1701MA101	ENGINEERING MATHEMATICS I (Common to all B.E / B.Tech Degree Programmes)	L 3	T 2	P 0	C 4

COURSE OBJECTIVES:

1. To educate Matrix Algebra Technique and curvature Theory
2. To impart knowledge of Techniques in solving Ordinary Differential Equations and to apply in solving Modern Engineering Problems
3. To acquaint the students about functions of several variables and also to familiarize the students in infinite series and their convergence

UNIT I EIGEN VALUE PROBLEMS **9 Hours**

Characteristic equation - Eigen values and Eigen vectors of a real matrix – Properties - Cayley– Hamilton theorem- Diagonalization of Matrices - Reduction of a quadratic form to a canonical form by orthogonal transformation – Application of Matrices in Structural Engineering and image processing

UNIT II ORDINARY DIFFERENTIAL EQUATIONS **9 Hours**

Higher order linear differential equations with constant coefficients – Cauchy's and Legendre's linear equations – Method of variation of parameters in solution of ordinary differential equations.

UNIT III DIFFERENTIATION AND GEOMETRICAL APPLICATIONS **9 Hours**

Derivative of special functions (Trigonometry, Exponential, Logarithmic), Derivative by rule (Product, Quotient, Chain rule), Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature- Evolutes and involutes.

UNIT IV MULTIVARIABLE CALCULUS **9 Hours**

Functions of two variables and solutions(Partial derivatives and Euler's theorem)– Taylor's series - Maxima and Minima – Application of Partial Derivatives to find the optimum requirement using Lagrangian multipliers.

UNIT V SEQUENCES AND SERIES **9 Hours**

Sequences: Definition and examples – Series: Types and Convergence – Series of positive terms – Tests of convergence: Comparison test, Integral test and D'Alembert's ratio test – Alternating series – Leibnitz's test – Application of Sequences in real life.

TOTAL: 45 + 15 HOURS

FURTHER READING:

1. Modeling and solutions using Newton's Law of Cooling of Bodies
2. Differentiation of implicit Functions, Jacobians and Properties

COURSE OUTCOMES: Skill development

On the Successful completion of the course, Students will be able to

CO1: Analyze the characteristics of a linear system with Eigen value and Eigen Vectors
CO2: Recognize and solve Higher order Ordinary Differential Equations
CO3: Solve Derivative of special functions and apply it in solving Geometrical problems
CO4: Apply Partial Derivatives in finding Maxima and Minima of a function
CO5: Test the convergence of any series

REFERENCES:

1. Veerarajan R., "Engineering Mathematics", updated second edition for semester I and II,(2017)
2. Grewal. B.S, "Higher Engineering Mathematics", 44th Edition, Khanna Publications, Delhi,(2014).
3. Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", Sixth edition, Laxmi Publications(p) Ltd.,(2014).
4. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, (2012).
5. P.Kandasamy, K. Gunavathy and K. Thilagavathy, Engineering Mathematics ,Volume II, S. Chand & Co ., New Delhi, (2009)
6. Erwin Kreyszig, Advanced Engineering Mathematics,9th Edition, Wiley International edition, (2006)
7. Ramana B.V, "Higher Engineering Mathematics",Tata McGrawHill Publishing, New Delhi, (2007).
8. M K Venkataraman, Engineering mathematics, Volume I, 2nd ed., National Publishing Co.(2003)
9. nptel.ac.in/courses/111105035, www.nptelvideos.in/2012/11/Mathematics.html
10. www.learnerstv.com/Free-maths-video lectures - ltv348-page1.htm

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1701PH101	APPLIED PHYSICS FOR ENGINEERS (Common to all B.E. / B.Tech Degree Programmes)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. To impart knowledge in properties of matter, crystallography and ultrasonics.
2. To understand the applications of lasers and fiber optics.
3. To implement the principles of quantum physics in the respective engineering fields.

UNIT I PROPERTIES OF MATTER **9 Hours**

Elasticity: elastic and plastic materials – Hooke's law – elastic behavior of a material – stress – strain diagram – factors affecting elasticity. Three moduli of elasticity – Poisson's ratio – torsional pendulum – twisting couple on a cylinder. Young's modulus – uniform bending – non-uniform bending. Viscosity: coefficient of viscosity – streamline and turbulent flow – experimental determination of viscosity of a liquid – Poiseuille's method.

UNIT II APPLIED OPTICS **9 Hours**

Interference: air wedge – theory – uses – testing of flat surfaces – thickness of a thin wire. Laser: introduction – principle of laser – characteristics of laser light– types: CO2 laser – semiconductor laser (homojunction). Fiber optics: principle of light transmission through fiber – expression for acceptance angle and numerical aperture – types of optical fibers (refractive index profile and modes) – fiber optic communication system (block diagram & description).

UNIT III ULTRASONICS **9 Hours**

Ultrasonics: introduction – properties of ultrasonic waves – generation of ultrasonic waves – magnetostriction - piezo electric methods – detection of ultrasonic waves – Determination of velocity of ultrasonic waves (acoustic grating). Applications of ultrasonic waves: pulse echo method, SONAR – measurement of velocity of blood flow – modes of operation (A scan, B Scan & C Scan).

UNIT IV SOLID STATE PHYSICS **9 Hours**

Crystal Physics: lattice – unit cell – crystal systems – Bravais lattices – Miller indices – 'd' spacing in cubic lattice – calculation of number of atoms per unit cell, atomic radius, coordination number and determination of packing density for SC, BCC, FCC and HCP structures – X-ray diffraction: Laue's method – powder crystal method.

UNIT V QUANTUM MECHANICS **9 Hours**

Quantum Physics: development of quantum theory – de Broglie wavelength – Schrodinger's wave equation – time dependent and time independent wave equations – physical significance. Application: particle in a box (1D) – degenerate and non-degenerate states. Electron Microscopy-SEM, TEM - principle and working – problem solving.

TOTAL: 45 HOURS

FURTHER READING:

Neutrino's – expanding universe

COURSE OUTCOMES: SKILL DEVELOPMENT

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

CO1: Realize the concept of properties of matter and apply the same for practical applications.
CO2: Identify the suitable laser source for fiber optic communication applications.
CO3: Determine the velocity of ultrasonic waves and apply the same for day today applications.
CO4: Classify the different types of crystal structures and analyze their properties.
CO5: Comprehend the efficacy of quantum equations in modern areas.

REFERENCES:

1. D.S.Mathur, Elements of Properties of matter, 5th edition, S.Chand & Company Ltd., New Delhi,2012.
2. Charles Kittel, Introduction to Solid State Physics, 8th edition, Wiley India Pvt. Ltd., New Delhi, 2012
3. Arthur Beiser, Shobhit Mahajan and S. Rai Choudhury, Concepts of Modern Physics, 6th edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2010.
4. B.K. Pandey and S. Chaturvedi, Engineering Physics, 1st edition, Cengage Learning India Pvt. Ltd., New Delhi, 2012.
5. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc, 2011.
6. Ian Morison, Introduction to Astronomy and Cosmology, John Wiley and Sons, Ltd, 2013.
7. http://nptel.ac.in/

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1701EN101	TECHNICAL ENGLISH (Common to all B.E / B.Tech Degree Programmes)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. To develop the ability to read and comprehend technical texts in the field of Engineering
2. To develop vocabulary building through the study of word construction
3. To develop ability to write formal definitions of technical terms and expression.
4. To recognize various grammatical structures that will aid the student improve his/her theoretical knowledge.

UNIT I **9 Hours**

Articles-Preposition-Subject-Verb-Object-Adjective-Adverb-Conjunction-Nouns- Usages of Have, has, had-Simple Present-Simple Past-Simple Future-Self introduction-Framing Questions

UNIT II **9 Hours**

Present Continuous-Past Continuous-Future Continuous-Describing a place, person or thing-Framing negative questions-Gerund-Listening to Articles, speeches and audios

UNIT III **9 Hours**

Present perfect-past perfect-future perfect-writing short paragraph-sentence pattern- Infinitive-Tag questions-Reading newspaper cutting

UNIT IV **9 Hours**

Present perfect continuous –Past perfect continuous-Future perfect continuous-writing an Essay in 100 words-Types of sentences-Prefix-suffix-word formation-Dialogue writing.

UNIT V **9 Hours**

Active voice-passive voice-impersonal passive voice –Synonyms and Antonyms-phrasal verbs- Punctuation-Common Errors-Letter writing.

TOTAL: 45 HOURS

FURTHER READING:

Letters from a Father to His Daughter- Jawaharlal Nehru

COURSE OUTCOMES: Skill Development

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

CO1: Read and comprehend technical texts in the field of Engineering

CO2: Acquire vocabulary building and write effectively in technical writing

CO3: Write formal definitions of technical terms and expression in both verbal and written form.

CO4: Understand grammatical structures and use flawless English in the professional documents

REFERENCES:

1. Meenakshi Raman, Sangeetha Sharma, "***Technical Communication : English Skills for Engineers***" Oxford University Press: New Delhi, 2016.
2. Rizvi Ashrav.M, "***Effective Technical Communication***" Tata McGraw Hill: New Delhi, 2017
3. Herbert, A.J, "***Structure of Technical English***", London English Language Society. https://archive.org/details/in.ernet.dli.2015.136456
4. J.D. O'Connor, Better ***English Pronunciation*** Paperback, 2nd edition, 162 pages, Published September 16th 2013 by Cambridge University Press,October 23rd 1967
5. Nehru, Jawaharlal. ***Letters from a Father to His Daughter***, Puffin Books, 2004
6. ***Technical English*** by faculty of English –published by EGS Pillay press 2017

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1701CH101	APPLIED CHEMISTRY IN INFORMATICS (Common to B.E. CSE & B.Tech. IT Programmes)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. Recall the terminologies of electrochemistry and explain the function of batteries and fuel cells.
2. Choose appropriate instrumentation technique for interpreting analytical data.
3. Understand the fundamentals of corrosion, its types and polymers with its applications with its electrochemical reactions.

UNIT I ELECTROCHEMISTRY **9 Hours**

Cell terminology-Electrochemical cells- Electrolytic cells- Cell reactions- Daniel cell-Difference between electrolytic cells and electrochemical cells. Reversible cells and irreversible cells -types- EMF series and its applications - Nernst equation (derivation and problems).Single electrode potential - Hydrogen electrode - Calomel electrode - Glass electrode - pH measurement using glass electrode.

UNIT II CORROSION AND ITS CONTROL **9 Hours**

Corrosion – types-chemical, electrochemical corrosion (galvanic, differential aeration) - factors influencing corrosion -corrosion control – material selection and design aspects - electrochemical protection – sacrificial anode method and impressed current cathodic method. protective coatings: electroplating of gold and electroless plating of nickel. paints - constituents and functions.

UNIT III NONCONVENTIONAL ENERGY RESOURCES AND STORAGE DEVICES **9 Hours**

Introduction- nuclear energy- nuclear fission, nuclear fusion- nuclear chain reactions- breeder reactor- Nuclear Reactor-solar energy conversion- solar cells- wind energy. Batteries and fuel cells: Types of batteries- alkaline battery- lead storage battery nickel- cadmium battery- lithium battery- fuel cell H2 -O2 fuel cell- applications

UNIT IV POLYMER AND ITS APPLICATION **9 Hours**

Introduction: Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Addition (Free Radical Mechanism) condensation and copolymerization. Fabrication of Plastics. Application –Conducting polymer.

