quality Management System (QMS), Historical perspective of QMS, QMS for software, Quality Assurance, 7 QC Tools and Modern Tools, Zero Defect, Six Sigma.

**UNIT II MANAGING SOFTWARE QUALITY 9**

Managing Software Organizations – Managing Software Quality – Defect Prevention Software Quality Assurance Management

**UNIT III SOFTWARE QUALITY ASSURANCE METRICS 9**

Software Quality – Total Quality Management (TQM) – Quality Metrics –Process metrics – Product metrics– Software Quality Metrics Analysis.

## **UNIT IV SOFTWARE QUALITY PROGRAM**

**9**

Software Quality Program Concepts – Establishment of a Software Quality Program– Software Quality Assurance Planning – An Overview – Purpose & Scope–Quality models.

## **UNIT V SOFTWARE QUALITY ASSURANCE STANDARDIZATION**

**9**

Software Standards–ISO 9001 Quality System Standards - Capability Maturity Model and the Role of SQA in Software Development Maturity – SEI CMM Level 5 – Comparison of ISO 9000 Model with SEI’s CMM,SPICE model, Bootstrap methodology

**TOTAL: 45 PERIODS**

### **TEXT BOOKS**

1. Rohit khurana, “software engineering and quality assurance”, Vikas Publishing,2010
2. Mordechai Ben-Menachem / Garry S Marliss, “Software Quality”, BS Publications; 2nd edition (2014)
3. Watts S Humphrey, “ Managing the Software Process”, Pearson Education Inc.,1989
4. Stephen H.Kin, “Metric and Models in Software Quality Engineering”, Addison Wesley, 2003.

### **REFERENCES**

1. Gordon G Schulmeyer, “Handbook of Software Quality Assurance”, Third Edition, Artech House Publishers ,2007
2. Nina S Godbole, “Software Quality Assurance: Principles and Practice”, Alpha Science International, Ltd, 2004
3. Daniel Galin, “Software Quality Assurance”, Pearson Publication, 2009.
4. Alan C. Gillies, “Software Quality: Theory and Management”, International Thomson Computer Press, 1997.

**IT12B9**

## **SOFTWARE PROJECT MANAGEMENT**

**3 0 0 3**

**Aim:** This course will explore the role of empiricism in software engineering research, and will prepare students for advanced research in SE by examining how to plan, conduct and report on empirical investigations.

### **OBJECTIVES**

- To understand the software automation process
- To be aware of the data gathering process in SPM

## **UNIT I INTRODUCTION AND SOFTWARE PROJECT PLANNING**

**9**

Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan,

Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

## **UNIT II PROJECT ORGANIZATION AND SCHEDULING 9**

Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.

## **UNIT III PROJECT MONITORING AND CONTROL 9**

Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Desk checks, Walkthroughs, Code Reviews, Pair Programming.

## **UNIT IV STAFFING IN SOFTWARE PROJECTS 9**

Managing people – Organizational behavior – Best methods of staff selection – Motivation – The Oldham-Hackman job characteristic model – Ethical and Programmed concerns – Working in teams – Decision making – Team structures – Virtual teams – Communications genres – Communication plans.

## **UNIT V PROJECT MANAGEMENT AND PROJECT MANAGEMENT TOOLS 9**

Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project.

**TOTAL: 45 PERIODS**

### **TEXTBOOKS**

1. Bob Hughes, Mikecoterrell, Software Project Management, Tata McGraw-Hill Publication, 5<sup>th</sup> edition, 2012.
2. Walker Royce, Software Project Management, Pearson Education, 1998
3. Kieron Conway, Software Project Management, Dreamtech Press, 2001
4. S. A. Kelkar, Software Project Management, PHI Publication, 2012

### **REFERENCES**

1. Humphrey, Watts: " Managing the software process ", Addison Wesley, 1989
2. Ramesh Gopaldaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
3. Roger S Pressman, " Software Engineering, A Practitioner's Approach" McGraw Hill Edition, New Delhi, 7<sup>th</sup> edition 2010.
4. Robert K. Wysocki "Effective Software Project Management" Wiley Publication, 2011.