UNIT V CHEM-INFORMATICS **9 Hours**

Definition – coordinate – Bonds - Bond length - Bond angles - Torsional angles -Polypeptide conformation and representation by Ramachandran map — Chemical structure — Conformation –Representation of structural information – Linear format - SMILEYS notation – MOL format – PDB format – Storage of structural data in a data base –Canonical structure – Similarity search – Sub structure search - Structural keys – Finger print - molecular data base-Cambridge structural database (protein data bank)-noting data bank-Application of chem-informatics in drugs designing.

TOTAL: 45 HOURS

FURTHER READING:

1. Alloys-ferrous and nonferrous alloys
2. Cambridge structural database (protein data bank)-noting data bank
3. Unique properties of nano material- introduction to quantum materials, quantum dots, supramolecular materials and molecular crystal engineering – molecular machines and devices-Logic gate using electronics material for molecular electronic

COURSE OUTCOMES: Skill Development

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

CO1: Construct an electrochemical cell and measure its potential
CO2: Identify the components and processes in batteries and infer the selection criteria for commercial battery systems with respect to different applications
CO3: Utilize electrochemical data to formulate an electrochemical half-cell and cell reactions for corrosion control processes
CO4: Differentiate the polymers used in day to day life based on its source, properties and applications
CO5: Identify the applications of analytical methods for the estimation of elements in aqueous media

REFERENCES:

1. Ashima Srivastava and Janhavi N N., "Concepts of Engineering Chemistry", ACME Learning Private Limited., New Delhi, 2010.
2. Ravikrishnan A., "Engineering Chemistry", Sri Krishna Hi-tech Publishing Company Pvt. Ltd. Chennai, 2016.
3. RenuBapna and Renu Gupta., "Engineering Chemistry", Macmillan India Publisher Pvt Ltd, 2010.
4. Willard Merritt and Dean Settle, Instrumental methods of analysis, CBS publishers, Seventh edition, 2012.
5. DaraS.S, Umare S.S."Engineering Chemistry", S. Chand & Company Ltd., New Delhi., 2010.
6. https://www.ccdc.cam.ac.uk/solutions/csd-system/components/csd/

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7. https://link.springer.com/chapter/10.1007/978-3-642-28030-6_2
8. www.santarosa.edu/~yataiiya/4D/QuantumDotsMk2.ppt
9. onlinelibrary.wiley.com/doi/10.1002/9780470661345.smc107/pods
10. https://en.wikipedia.org/wiki/Molecular_electronics.
11. Jain and Jain, "Engineering Chemistry", Sixteenth edition, Dhanpatrai publications, 2012.

1701GEX01 **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING** (Common to B.E. / B.Tech. – CSE, IT, CIVIL & MECH)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To introduce basic electrical terminologies and laws
2. To impart knowledge on solving series and parallel circuits
3. To introduce about the three phase system
4. To explain the working principle of dc and ac machines, power plants
5. To familiarize about basic electronic components, circuits, transducers, digital logic and communication systems

UNIT I DC AND AC CIRCUIT FUNDAMENTALS **9 Hours**

Definition of terms - voltage, current, power, energy, active and passive elements; Ohm's law and Kirchhoff's laws; Series and parallel circuits; source transformation; equivalent resistance; star/delta conversion; Concepts of AC circuits - RMS and average values, form and peak factors, real and reactive power, power factor.

UNIT II THREE PHASE SYSTEM **9 Hours**

Introduction to three phase circuits; balanced and unbalanced system; phase and line parameters - relations; power measurement -voltmeter and ammeter method, two and three watt meter methods; Components of AC transmission and distributions systems (single line diagram approach).

UNIT III ELECTRICAL MACHINES AND POWER PLANTS **9 Hours**

Operating principle, classification and applications of DC generator, DC motor, transformer and induction motor (single phase); Power plants - Thermal power plant, hydroelectric power plant and nuclear power plant (Block diagram approach only).

UNIT IV SEMICONDUCTOR DEVICES AND TRANSDUCERS **9 Hours**

Characteristics of PN junction diode and zener diode; Rectifiers- Half wave and full wave rectifiers (qualitative treatment only); BJT – configurations; Amplifiers & Oscillators - definition, classification and applications; Transducers – classification, resistance temperature detector (RTD), linear variable differential transformer (LVDT).

UNIT V DIGITAL ELECTRONICS AND COMMUNICATION SYSTEMS **9 Hours**

Boolean algebra - Reduction of Boolean expressions; De-Morgan's theorem; Logic gates - Implementation of Boolean expressions; Model of communication system - Analog and digital, Wired and wireless channel; Block diagram of various communication systems - Microwave, satellite, optical fiber and cellular mobile system.

TOTAL: 45 HOURS

FURTHER READING:

1. Working principle and operation of Fax and ISDN
2. LED lightings

COURSE OUTCOMES: Skill development

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

CO1: Remember the basic laws and fundamental concepts related to electrical, electronics and communication engineering
CO2: Apply basic concepts to solve problems in DC and AC circuits
CO3: Recall the principle of operation of DC & AC machines and power plants
CO4: Summarize the Boolean algebra and digital logic gates
CO5: Elucidate the characteristics of diode, BJT and applications of amplifiers and oscillators
CO6: Explain the operation of functional blocks of various communication systems

REFERENCES:

1. Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", 2nd Edition, PHI Learning, 2010.
2. R.Muthusubramaniam, S.Salaivahanan and K.A.Mureleedharan, "Basic Electrical Electronics and Computer Engineering", Tata McGraw Hill, 2004.
3. D.P.Kothari and I.J.Nagrath, "Theory and Problems of Basic Electrical Engineering", PHI learning, New Delhi, 2004.
4. J.B.Gupta, "Fundamentals of Electrical Engineering and Electronics", S.K.Kataria and Sons, Reprint 2012 Edition.
5. R.L.Boylestad and L.Nashelsky, "Electronic Devices and Circuit Theory", Pearson, 11th Edition, 2013.

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6. George Kennedy and Bernard Davis, "Kennedy's Electronic communication Systems", McGraw Hill Education, 5th Edition, 2011.
7. Donald P.Leach, Albert Paul Malvino and GoutamSaha, "Digital Principles and Applications", McGraw-Hill Education, 8th Edition, 2014.
8. http://nptel.ac.in/

1701GEX02 **ENGINEERING GRAPHICS** (Common to all B.E. / B.Tech Degree Programmes)

L	T	P	C
2	2	0	3

COURSE OBJECTIVES:

1. To develop in students, graphic skills for communication of concepts, ideas and design of Engineering products.
2. To expose them to existing national standards related to technical drawings.

CONCEPTS AND CONVENTIONS (Not for Examination) **2 Hours**

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES AND FREE HAND SKETCHING **10 Hours**

Basic Geometrical constructions, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves, Scales: Construction of Diagonal and Vernier scales.

Visualization concepts and Free Hand sketching: Visualization principles –Representation of Three Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of Objects

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES **10 Hours**

Orthographic projection- principles-Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS **10 Hours**

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES **10 Hours**

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes.

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS **10 Hours**

Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method.

COMPUTER AIDED DRAFTING (Demonstration Only) **8 Hours**

Basics commands of AutoCAD- two dimensional drawing, editing, layering and dimensioning - coordinate Systems-Drawing practice - orthographic views of simple solids using AutoCAD.

FURTHER READING:

Applications of engineering graphics in students' discipline

TOTAL: 60 HOURS

COURSE OUTCOMES: Skill Development

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

CO1: Perform free hand sketching of basic geometrical constructions and multiple views of objects.
CO2: Do orthographic projection of lines and plane surfaces.
CO3: Draw projections and solids and development of surfaces.
CO4: Prepare isometric and perspective sections of simple solids.
CO5: Demonstrate computer aided drafting.

REFERENCES:

1. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Stores, Bangalore,2007.
2. Luzzader, Warren.J. and Duff,John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.

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3. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson, 2nd Edition, 2009.
4. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.
5. Natrajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009.
6. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
7. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 50th Edition, 2010.

PUBLICATION OF BUREAU OF INDIAN STANDARDS:

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawing sheets.
2. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

SPECIAL POINTS APPLICABLE TO UNIVERSITY EXAMINATIONS ON ENGINEERING GRAPHICS:

1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.

1701GEX03	PROGRAMMING IN C (Common to all B.E. / B.Tech Degree Programmes)	L 3	T 0	P 0	C 3

COURSE OBJECTIVES:

1. To prepare students to comprehend the fundamental concepts
2. To demonstrate fine grained operations in number system
3. To gain exposure in programming language using C
4. To develop programming skills using the fundamentals and basics of C Language

UNIT I BASIC CONCEPTS **8 Hours**

Organization and Classifications of Computer- Generations of Computers- Number System- Problem Solving Techniques – Algorithm Design– Flowchart–Pseudocode

UNIT II INTRODUCTION TO C LANGUAGE **10 Hours**

Overview of C - Constants, Variables and Data Types- Compilation and Linking - Operators and Expressions- Decision Making and Branching – Looping statements

UNIT III ARRAYS AND STRINGS **9 Hours**

Arrays-One Dimensional Array- Declaration and Initialization-Two Dimensional Array-Declaration and Initialization- Programs using Arrays- Strings- String Handling Functions, Programs using Strings- Managing I/O Operations

UNIT IV FUNCTIONS & STRUCTURES **10 Hours**

Functions-Function Prototypes-Declaring, Defining and Calling Functions-Call by value and Call by Reference-Recursive Functions-Structures- Declaration and Definition -Accessing Structure Members-Arrays of Structures-Unions- Programs using Structures and Unions

UNIT V POINTERS & FILES **8 Hours**

Pointers-Dynamic Memory Allocation-Arithmetic Operations using Pointers, Files – File Manipulation-I/O Operations, Preprocessor Directives, Storage Classes

TOTAL: 45 HOURS

FURTHER READING:

Object Oriented Programming Approach.

COURSE OUTCOMES: Employability

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

CO1: Describe basic concepts of computers
CO2: Paraphrase the operations of number system
CO3: Describe about basic concepts of C-Language
CO4: Understand the code reusability with the help of user defined functions
CO5: Analyze the structure concept, union, file management and preprocessor in C language

REFERENCES:

1. E. Balagurusamy,"Programming in ANSI C", McGraw Hill Education India Private Limited; Seventh Edition, 2017.

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2. Pradip Dey, Manas Ghosh , "Computer Fundamentals and Programming in C", Second Edition, Oxford University Press, 2013.
3. Ashok N. Kamthane, "Programming in C", Pearson Education India, 3rd Edition, 2015.
4. Yashavant P. Kanetkar, "Let Us C", BPB Publications, 15th Revised and Updated Edition, 2016.
5. http://nptel.ac.in/

1701HS151	PHYSICS AND CHEMISTRY LABORATORY-I (Common to all B.E. / B.Tech Degree Programmes)	L 0	T 0	P 2	C 1

COURSE OBJECTIVES:

1. The Objective of this course is to make the students gain practical knowledge to co-relate with the theoretical studies
2. To achieve perfectness in experimental skills
3. To bring confidence and ability to develop and fabricate engineering and technical equipments.
4. To train the students to analyses the water sample
5. To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis

PHYSICS

LIST OF EXPERIMENTS:

1. Determine the moment of inertia of the disc and calculate the rigidity modulus of a given wire using torsion pendulum (symmetrical masses method).
2. Find the elevation of the given wooden beam at the midpoint by loading at the ends and hence calculate the Young's modulus of the material by uniform bending.
3. Determine the coefficient of viscosity of the given liquid by Poiseulle's method.
4. From the interference fringes from the air wedge setup and calculate the thickness of the given wire.
5. By applying the principle of diffraction, determine the wavelength of given laser light and the average particle size of lycopodium powder using laser source.
6. Determine the
   (i) Wavelength of ultrasonic in a liquid medium
   (ii) Velocity of ultrasonic waves in the given liquid
   (iii) Compressibility of the given liquid using ultrasonic interferometer.

CHEMISTRY

LIST OF EXPERIMENTS:

1. Determination of total, temporary & permanent hardness of water by EDTA method
2. Determination of strength of given hydrochloric acid using pH meter
3. Estimation of iron content of the given solution using potentiometer
4. Estimation of sodium present in water using flame photometer
5. Corrosion experiment – weight loss method
6. Determination of molecular weight of a polymer by viscometry method
7. Conductometric titration of strong acid Vs strong Base

TOTAL: 45 HOURS

COURSE OUTCOMES:

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

CO1: Realize the concept of properties of matter and apply the same for practical applications.
CO2: Identify the suitable laser source for fiber optic communication applications. Employability
CO3: Determine the velocity of ultrasonic waves and apply the same for day today applications.
CO4: Classify the different types of crystal structures and analyze their properties.
CO5: Comprehend the efficacy of quantum equations in modern areas.
CO6: Identify the pH of the solution.
CO7: Find the iron content of the water sample using potentiometer. Skill Development
CO8: Explain and demonstrate the conductance of the solution.
CO9: Interpret the hardness and metal ions present in the water.

REFERENCES:

1. D.S.Mathur, Elements of Properties of matter, 5th edition, S.Chand & Company Ltd., New Delhi,2012.
2. Charles Kittel, Introduction to Solid State Physics, 8th edition, Wiley India Pvt. Ltd., New Delhi, 2012.
3. Arthur Beiser, Shobhit Mahajan and S. Rai Choudhury, Concepts of Modern Physics, 6th edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2010.
4. B.K. Pandey and S. Chaturvedi, Engineering Physics, 1st edition, Cengage Learning India Pvt. Ltd., New Delhi, 2012.
5. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc, 2011.

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6. Ian Morison, Introduction to Astronomy and Cosmology, John Wiley and Sons, Ltd, 2013.
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1701GEX51	PROGRAMMING IN C LABORATARY (Common to all B.E. / B.Tech. Degree Programmes)	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

1. To prepare students to comprehend the fundamental concepts
2. To demonstrate fine grained operations in number system
3. To gain exposure in programming language using C
4. To develop programming skills using the fundamentals and basics of C Language.

LIST OF EXPERIMENTS:

1. Working with word and style sheets
2. Write a C program to implement basic concepts
3. Write a C program to implement Decision Making and Branching statements
4. Write a C program to implement looping statements
5. Write a C program to implement Arrays
6. Write a C program to implement Strings
7. Write a C program to implement pointers
8. Write a C program to implement Structures
9. Write a C program to work with files in C

TOTAL: 30 HOURS

ADDITIONAL EXPERIMENTS:

1. Write a c program to remove the occurrence of "the" word from entered string.
2. Create two files test1.txt and test2.txt and write a C program to read the file text1.txt character by character on the screen and paste it at the end of test2.txt

COURSE OUTCOMES:

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

CO1: Understand basic concepts of computers — Skill Development
CO2: Implement basic concepts of c-language
CO3: Implement arrays, strings and pointers. — Employability
CO4: Implement the basics of structures, unions, file management and preprocessor in C language

REFERENCES:

1. E. Balagurusamy,"Programming in ANSI C", McGraw Hill Education India Private Limited; Seventh Edition, 2017.
2. Pradip Dey, Manas Ghosh , "Computer Fundamentals and Programming in C", Second Edition, Oxford University Press, 2013.
3. Ashok N. Kamthane, "Programming in C", Pearson Education India, 3rd Edition, 2015.
4. Yashavant P. Kanetkar, "Let Us C", BPB Publications, 15th Revised and Updated Edition, 2016.
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1701GEX52	COMMUNICATION SKILLS LAB (Common to all B.E. / B.Tech Degree Programmes)	L 0	T 0	P 2	C 1

COURSE OBJECTIVES:

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

1. To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts
2. Further, they would be required to communicate their ideas relevantly and coherently in writing.
3. To prepare all the students for their placements.

LIST OF EXPERIMENTS: The following course content to conduct the activities is prescribed for the Communication Skills Lab:

1. **Activities on Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation - responding appropriately and relevantly - using the right body language - Role Play in different situations & Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.
2. **Activities on Reading Comprehension** - General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.
3. **Activities on Writing Skills** - Structure and presentation of different types of writing - letter writing/ Resume writing/ e-correspondence/ Technical report writing/ Portfolio writing - planning for writing - improving one's writing.
4. **Activities on Presentation Skills** - Oral presentations (individual and group) through JAM sessions / seminars / PPTs and written presentations through posters/ projects/ reports/ e-mails/ assignments etc.
5. **Activities on Group Discussion and Interview Skills** - Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video-conferencing and Mock Interviews.

TOTAL: 30 HOURS

ADDITIONAL EXPERIMENTS:

Phonetics

COURSE OUTCOMES: Skill Development

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

CO1: Accomplishment of sound vocabulary and its proper use contextually.
CO2: Flair in Writing and felicity in written expression
CO3: Enhanced job prospects.
CO4: Effective Speaking Abilities.

REFERENCES:

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009
2. Advanced Communication Skills Laboratory Manual by Sudha Rani, D, Pearson Education 2011.
3. Technical Communication by Paul V. Anderson, 2007. Cengage Learning pvt. Ltd. New Delhi
4. English Vocabulary in Use series, Cambridge University Press 2008.
5. Management Shapers Series by Universities Press (India) Pvt Ltd., Himayatnagar, Hyderabad 2008.
6. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw Hill 2009.
7. Books on TOFEL/ GRE/ GMAT/ CAT/ IELTS by Barron's/ DELTA/ Cambridge University Press.

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1701MA201	ENGINEERING MATHEMATICS II (Common to all B.E / B.Tech Degree Programmes)	L 3	T 2	P 0	C 4

COURSE OBJECTIVES:

1. To develop an understanding of the standard techniques of Complex variable theory to apply in areas such as heat conduction, elasticity, fluid Dynamics and flow of electric current
2. To train the students with the concepts of Vector calculus needed for problems in all Engineering Disciplines
3. To make the Students apply Laplace Transform to create a new domain in which it is easier to handle the problem that is being investigated

UNIT I ANALYTIC FUNCTIONS **9 Hours**

Analytic functions – Cauchy Riemann Equations – Properties – Determination of Analytic function using Milne Thomson's method, Conformal Mappings – Mappings of w= z + a, az, 1/z – Bilinear Transformation – Application of Analytic Functions.

UNIT II COMPLEX INTEGRATION **9 Hours**

Cauchy's fundamental theorem (statement only) – Application of Cauchy's Integral formula – Laurent's series – Classification of singularities – Cauchy's Residue theorem (statement only) – Contour integration.

UNIT III MULTIPLE INTEGRAL **9 Hours**

Double integration – Cartesian and polar coordinates – Change the order of Integration – Applications: Area of a curved surface using double integral – Triple integration in Cartesian co-ordinates – Volume as triple integral.

UNIT IV VECTOR CALCULUS **9 Hours**

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) – Applications of the above theorems to find surface area of a closed region and volume of cube and parallel piped.

UNIT V LAPLACE TRANSFORM **9 Hours**

Laplace Transform – Conditions for existence – Transform of Elementary Functions – Basic Properties – Transform of Unit step function and Impulse function – Transform of Periodic function – Inverse Laplace Transform – Convolution Theorem (excluding Proof) – Initial and Final value Theorems – Solution of Linear ODE of Second order with constant coefficient using Laplace Transform techniques.

TOTAL: 45 + 15 HOURS

FURTHER READING:

1. Volume of Cylindrical and spherical polar co ordinates.
2. Application of Integral theorems in finding Volume/Area of Hemispheres, cylinders etc.

COURSE OUTCOMES: Skill Development

On the Successful completion of the course, Students will be able to

CO1: Construct Analytic functions and trace the image of a region using transformation.
CO2: Solve complex integrals.
CO3: Apply multiple integral technique to find area and volume.
CO4: Compute surface and volume integral in vector field.
CO5: Apply Laplace Transform in solving Boundary value problems of second order ODE.

REFERENCES:

1. Veerarajan R., "Engineering Mathematics", updated second edition for Semester I and II, 2017.
2. Grewal. B.S, "Higher Engineering Mathematics", 44th Edition, Khanna Publications, Delhi, 2014.
3. Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", Sixth edition, Laxmi Publications Pvt. Ltd., 2014.
4. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, 2012.
5. P.Kandasamy, K. Gunavathy and K. Thilagavathy, Engineering Mathematics, Volume II, S. Chand & Co., New Delhi, 2009.
6. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing, New Delhi, 2007.
7. Veerarajan R., "Engineering Mathematics", fifth Edition, Tata Mc Graw Hill Publishing Company, New Delhi, 2006.
8. M K Venkataraman, Engineering mathematics, Volume I, 2nd ed., National Publishing Co., 2003.
9. nptel.ac.in/courses/111105035, www.nptelvideos.in/2012/11/Mathematics.html
10. www.learnerstv.com/Free-maths-video lectures - ltv348-page1.htm

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1701PH201	PHYSICS OF ENGINEERING MATERIALS (Common to B.E. CSE & B.Tech. IT Programmes)	L 3	T 0	P 0	C 3

COURSE OBJECTIVES:

1. To understand the physical properties of conductors, semiconductors and superconductors.
2. To recognize the basic principle of interaction of light with matter and working of optical devices.
3. To classify the types of dielectric, magnetic materials and polarization mechanisms with their properties.

UNIT I CONDUCTING AND SUPERCONDUCTING MATERIALS **9 Hours**

Electrical and thermal conductivity of metals – Wiedemann Franz law – band theory of metals – density of states. Superconductors: properties – types – High Tc superconductors – applications.

UNIT II SEMICONDUCTORS **9 Hours**

Elemental and compound semiconductors – intrinsic semiconductors: carrier concentration – electrical conductivity – band gap. Extrinsic semiconductors: carrier concentration – variation of Fermi level. Hall effect: theory and experimental determination – applications: Solar cells.

UNIT III DIELECTRIC MATERIALS **9 Hours**

Types of polarization: electronic, ionic, orientation and space charge polarization mechanisms – langevin – Debye equation – frequency and temperature effects on polarization – dielectric strength and loss – dielectric breakdown mechanisms – active dielectric materials: pizo, pyro and ferroelectricity – applications.

UNIT IV OPTICAL MATERIALS **9 Hours**

Interaction of light with materials – optical absorption – transmission – Luminescence in solids – Fluorescence and Phosphorescence – Optical band gap – LED, LCD.

UNIT V MAGNETIC MATERIALS **9 Hours**

Classification and properties – domain theory – hard and soft magnetic materials – anti-ferro and ferri magnetic materials – applications: magnetic recording and memories.

TOTAL: 45 HOURS

FURTHER READING:

1. Photonic crystals - LIFI

COURSE OUTCOMES: Skill Development

On the Successful completion of the course, Students will be able to

CO1: Exemplify the physical properties of conductors, superconductors and semiconductors with applications.

CO2: Identify the suitable semiconducting material for solar cell applications.

CO3: Select the suitable materials for insulating and dielectric applications.

CO4: Compare the optical properties of display devices.

CO5: Analyze the properties of magnetic materials for practical applications.

REFERENCES:

1. Saxena, Gupta, Mandal, Solid State Physics, Pragati Prakashan Educational Publishers, 13th revised edition, Meerut, India, 2013.
2. M.N. Avadhanulu and P.G.Kshirsagar, A Text Book of Engineering Physics, S.Chand & Company Ltd, New Delhi, 2011.
3. S.O.Pillai, Solid State Physics, New Age International Publications, New Delhi, 2010.
4. M.A. Wahab, N.K. Mehta, Solid State physics – structure and properties of materials, Narosa publishing house Pvt. Ltd, 6th edition, 2010.
5. Semiconductor Physics and Devices, Donald A. Neamen, Mc Graw-Hill, 2011.
6. P.K. Palanisamy, Materials Science, Scitech Publications India Pvt.Ltd, 2014.

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1701CH201	ENVIRONMENTAL STUDIES (Common to all B.E. / B.Tech Degree Programmes)	L 3	T 0	P 0	C 3

COURSE OBJECTIVES:

1. Realize the interdisciplinary and holistic nature of the environment.
2. Understand how natural resources and environment affect the quality of life and stimulate the quest for sustainable development.
3. Recognize the socio-economic, political and ethical issues in environmental science.

UNIT I ECOSYSTEMS AND BIODIVERSITY **10 Hours**

Concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – Oxygen cycle and Nitrogen cycle – energy flow in the ecosystem – ecological succession processes – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – hot – spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man – wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Documentation of the medicinal plants in your native place.

UNIT II NATURAL RESOURCES **10 Hours**

Forest resources: Use and over – exploitation, deforestation, case studies – timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and overutilization of surface and ground water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources. Energy Conversion processes – Biogas – production and uses, anaerobic digestion; case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles. Documentation of the effect of modern Agriculture in your nearby Village.

UNIT III ENVIRONMENTAL POLLUTION **9 Hours**

Definition – Source, causes, effects and control measures of: (a) Air pollution – Mitigation procedures – Control of particulate and gaseous emission, Control of SO_X, NO_x, CO and HC) – Technology for capturing CO_2 (metallo- organic frame works) (b) Water pollution – Waste water treatment processes. (c) Soil pollution – soil waste management: causes, effects and control measures of municipal solid wastes – (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – role of an individual in prevention of pollution – pollution case studies. Documentation study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT **8 Hours**

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – environmental ethics: Issues and possible solutions – 12 Principles of green chemistry – consumerism and waste products – environment protection act – Air act – Water act – Wildlife protection act – Forest conservation act – The Biomedical Waste (Management and Handling) Rules; 1998 and amendments – scheme of labeling of environmentally friendly products (Ecomark) central and state pollution control boards – disaster management: floods, earthquake – Public awareness. Analyze the recent steps taken by government of India to prevent pollution (Green India and Clean India).

UNIT V HUMAN POPULATION AND THE ENVIRONMENT **8 Hours**

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – Environmental impact analysis (EIA) – GIS – remote sensing – role of information technology in environment and human health – Case studies. Documentation study of the Human health and the environment in nearby Hospital (Statistical report).

TOTAL: 45 HOURS

FURTHER READING:

Human rights: E – waste and biomedical waste – Identification of adulterants in food materials

COURSE OUTCOMES: Employability

On the Successful completion of the course, Students will be able to

CO1: Describe the importance of ecosystem and its conservation.
CO2: Differentiate various natural resources and the urgent need to conserve the natural resources.
CO3: Explain the different types of pollution and its effects.
CO4: Describe the various environmental protection acts.
CO5: Explain the major diseases, women, child development and the impacts of population explosion.

REFERENCES:

1. Trivedi. R.K., "Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards", Vol. I and II, Enviro Media, 3rd edition, BPB publications, 2010.
2. Cunningham, W.P.Cooper, T.H. Gorhani, "Environmental Encyclopedia", Jaico Publishing House, Mumbai, 2001.
3. Dharmendra S. Sengar, "Environmental law", Prentice hall of India PVT LTD, New Delhi, 2007.
4. Rajagopalan. R, "Environmental Studies-From Crisis to Cure", Oxford University Press, 2005.
5. Benny Joseph, "Environmental Science and Engineering", Tata McGraw-Hill, New Delhi, 2006.
6. https://en.wikipedia.org/wiki/Carbon_capture_and_storage
7. Ravikrishnan. A., "Environmental Science and Engineering", Sri Krishna Hi-tech Publishing Company Pvt. Ltd.

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1701GE201	BASIC CIVIL AND MECHANICAL ENGINEERING (Common to B.E. / B.Tech. – CSE, ECE & IT)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. To impart basic knowledge on Civil and Mechanical Engineering.
2. To explain the materials used for the construction of civilized structures.
3. To understand the fundamentals of construction of structure.
4. To explain the component of power plant units and detailed explanation to IC engines their working principles.
5. To explain the R & AC system.

A – CIVIL ENGINEERING

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS **9 Hours**

Surveying: Objects – types – classification – principles.

Civil Engineering Materials: Bricks – stones – sand – cement – concrete – steel sections

UNIT II BUILDING COMPONENTS AND STRUCTURES **9 Hours**

Foundations: Types, Bearing capacity – Requirement of good foundations.

Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring –plastering – Mechanics – Internal and external forces – stress – strain – elasticity.

B – MECHANICAL ENGINEERING

UNIT III POWER PLANT ENGINEERING AND PUMPS **9 Hours**

Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydro-electric and Nuclear Power plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump.

UNIT IV IC ENGINES **9 Hours**

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as a power plant.

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM **9 Hours**

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner.

TOTAL: 45 HOURS

FURTHER READING:

1. Mechanics of solids.
2. Structural Design.
3. Thermal Engineering, Fluid mechanics, Heat and mass transfer.

COURSE OUTCOMES: Employability

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

CO1: Explain the survey and usage of construction material and proper selection of construction materials.

CO2: Know about the building structures.

CO3: Identify the components of power plant.

CO4: Demonstrate working principles of petrol and diesel engine.

CO5: Explain the components of refrigeration and air conditioning.

REFERENCES:

1. Ramamrutham S., "Basic Civil Engineering", Dhanpat Rai Publishing Co. (P) Ltd., New Delhi, 1999.
2. Seetharaman S., "Basic Civil Engineering", Anuradha Agencies, 2005.
3. Venugopal K. and Prahu Raja V., "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam, 2000.
4. Shantha Kumar S R J., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, 2000.
5. ,Shanmugam G and Palanichamy M S, "Basic Civil and Mechanical Engineering", Tata McGraw Hill Publishing Co., New Delhi, 1996.

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1702CS201 **PROGRAMMING IN C++** **L T P C**

(Common to B.E. CSE & B.Tech. IT Programmes) **3 0 0 3**

COURSE OBJECTIVES:

1. To understand the concepts of Object Oriented Programming.
2. To execute the Object oriented concepts to solve problems using C++
3. To develop programs using files and templates.

UNIT I BASIC CONCEPTS **8 Hours**

Object Oriented Paradigm – Elements of Object Oriented Programming – Merits and Demerits of Object oriented Methodology – C++ fundamentals – Data types, Operators and Expressions, Control flow, Arrays – Implementing ADT in the base language.

UNIT II CLASS AND OBJECTS **10 Hours**

Classes and Objects – Passing objects as arguments – returning objects – Friend functions – Static data and member functions – Constructors – Parameterized Constructor – Destructor – Copy constructor – Array of objects – pointer to object members.

UNIT III POLYMORPHISM AND INHERITANCE **9 Hours**

Polymorphism – Function overloading – Unary operator overloading – Binary operator overloading – Data conversion – Overloading with Friend Functions. Inheritance – Derived Class – Abstract Classes – Types of Inheritance – Iterators and Containers.

UNIT IV VIRTUAL FUNCTIONS AND TEMPLATES **10 Hours**

Virtual functions – Pure virtual functions – Virtual Destructors – RTTI – Typeid – Dynamic casting – Cross casting – Down casting – Template – Class template, Function Template, Generic programming, Standard Template Library.

UNIT V FILES AND EXCEPTION HANDLING **8 Hours**

C++ streams – console streams – console stream classes – formatted and unformatted console I/O operations – Manipulators File streams classes – File modes – File pointers and Manipulations – File I/O – Exception Handling – Try-Catch-Throw Paradigm – Exception specifications – Terminate and unexpected functions – Uncaught Exception.

TOTAL: 45 HOURS

FURTHER READING:

Object Oriented Approach in Java Programming

COURSE OUTCOMES: Employability -

On the Successful completion of the course, Students will be able to

CO1: Explore the concept of classes and objects.
CO2: Develop programs using arrays and strings.
CO3: Implement the various types of inheritance.
CO4: Exemplify the concepts of functions and streams.
CO5: Develop programs using files, templates and exception handling.

REFERENCES:

1. K.R.Venugopal, Rajkumar Buyya, and T.Ravishankar, "Mastering C++", MaGraw Hill Education, 2nd Edition, 2017.
2. Bjarne Stroustrup, "The C++ programming language", Addison Wesley, fourth edition, 2013
3. E.Balagurusamy, "Object Oriented Programming with C++", MaGraw Hill Education, 5th Edition, 2017.
4. Robert Lafore, "Object Oriented Programming in C++", Galgotia Publications Pvt. Ltd., Third Edition, 1999.
5. Ira Pohl, "Object oriented programming using C++", 2nd Edition, Pearson Education, Reprint 2004.
6. http://nptel.ac.in/

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1701GEX53

WORKSHOP PRACTICE

(Common to all B.E. / B.Tech Degree Programmes)

L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

1. To provide hands on training for fabrication of components using sheet metal and welding equipment / tools.
2. To develop skill for using carpentry and fitting tools to make simple components and metal joints.
3. To provide hands on training for preparing the green sand mould using foundry tools.
4. To provide training for making simple house hold electrical & pipe line connections using suitable tools.
5. To develop the skill to make / operate/utilize the simple engineering components.

LIST OF EXPERIMENTS

1. Forming of simple object in sheet metal using suitable tools (Example: Dust Pan / Soap Box) (or) making simple object using Metal Spinning Machine. (Example: Aluminum Cup). — **4 Hours**
2. Prepare V (or) Half round (or) Square (or) Dovetail joint from the given mild Steel flat. — **4 Hours**
3. Fabrication of a simple component using thin and thick plates. (Example: Book rack) — **2 Hours**
4. Making a simple component using carpentry power tools. (Example: Electrical switch Box/Tool box/ Letter box. — **2 Hours**
5. Construct a household pipe line connections using pipes, Tee joint, Four way joint, elbow, union, bend, Gate way and Taps (or) Construct a pipe connections of house application centrifugal pump using pipes, bend, gate valve, flanges and foot valve. — **4 Hours**
6. Prepare a green sand mould using solid pattern/split pattern. — **4 Hours**
7. Study of gas welding equipment and its demonstration — **2 Hours**
8. Soldering Practice for simple printed circuit board. — **4 Hours**
9. Construct a domestic electrical wire connections using indicator, one way switch with calling bell, two way switch with lamp, one way switch with fan regulator and one way switch with socket. — **4 Hours**

TOTAL: 30 HOURS

COURSE OUTCOMES:

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

CO1: Fabricate simple components using sheet metal & welding equipment/tools.
CO2: Make simple components / joints using carpentry and fitting tools.
CO3: Prepare green sand mould using suitable tools.
CO4: Make simple house hold electrical & pipe line connections using suitable tools.
CO5: Make / operate / utilize the simple engineering components.

Skill Development
Employability
Entrepreneur

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1701HS251 **PHYSICS AND CHEMISTRY LABORATORY-II** (Common to all B.E. / B.Tech Degree Programmes)

L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

1. The Objective of this course is to make the students gain practical knowledge to co-relate with the theoretical studies.
2. To achieve perfectness in experimental skills.
3. To bring confidence and ability to develop and fabricate engineering and technical equipments.
4. To make the student acquire practical skills in the wet chemical and instrumental methods for quantitative estimation of hardness, alkalinity, metal ion content, corrosion in metals and cement analysis.

LIST OF EXPERIMENTS: **PHYSICS**

1. Using lees disc apparatus, determine the coefficient of thermal conductivity of a bad conductor.
2. Find the band gap value of the given semiconductor diode. Based on the band gap value, identify the given semiconductor.
3. With the aid of spectrometer, find the angle of Prism and refractive index of the medium.
4. Determine the wavelengths of polychromatic source in the visible region using spectrometer grating.
5. Find the depression at the midpoint of the given wooden beam subjected to non-uniform bending and determines the Young's modulus of the material of the beam.
6. Find the given unknown resistance using Carey-Foster's Bridge.

LIST OF EXPERIMENTS: **CHEMISTRY**

1. Conductometric Precipitation titration of $BaCl_2$ Vs Na_2SO_4
2. Estimation of dissolved oxygen in a water sample/sewage by Winklers method.
3. Estimation of chloride content in water by argentometric method.
4. Conductometric titration of mixture of acids.
5. Comparison of alkalinities of the given water samples.

Additional Experiments:

1. Estimation of heavy metals in the given solution by EDTA method.
2. Determination of concentration of unknown colored solution using spectrophotometer.

COURSE OUTCOMES: **TOTAL: 30 HOURS**

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

CO1 : Realize the concept of properties of matter and apply the same for practical applications.
CO2 : Identify the suitable laser source for fiber optic communication applications.
CO3 : Determine the velocity of ultrasonic waves and apply the same for day today applications.
CO4 : Classify the different types of crystal structures and analyze their properties. Employability
CO5 : Comprehend the efficacy of quantum equations in modern areas.
CO6 : Illustrate the EMF of the Redox reaction.
CO7 : Compare the Alkalinity of given water Sample with their standards.
CO8 : Identify the Concentration of metal ion present in water sample.
CO9 : Outline the precipitation titration using Conductivity meter.
CO10: Interpret the dissolved oxygen present in the water. Skill Development

REFERENCES:

1. D.S.Mathur, Elements of Properties of matter, 5th edition, S.Chand & Company Ltd., New Delhi,2012.
2. Charles Kittel, Introduction to Solid State Physics, 8th edition, Wiley India Pvt. Ltd., New Delhi, 2012.
3. Arthur Beiser, Shobhit Mahajan and S. Rai Choudhury, Concepts of Modern Physics, 6th edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2010.
4. B.K. Pandey and S. Chaturvedi, Engineering Physics, 1st edition, Cengage Learning India Pvt. Ltd., New Delhi, 2012.
5. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc, 2011.
6. Ian Morison, Introduction to Astronomy and Cosmology, John Wiley and Sons, Ltd, 2013.
7. Laboratory Manual on Engineering Chemistry, S.K. Bhasin, S. Rani, Dhanpat Rai Publishing Company, New Delhi, 2011.
8. Daniel R. Palleros, "Experimental organic chemistry" John Wiley & Sons, New York (2001).
9. Furniss B.S. Hannaford A.J, Smith P.W.G and Tatchel A.R., "Vogel's Textbook of practical organic chemistry", LBS Singapore (1994).
10. Jeffery G.H., Bassett J., Mendham J.and Denny vogel's Textbook of quantitative analysis chemical analysis", ELBS 5th Edn. Longman, Singapore publishers, Singapore, 1996.
11. Kolthoff I.M., Sandell E.B. et al. "Quantitative chemical analysis", Macmillan, Madras 1980.

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1702CS251	PROGRAMMING IN C++ LAB (Common to B.E. CSE & B.Tech. IT Programmes)	L 0	T 0	P 2	C 1

COURSE OBJECTIVES:

1. To understand the concepts of Object Oriented Programming.
2. To execute the Object oriented concepts to solve problems using C++
3. To develop programs using files and templates.

LIST OF EXPERIMENTS:

1. Write a C++ program to implement operator overloading with class and objects.
2. Write a C++ program to implement types of Inheritance.
3. Write a C++ program to implement two different classes for adding a private data member using friend function.
4. Write a C++ program to implement operator and function overloading.
5. Write a C++ program to implement file handling operations.
6. Write a C++ program to implement Class templates and Function templates.
7. Write a C++ program to implement exception handling.

Additional Experiments:

1. Write a C ++ program to perform complex number subtraction by overloading an operator using friend function.
2. Write a C ++ program to perform quick sort using function template.

TOTAL: 30 HOURS

COURSE OUTCOMES:

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

CO1 : Implement the concept of classes and objects.
CO2 : Develop programs using arrays and strings. Employability
CO3 : Implement the various types of inheritance.
CO4 : Exemplify the concepts of functions and streams. Skill Development

REFERENCES:

1. K.R.Venugopal, Rajkumar Buyya, and T.Ravishankar, "Mastering C++", MaGraw Hill Education, 2nd Edition, 2017.
2. Bjarne Stroustrup, "The C++ programming language", Addison Wesley, fourth edition, 2013
3. E.Balagurusamy, "Object Oriented Programming with C++", MaGraw Hill Education, 5th Edition, 2017.
4. Robert Lafore, "Object Oriented Programming in C++", Galgotia Publications Pvt. Ltd., Third Edition, 1999.
5. Ira Pohl, "Object oriented programming using C++", 2nd Edition, Pearson Education, Reprint 2004.
6. http://nptel.ac.in/

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III

1701MA301	ENGINEERING MATHEMATICS III (Common to B.E - Civil, CSE, EEE, Mech B.Tech- IT Degree Programmes)	L	T	P	C
		3	2	0	4

PREREQUISITE :

1. Engineering Mathematics I
2. Engineering Mathematics II

COURSE OBJECTIVES:

1. To introduce Fourier series analysis and applications in Engineering, apart from its use in solving boundary value problems.
2. To acquaint the student with Fourier transform techniques used in wide variety of situations.
3. To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems.

UNIT I FOURIER SERIES **12 Hours**

Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Parseval's identity – Harmonic analysis – Simple Applications

UNIT II FOURIER TRANSFORMS **12 Hours**

Statement of Fourier integral theorem – Fourier transform pair – Fourier sine and cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity

UNIT III PARTIAL DIFFERENTIAL EQUATIONS **12 Hours**

Formation of partial differential equations – Singular integrals — Solutions of standard types of first order partial differential equations – Lagrange's linear equation — Linear partial differential equations of second order with constant coefficients of homogeneous type- Applications

UNIT IV APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS **12 Hours**

Classification of PDE – Solutions of one dimensional wave equation – One dimensional equation of heat conduction – Steady state solution of two dimensional equation of heat conduction.

UNIT V Z – TRANSFORMS AND DIFFERENCE EQUATIONS **12 Hours**

Z - transforms – Elementary properties – Inverse Z – transform (using partial fraction and residues) – Convolution theorem – Formation of difference equations – Solution of difference equations using Z – transform.

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

1. Linear Algebra
2. Numerical Solution of non-homogeneous partial differential equations

COURSE OUTCOMES:

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

CO1 Use Fourier series analysis which is central to many applications in engineering
CO2 Apply Fourier transform techniques used in wide variety of situations
CO3 Compute the solution of partial differential equations
CO4 Solve boundary value problem using partial differential equation
CO5 Apply Z transform techniques for discrete time systems

Skill Development

REFERENCES:

1. Veerarajan. T., "Transforms and Partial Differential Equations", Second reprint, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2012
2. Grewal. B.S., "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, Delhi, 2012.
3. Bali.N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 7th Edition, Laxmi Publications Pvt Ltd , 2007
4. Ramana.B.V., "Higher Engineering Mathematics", Tata Mc-GrawHill Publishing Company Limited, New Delhi, 2008.
5. Narayanan.S., Manicavachagom Pillay.T.K and Ramanaiah.G "Advanced Mathematics for Engineering Students" Vol. II & III, S.Viswanathan Publishers Pvt Ltd. 1998.
6. www.nptelvideos.in/2012/11/mathematics-iii.html

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1702IT301	DATA STRUCTURES AND ALGORITHMS	L	T	P	C
		3	0	2	4

PREREQUISITE :

Programming in C and C++

COURSE OBJECTIVES:

1. Learn the fundamental concepts of Data Structures
2. Study the various algorithms and analysis methods
3. Use various data structures and algorithms techniques for real time examples

UNIT I INTRODUCTION **9 Hours**

Data Structures – Programming Strategies – ADT – Algorithms – Problem Solving – Complexity – Asymptotic Notations – Recurrence Relations

UNIT II DATA STRUCTURES **9 Hours**

Array – List: Types, Applications, Linked List – Stack: Operations, Applications, Implementations – Queue: Operations, Applications, Implementations – Tree: Types, Implementation, Applications

UNIT III DIVIDE AND CONQUER & DYNAMIC PROGRAMMING **9 Hours**

Divide and Conquer techniques with Algorithm Analysis – Merge Sort – Optimal Binary Search Tree, Huffman Tree – Strassen's Matrix Multiplications. Dynamic Programming with Algorithm Analysis – Graph – Warshall's, Floyd' Algorithms – Binomial Coefficient

UNIT IV GREEDY AND ITERATIVE METHODS **9 Hours**

Prim's Algorithm – Kruskal's Algorithms – Dijikstra's Algorithms – The stable Marriage Problem – Algorithm Analysis

UNIT V ALGORITHM ANALYSIS AND APPLICATIONS **9 Hours**

Algorithm Analysis and power – P,NP,NP-Complete Problems – Backtracking – N-Queen Problem, Graph Coloring – Branch and Bound –Decision Tree - Travelling Salesman Problem – Knapsack Problem

LIST OF EXPERIMENTS: **15 Hours**

MODULE 1:

1. Implement Array ADT
3. Write the program to perform Linked List, Stack and Queue Operations
4. Write the program to implement Tree Traversal operations
5. Write the program to implement sorting operations
6. Write the program to implement searching operations

MODULE 2:

1. Implement Tower of Honoi Problem using recursion
2. Implement Fibonacci number generation using recursion
3. Implement minimum spanning tree using Prim's, Kruskal's Algorithms
4. Write program to implement all the functions of a dictionary (ADT) using hashing.
5. Given the sequence of integers 5 9 1 7 4 3 2 0 manually arrange this sequence in ascending order using the three "'elementary"' sorting methods: insertion sort, bubble sort and selection sort, showing at each step the new configuration of the sequence. How many comparisons and how many element moves were used by each method? Which is the best performing method for sorting this array of integers? Which would be the worst arrangement of this sequence?

Hardware: Standalone desktops 30 Nos

Software: Turbo C++ compiler or equivalent

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

1. Decision Tree Approach
2. Networking problems

COURSE OUTCOMES: Employability

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

CO1 Understand the concepts of Data structures and Algorithms
CO2 Explain various data structures
CO3 Apply Divide and Conquer & Dynamic programming method to solve different problems
CO4 Apply Greedy and Iterative method to solve different problems
CO5 Analysis various algorithms using various types and methods

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REFERENCES:

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education, 2014

1702IT302	DIGITAL PRINCIPLES AND DESIGN	L	T	P	C
		3	0	2	4

PREREQUISITE :

Basic Electrical and Electronics Engineering

COURSE OBJECTIVES:

Learn how to design digital circuits, by simplifying the Boolean functions. Also, gives an idea about designs using PLDs, and writing codes for designing larger digital systems.

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

Review of Number Systems – Arithmetic Operations – Binary Codes – Boolean Algebra and Theorems – Boolean Functions – Simplification of Boolean Functions using Karnaugh Map and Tabulation Methods – Logic Gates – NAND and NOR Implementations.

UNIT II COMBINATIONAL LOGIC **9 Hours**

Combinational Circuits – Analysis and Design Procedures – Circuits for Arithmetic Operations, Code Conversion – Decoders and Encoders – Multiplexers and Demultiplexers – Introduction to HDL – HDL Models of Combinational circuits.

UNIT III SYNCHRONOUS SEQUENTIAL LOGIC **9 Hours**

Sequential Circuits – Latches and Flip Flops – Analysis and Design Procedures – State Reduction and State Assignment – Shift Registers – Counters – HDL for Sequential Logic Circuits.

UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC **9 Hours**

Analysis and Design of Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards

UNIT V MEMORY AND PROGRAMMABLE LOGIC **9 Hours**

RAM and ROM – Memory Decoding – Error Detection and Correction – Programmable Logic Array – Programmable Array Logic – Sequential Programmable Devices – Application Specific Integrated Circuits.

LIST OF EXPERIMENTS: **15 Hours**

1. Verification of Boolean Theorems using basic gates.
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters.
3. Design and implementation of combinational circuits using MSI devices: 4 – bit binary adder / subtractor Parity generator / checker Magnitude Comparator Application using multiplexers
4. Design and implementation of sequential circuits: Shift –registers - Synchronous and asynchronous counters
5. Coding combinational / sequential circuits using HDL.
6. Design and implementation of a simple digital system

Hardware: 1. Digital trainer kits 30

2. Digital ICs required for the experiments in sufficient numbers

Software: HDL simulator

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

1. Decision Tree Approach
2. Networking problems

COURSE OUTCOMES: Skill Development

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

CO1 Understand different methods used for the simplification of Boolean functions
CO2 Explain the fundamentals of VHDL / Verilog HDL
CO3 Design and implement combinational circuits
CO4 Design and implement synchronous sequential circuits
CO5 Design and implement asynchronous sequential circuits

REFERENCES:

1. Morris Mano M. and Michael D. Ciletti, "Digital Design", Pearson Education, 2015
2. John F. Wakerly, "Digital Design Principles and Practices", Seventh Edition, Pearson Education, 2015
3. Charles H. Roth Jr, "Fundamentals of Logic Design", Fifth Edition – Jaico Publishing House, Mumbai, 2013.
4. Donald D. Givone, "Digital Principles and Design", Tata Mcgraw Hill, 2013.
5. Kharate G. K., "Digital Electronics", Oxford University Press, 2010
6. http://nptel.ac.in

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1702IT303	PRINCIPLES OF COMMUNICATION	L	T	P	C
		3	0	0	3

PREREQUISITE :

Basic Electrical and Electronics Engineering

COURSE OBJECTIVES:

This course is a graduate level introduction to the basic principles of digital communication systems. A digital communication system is one that transmits a source (voice, video, data, etc.) from one point to another, by first converting it into a stream of bits, and then into symbols that can be transmitted over channels (cable, wireless, storage, etc.). The use of the digital bit-stream as the interface between the source and the channel is universal regardless of what kind of source and channel are involved.

UNIT I FUNDAMENTALS OF ANALOG COMMUNICATION **9 Hours**

Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation FM andPM waveforms, phase deviation and modulation index, frequency deviation and percent modulation,Fr equency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves

UNIT II DIGITAL COMMUNICATION **9 Hours**

Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, F SK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK.

UNIT III DIGITAL TRANSMISSION **9 Hours**

Introduction, Pulse modulation,PCM sampling, sampling rate, signal to quantization noise rate,companding a nalog and digital percentage error, delta modulation, adaptive delta modulation, differentialpulse code modul ation, pulse transmission – Intersymbol interference, eye patterns.

UNIT IV SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES **9 Hours**

Introduction, Pseudonoise sequence, DS spread spectrum with coherent binary PSK, processing ga, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications

UNIT V SATELLITE AND OPTICALCOMMUNICATION **9 Hours**

Satellite Communication Systems-Keplers Law,LEO and GEO Orbits, footprint, Link model Optical Communication Systems-Elements of Optical Fiber Transmission link, Types, Losses, Sources and Detectors.

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

1. Mobile Communications
2. Wireless Communications

COURSE OUTCOMES: Employability

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

CO1 Understand the concepts of analog communication techniques
CO2 Understand the concepts of digital communication techniques
CO3 Explain various digital communication techniques with keying principles
CO4 Analyze the performance Spread Spectrum and multiple access techniques
CO5 Explain satellite and optical communication

REFERENCES:

1. Wayne Tomasi, " Advanced Electronic Communication Systems", Pearson Education, 2016.
2. Simon Haykin, "Communication Systems", 7th Edition, John Wiley & Sons. 2012.
3. H.Taub, D L Schilling ,G Saha ,"Principles of Communication"3/e,2011.
4. B.P.Lathi,"Modern Analog And Digital Communication systems", 3/e, Oxford University Press, 2012
5. Blake, "Electronic Communication Systems", Thomson Delmar Publications, 2012.
6. Martin S.Roden, "Analog and Digital Communication System", 5th Edition, PHI, 2012
7. http://nptel.ac.in
8. http://coursera.org

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1702IT304	COMPUTER ORGANIZATION AND ARCHITECTURE	L	T	P	C
		3	0	0	3

PREREQUISITE :

COURSE OBJECTIVES:

1. To make students understand the basic structure and operation of digital computer.
2. To study the concepts of pipelining.
3. To expose the students to the concept of parallelism
4. To familiarize the students with hierarchical memory system including cache memories and virtual memory.

UNIT I STRUCTURE OF COMPUTERS & MACHINE INSTRUCTION **9 Hours**

Introduction, Technologies for building Processors and Memory, Performance, The Power Wall, Operations of the Computer Hardware, Operands of the Computer Hardware, Signed and Unsigned numbers, Representing Instructions in the Computer, Logical Operations, Instructions for Making Decisions, Supporting Procedures in Computer Hardware, Communicating with People.

UNIT II PROCESSING UNIT **9 Hours**

MIPS Addressing for 32-Bit Immediate and Addresses, Parallelism and Instructions: Synchronization, Translating and Starting a Program, Addition and Subtraction, Multiplication, Division, Floating Point, Parallelism and Computer Arithmetic: Sub word Parallelism, Real Stuff: Streaming SIMD Extensions and Advanced Vector Extensions in x86.

UNIT III PIPELINING **9 Hours**

Logic Design Conventions, Building a Datapath, A Simple Implementation Scheme, An overview of Pipelining, Pipelined Datapath and Control, Data Hazards: Forwarding versus Stalling, Control Hazards, Exceptions, Parallelism via Instructions, Real Stuff: The ARM Cortex – A8 and Intel Core i7 Pipelines, Going Faster: Instruction –Level Parallelism and Matrix Multiply. An Introduction to Digital Design Using a Hardware Design Language to Describe and Model a Pipeline.

UNIT IV MEMORY **9 Hours**

Memory Technologies, the Basics of Caches, Measuring and Improving Cache Performance, dependable memory hierarchy, Virtual Machines, Virtual Memory, A Common Framework for Memory Hierarchy, Using a Finite- State Machine to Control a Simple Cache, Parallelism and Memory Hierarchy: Redundant Arrays of Inexpensive Disks, Advanced Material: Implementing Cache Controllers, Real Stuff: The ARM Cortex-A8 and Intel Core i7 Memory Hierarchies, Going Faster: Cache Blocking and Matrix Multiply.

UNIT V DISK STORAGE **9 Hours**

Disk Storage and Dependability-RAID levels-hardware multi threading-clusters- message passing multiprocessors-Multiprocessors network topologies.

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

1. Introduction to Multi Core Programming
2. Working principles of Intel and AMD Processor

COURSE OUTCOMES: Skill Development

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

CO1 Understand the concepts of structure of computers and machine instructions
CO2 Explain the concepts of processing units
CO3 Design and analyze pipelined control units
CO4 Evaluate performance of memory systems
CO5 Understand disk storage and apply RAID concepts in real time problems

REFERENCES:

1. David A. Patterson and John L. Hennessey, "Computer organization and design, The Hardware/Software interface", Morgan Kauffman / Elsevier, Fifth edition, 2014.
2. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", 5th Edition, Tata McGraw Hill, 2013.
3. William Stallings, —Computer Organization and Architecture – Designing for Performancel, Sixth Edition, Pearson Education, 2013.
4. V.P. Heuring, H.F. Jordan, —Computer Systems Design and Architecturel, Second Edition, Pearson Education, 2015.
5. Behrooz Parhami, —Computer Architecturel, Oxford University Press, 2012.
6. http://nptel.ac.in

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1702CSX02	DATABASE MANAGEMENT SYSTEMS (Common to B.E CSE and B.Tech IT Programmes)	L	T	P	C
		3	0	0	3

PREREQUISITE:

1. Programming in C
2. Programming in C++

COURSE OBJECTIVES:

1. To understand the fundamentals of data models and conceptualize and depict a database system using ER diagram
2. To make a study of SQL and relational database design
3. To know about data storage techniques a query processing.
4. To impart knowledge in transaction processing, concurrency control techniques and recovery procedures.
5. To familiarize the students with the different types of databases.

UNIT I INTRODUCTION **9 Hours**

Introduction to database - Data Base Architecture - Data Independence - Functional Dependencies — Relational Algebra-Entity relationship model - mapping cardinalities-keys, E-R diagrams.

UNIT II QUERY LANGUAGE & OPTIMIZATION **9 Hours**

Relational Calculus – Tuple Relational Calculus – Domain Relational Calculus - SQL — DDL- DML-DCL-TCL-Embedded SQL-Static Vs Dynamic SQL - Views – Constraints – Query processing and optimization- - Normal Forms – 1NF to 5NF-Domain Key Normal Form

UNIT III TRANSACTION PROCESSING **9 Hours**

Transaction Processing – Properties of Transactions –Serializability - Concurrency Control-Locking Mechanisms – Time Stamp ordering –Two phase Commit Protocol-Deadlock-Recovery systems-Log-based recovery.

UNIT IV FILES AND INDEXING **9 Hours**

Overview of Physical Storage Media-RAID -File Organization-File operations – Hashing Techniques – Indexing -Single level and Multi-level Indexes-B+ tree Index Files-B tree Index Files.

UNIT V ADVANCED TOPICS **9 Hours**

Data warehousing, heterogeneous component systems-Data mining and knowledge discovery-OODBMS-Object Relational Databases –XML Data Base - Cloud based systems – NOSQL introduction -Hbase data model -Database Tuning -Case Study for Design and Manage the Database for any Project.

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

1. Advanced Database Technology
2. Data mining and Data warehousing, Data Analytics

COURSE OUTCOMES: Employability

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

CO1 Understand the basic concepts of the database and data models
CO2 Illustrate a database using ER diagrams and map ER into Relations and normalize the Relations
CO3 Acquire the knowledge of query evaluation to monitor the performance of the DBMS
CO4 Acquire the knowledge about different special purpose databases and to critique how they differ from traditional database systems
CO5 Explain the basic concepts of distributed databases, XML and Database Security

REFERENCES:

1. Abraham Silberschatz, Henry F.Korth and S.Sundarshan "Database System Concepts", Sixth Edition, McGraw Hill, 2017.
2. Ramez Elmasri and Shamkant B. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education, 2013.
3. Thomas M. Connolly and Carolyn E. Begg, —Database Systems - A Practical Approach to Design, Implementation, and Managementl, fifth edition, Pearson Education, 2011
4. C.J.Date, A.Kannan and S.Swamynathan, —An Introduction to Database Systemsl, Eighth Edition, Pearson Education, 2012.
5. Raghu Ramakrishnan, —Database Management Systemsl, Fourth Edition, McGraw-Hill College Publications, 2015.
6. Frank. P. Coyle, "XML, Web Services And The Data Revolution", Pearson Education, 2012
7. http://nptel.ac.in/

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8. http://coursera.org/

1702CSX52 **DATABASE MANAGEMENT SYSTEMS LAB** (Common to B.E CSE and B.Tech IT Programmes)

L	T	P	C
0	0	2	1

PREREQUISITE:

1. Programming in C
2. Programming in C++

COURSE OBJECTIVES:

1. Learn to create and use a database
2. Be familiarized with a query language
3. Have hands on experience on DDL Commands
4. Have a good understanding of DML Commands and DCL commands
5. Familiarize advanced SQL queries.
6. Be exposed to different applications

LIST OF EXPERIMENTS:

1. DDL and DML commands
2. Transaction control commands and aggregate functions
3. Joins and Nested Queries
4. Constraints and Views
5. High level programming language extensions (Control structures, Procedures and Functions).
6. Cursors and Triggers
7. Embedded SQL
8. Procedures, Functions and Report
9. Database Design and implementation with any one front end tool (Mini Project)
   a. Sample list of Projects
   b. Hospital management
   c. Railway ticket reservation
   d. Student Mark list processing
   e. Employee pay roll processing
   f. Inventory control

TOTAL: 45 HOURS

REQUIREMENTS:

Hardware:

Standalone desktops 30 Nos. (or) Server supporting 30 terminals or more.

Software:

Front end : Visual Studio or Java or Equivalent
Back end : Oracle / MySQL/ Sql Server DB2 or Equivalent.

ADDITIONAL EXPERIMENTS / INNOVATIVE EXPERIMENTS:

Under MoU with Oracle Academy, a programme Oracle Workforce Development Programme (OWDP) is conducted. In this programme extensive hands-on training on SQL and PL/SQL will be given to students during the Lab sessions.

1. Writing SQL queries for Hierarchical retrieval of data (tree structured data)
2. Querying Data Dictionary static Views
3. Using stored procedures and Functions for implementing object level data security

COURSE OUTCOMES:

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

CO1 Design and implement a database schema for a given problem-domain
CO2 Create and maintain tables using various PL/SQL statements
CO3 Apply Triggers, Views and Embedded SQL commands to solve real time problems
CO4 Create reports using functions and procedures
CO5 Apply front end and back end tools for real time projects

Skill Development
Employability

REFERENCES:

1. http://ilearning.oracle.com
2. http://coursera.org/
3. http://nptel.ac.in/
4. DBMS Lab Manual by EGSPEC

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1704GE351	LIFE SKILLS : SOFT SKILLS (Common to all B.E / B.Tech Degree Programmes)	L	T	P	C
		0	0	2	1

PREREQUISITE :

1. Technical English
2. Communicative English

COURSE OBJECTIVES:

1. To develop the students basic soft skills and enable them to get a job.
2. To develop the students' interpersonal skills and to enable them to respond effectively.
3. To develop the students selling skills and to enable them to apply in their interview process.
4. To develop the students' Corporate Etiquettes and enable them to respond effectively.
5. To develop the students' learning by practice of giving different situations.

UNIT I INTRODUCTION TO SOFT SKILLS — **6 Hours**

Soft Skills an Overview - Basics of Communication – Body Language – Positive attitude –Improving Perception and forming values – Communicating with others.

UNIT II TEAM Vs TRUST — **6 Hours**

Interpersonal skills – Understanding others – Art of Listening - Group Dynamics – Networking – Individual and group presentations - Group interactions – Improved work Relationship .

UNIT III SELLING ONESELF — **6 Hours**

How to brand oneself – social media – job hunting – Resume writing – Group Discussion – Mock G.D - .Interview skills – Mock Interview

UNIT IV CORPORATE ETIQUETTES — **6 Hours**

What is Etiquette – Key Factors – Greetings – Meeting etiquettes – Telephone etiquettes – email etiquettes – Dining etiquettes – Dressing etiquettes – Rest room etiquettes – Life etiquettes.

UNIT V LEARNING BY PRACTICE — **6 Hours**

1. My family. Myself. 2. Meeting people. Making Contacts. 3. A city. Getting about town. 4. Our flat. Home life.5. Travelling. Going abroad. 6. Going through Customs. 7. At a hotel. 8. Shopping. 9. Eating out. 10. Making a phone call. 11. A modern office.12 Discussing business.

TOTAL: 30 HOURS

ASSSESSMENT PATTERN

1. Two assignments (2 x 25 marks = 50 marks)
2. Pragmatic assessment (50 marks)

COURSE OUTCOMES: Skill Development

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

- CO1 Communicate effectively in their business environment.
- CO2 Improve their interpersonal skills which are mandatory in a corporate world.
- CO3 Brand themselves to acquire a job.
- CO4 Involve in corporate etiquettes.
- CO5 Survive in the different situations.

REFERENCES:

1. Dr.K.Alex, _Soft Skills' Third Edition, S.Chand & Publishing Pvt Limited, 2009
2. Aruna Koneru, _Professional Communication' Second Edition, Tata McGraw-Hill Education, 2008
3. D.K.Sarma, _You & Your Career' First Edition, Wheeler Publishing & Co Ltd, 1999
4. Shiv Khera _You Can Win' Third Edition, Mac Millan Publisher India Pvt Limited, 2005

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IV

1701MA401	PROBABILITY AND QUEUEING THEORY (Common to B.E / B.Tech – CSE, IT)	L	T	P	C
		3	2	0	4

PREREQUISITE:

Engineering Mathematics I
Engineering Mathematics II
Engineering Mathematics III

COURSE OBJECTIVES:

1. To establish the necessary background in basic probability tools and concepts.
2. To provide students with the ability to understand and conduct computer systems modeling and performance analysis.
3. To emphasis on more advance topics that are particularly useful in modeling, such as Markov models and queuing theory.

UNIT I PROBABILITY AND RANDOM VARIABLES **12 Hours**

Probability- Conditional probability-Baye's theorem-Discrete and continuous random variables –Expectation-Variance- Moments – Moment generating functions –Real Time Problems

UNIT II THEORETICAL DISTRIBUTIONS **12 Hours**

Discrete Distributions: Binomial, Poisson, Geometric - Continuous Distributions: Uniform, Exponential, Normal, Gamma distributions - Application of Distribution in Engineering Problems

Unit III TWO - DIMENSIONAL RANDOM VARIABLES **12 Hours**

Joint distributions – Marginal and conditional distributions – Covariance – Correlation and Linear regression

UNIT IV RANDOM PROCESSES **12 Hours**

Classification – Stationary process – Markov process - Poisson process – Discrete parameter - Markov chain – Chapman Kolmogorov equations – Limiting distributions.

UNIT V QUEUEING MODELS **12 Hours**

Birth and Death processes – Single and multiple server queueing models – Little's formula - Queues with finite waiting rooms- Computer Science Applications - Finite source models - M/G/1 queue – Pollaczek-Khinchine formula - M/D/1 and M/EK/1 as special case

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

1.Transformation of random variables.
2.Series queues, Jackson networks.

COURSE OUTCOMES: Skill Development

After completion of the course, Students will be able to

CO1: Determine the parameters of unpredictable experiments using probability concepts.
CO2: Construct probabilistic models for observed phenomena through discrete and continuous distributions.
CO3: Associate the random variables, by designing joint distribution and correlate the random variables.
CO4: Make use of discrete time Markov chains in probabilistic manner, to model computer systems.
CO5: Solve the queuing approaches problems using basic characteristics of queuing theory.
CO6: Utilize the queuing models to minimize the time of service in a queuing system.

REFERENCES:

1. Ibe.O.C., "Fundamental of Applied Probability and random Processes", Elsevier, Ist Indian Reprint, 2007
2. Gross.D and Harris C.M, "Fundamentals of Queuing Theory", Wiley Student Edition, 2004.
3. Robertazzi, "Computer Networks and Systems: Queuing Theory and performance Evaluation", Springer, 3rd Edition, 2006
4. TahaH.A."Operations Research", Pearson education, Asia, 8th Edition, 2007
5. Trivedhi K.S, "Probability and statistics with Reliability, queuing and Computer Science Applications", John Wiley and Sons, 2nd Edition, 2002
6. nptel.ac.in/courses/111105035, www.nptelvideos.in/2012/11/Mathematics.html
7. www.learnerstv.com/Free-maths-video lectures - ltv348-page1.html

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1702IT401	SOFTWARE ENGINEERING AND PROJECT MANAGEMENT	L	T	P	C
		3	0	0	3

PREREQUISITE :

1. Programming in C++.
2. Java Programming.
3. Database Management Systems.

COURSE OBJECTIVES:

1. Understand the phases in a software project.
2. Understand fundamental concepts of requirements engineering and Analysis Modeling.
3. Learn various testing and maintenance measures.
4. To learn Aspect Oriented Programming Concepts.
5. To outline the need for Software Project Management and to highlight different techniques for software cost estimation and change management.

UNIT I SOFTWARE PROCESS AND SPECIFICATIONS **9 Hours**

Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models, Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management.

UNIT II SOFTWARE DESIGN **9 Hours**

Overview of System Design -System Design Concepts – System Design Activities – Addressing Design Goals – Managing System Design-Architectural Design -User Interface Design-Component level.

UNIT III SOFTWARE IMPLEMENTATION AND TESTING **9 Hours**

Software Implementation Techniques: Coding practices-Refactoring- Software testing fundamentals & Techniques: White box testing- Black box testing-Case study- Levels of testing: Unit Testing, Integration Testing – System Testing and Debugging-Regression Testing- Acceptance testing-reverse engineering and re-engineering.

UNIT IV ASPECT ORIENTED SOFTWARE DEVELOPMENT **9 Hours**

AO Design Principles -Separations of Concerns, Subject Oriented Decomposition, Traits, Aspect Oriented Decomposition, Theme Approach, Designing Base and Crosscutting Themes, Aspect-Oriented Programming using Aspect-J.

UNIT V SOFTWARE PROJECT MANAGEMENT AND CONTROL **9 Hours**

Estimation – FP Based, LOC Based, Make/Buy Decision, COCOMO Models - Project Plan, Planning Process, RFP Risk Management – Identification, Projection, RMMM - Scheduling and Tracking –Process and Project Metrics- Document Preparation and Production- Cost monitoring – Earned Value Analysis – Change control-Software Configuration Management – Managing contracts – Contract Management-Managing people.

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

Software Development - Software Testing - Software Quality Assurance - Software Configuration Management.

COURSE OUTCOMES:

After completion of the course, Student will be able to

CO1: Compare different Process models. Employability
CO2: Understand different types of requirements and requirement Engineering process.
CO3: Understand the systematic procedure for software design and deployment. Entrepreneurship
CO4: Compare and contrast the various testing and maintenance.
CO5: Understand the concept of change management during development.
CO6: Explain the basic concepts of AOP.

REFERENCES:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Seventh Edition, Mc Graw-Hill International Edition, 2017.
2. Bernd Bruegge, Alan H Dutoit, Object-Oriented Software Engineering, 2nd ed, Pearson Education, 2014
3. Craig Larman, Applying UML and Patterns, 3rd ed, Pearson Education, 2015.
4. Stephen Schach, Software Engineering 7th ed, McGraw-Hill, 2015.
5. AspectJ in Action, Ramnivas Laddad, Manning Publications, 2013
6. Aspect-Oriented Software Development, Robert E. Filman, TzillaElrad, Siobhan Clarke, and Mehmet Aksit, October 2014.
7. http://nptel.ac.in/

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1702IT402	JAVA PROGRAMMING	L	T	P	C
		2	0	4	4

PREREQUISITE:

1. Programming in C & C++.
2. Database Management Systems.

COURSE OBJECTIVES:

1. Enable learners to write Java programming using Object Oriented Programming Concepts
2. Develop Java programming using Event Driven and Strings.
3. Familiar with Swings concepts using Java.
4. Learn to think Java program using real time concepts and paradigms.

UNIT I CLASSES AND OBJECTS **8 Hours**

Object oriented Programming – Objects - Classes – Encapsulation – Methods – Constructor – Java Documents

UNIT II ARRAYS, STRINGS, INHERITANCE **8 Hours**

I/O operations - Arrays – Strings – Inheritance – Interface- Polymorphism

UNIT III EVENT DRIVEN PROGRAMMING **8 Hours**

Packages - Events Handlers - Applets – Swings – Exception

UNIT IV CONNECTIVITY **8 Hours**

ODBD-JDBC – Servlet – JSP – Scripting – Threading

LIST OF EXPERIMENTS:

MODULE – 1 **12 Hours**

1. Study of key features of the Java language, intro to the Java Development Kit (JDK) and Java Virtual Machine.
2. Play with Data types, keywords, encapsulation, conditional and control statements, looping, branching.
3. Implement Java programming concepts using Classes and Objects.
4. Implement Java programming concepts using Arrays, Inheritance and Interfaces.
5. Perform event handlers program using Java.

MODULE – 2 **16 Hours**

1. Design a class for Complex numbers in Java. In addition to methods for basic operations on complex numbers, provide a method to return the number of active objects created.
2. Develop a simple paint-like program that can draw basic graphical primitives in different dimensions and colors. Use appropriate menu and buttons.
3. Develop a scientific calculator using even-driven programming paradigm of Java.
4. Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and Fibonacci number.
5. Develop Mini-Project for Library Automation System using Events, JDBC and Exception Handling.

Requirement for a batch of 30 students

Software:

Operating System: Windows /Linux operating system
Tool: JDK 1.6 (or above)
IDE: Net beans or Eclipse

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

J2EE, J2ME, Mobile Application Development, Software Development.

COURSE OUTCOMES: Employability

After completion of the course, Student will be able to

CO1: Understand the basic concepts of Java Programming.
CO2: Develop Java program using classes, objects, and encapsulation.
CO3: Design Inheritance and Interface using Java.
CO4: Implement Event Handler, JDBC and Exception Handling concepts using Java.
CO5: Create real time application using Java.

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1702IT403	INTERNET OF THINGS	L	T	P	C
		2	4	0	4

PREREQUISITE :

1. Basic Programming Knowledge.
2. Computer Architecture.

COURSE OBJECTIVES:

1. Study the concept of Microprocessor and Microcontrollers.
2. Study what is Internet of Things and learning concepts.
3. Get basic knowledge of RFID technology, sensor technology and satellite technology.
4. Students aware of resource management and security issues in Internet of Things.
5. Study the concept of Internet of Things in the real world scenario.

UNIT I MICROPROCESSOR AND MICROCONTROLLERS **9 Hours**

Evolution of Microprocessors – Architecture of Intel 8085 Microprocessor - Addressing modes - Intel 8086 microprocessor – Microprocessor architecture - Architecture of Intel 8051microcontroller

UNIT II EXPERIMENTS USING MICROPROCESSOR AND MICROCONTROLLERS **9 Hours**

8085 programs - Arithmetic and Logical operations, Code conversion, Traffic light control, Stepper motor control, Key board and Display interface.

8086 programs - Data block without overlap, Floating Point Operations, Password checking, Print RAM size and system date, Printer status, Serial interface and Parallel interface.

8051 programs - Arithmetic and Logical operations, Square and Cube program, Find 2"s complement of a number Unpacked BCD to ASCII.

UNIT III INTRODUCTION TO IOT **9 Hours**

What is the Internet of Things: History of IoT, About IoT, Overview and Motivations, Examples of Applications, Internet of Things Definitions and Frameworks: IoT Definitions, IoT Architecture, General Observations, ITU-T Views, Working Definition, IoT Frameworks, Basic Nodal Capabilities.

UNIT IV IOT PROTOCOLS **9 Hours**

Sensors - Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Issues with IoT Standardization – Unified Data Standards.

UNIT V CASE STUDY **8 Hours**

IEEE 802.15.4 – BACNet Protocol– Modbus – KNX – Zigbee Architecture - Software & Management Tools for IoT.

UNIT VI BUILDING IOT WITH RASPBERRY PI AND GALILEO/ARDUINO **8 Hours**

Physical device – Raspberry Pi Interfaces – Programming – APIs / Packages – Web services - Intel Galileo Gen2 with Arduino- Interfaces - Arduino IDE – Programming - APIs and Hacks – path planning – obstacle avoidance technique.

UNIT VII EXPERIMENTS USING IOT **8 Hours**

Home Automation – Cities – Environment – Energy – Retail – Logistics - Agriculture - Industry - Health and Lifestyle - IoT and M2M.

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

Raspberry PI and Arduino Tool Kit

COURSE OUTCOMES: Employability

After completion of the course, Student will be able to

CO1: Understand the microprocessor and microcontrollers.
CO2: Apply microprocessor and microcontrollers concepts to solve various problems.
CO3: Explain the concepts of IoT and protocols.
CO4: Illustrate various case studies and protocol architecture.
CO5: Develop a portable IOT using Arduino or equivalent boards and relevant protocols.
CO6: Analyze applications of IOT in real time scenario.

REFERENCES:

1. Romesh Gaonkar , "Microprocessor Architecture, Programming, and Applications with the 8085", Penram International Publishing (India) LTD, 2017.
2. Yu-Cheng Liu, Glenn A.Gibson, "Microcomputer Systems: The 8086 / 8088 Family - Architecture, Programming and Design", Second Edition, Prentice Hall of India, 2014.
3. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", Second Edition, Pearson Education, 2013.
4. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Willy Publications. 2017.
5. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3- 642-19156-5 e-ISBN 978-3-642-19157-2, Springer.,2016.
6. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015.
7. http://nptel.ac.in
8. http://coursera.org

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1702IT404	OPERATING SYSTEMS	L	T	P	C
		3	0	2	4

PREREQUISITE :

1. Programming in C & C++.
2. Database Management Systems
3. Computer Architecture.

COURSE OBJECTIVES:

1. To Study the basic concepts and functions of operating systems.
2. Learn about Processes, Threads and Scheduling algorithms.
3. Understand the principles of concurrency and Deadlocks.
4. Learn various memory management schemes.
5. Learn the basics of Linux system and perform administrative tasks on Linux Servers.

UNIT I INTRODUCTION AND PROCESS MANAGEMENT **9 Hours**

Operating system functions and characteristics - historical evolution of operating systems - Different types of Operating Systems - Issues in operating system design. Process abstraction - process address space - process management - system calls, threads - process hierarchy.

UNIT II CPU SCHEDULING AND DEADLOCK **9 Hours**

Levels of scheduling, comparative study of scheduling algorithms – Dead Lock: Characterization, Prevention Detection, Avoidance and Recovery.

UNIT III CONCURRENT PROCESSES AND MEMORY MANAGEMENT **9 Hours**

Critical section problem: Semaphores, monitors, Inter-process communication, message passing - Storage allocation methods, virtual memory concept, demand paging, page replacement algorithms, segmentation, thrashing.

UNIT IV FILE SYSTEMS AND DEVICE MANAGEMENT **9 Hours**

Functions, file access and allocation methods, directory system, file protection mechanisms, implementation issues, file system hierarchy. Hardware organization, device scheduling policies, device drivers.

UNIT V CASE STUDY **9 Hours**

Linux System- Basic Concepts; System Administration-Requirements for Linux System Administrator, Setting up a LINUX Multifunction Server, Domain Name System, Setting Up Local Network Services; Virtualization- Basic Concepts, Setting Up Xen, VMware on Linux Host and Adding Guest OS.

LIST OF PROGRAMS **15 Hours**

1. Installing of operating system and resource allocation.
2. Shell Programming: Creating a script, making a script executable, shell syntax (variables, conditions, control structures, functions, commands).
3. Simulate the following CPU scheduling algorithms.
4. Simulate Bankers Algorithm for Dead Lock Avoidance.
5. Simulate Bankers Algorithm for Dead Lock Prevention.
6. Simulate all file allocation strategies.
7. Process synchronization using semaphores.
8. Simulate all File Organization Techniques.
9. Simulate all page replacement algorithms.
10. Study of Linux OS, Microsoft, Mobile OS.

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

Android, iOS

COURSE OUTCOMES: Employability

After completion of the course, Student will be able to

CO1: Understand the key concepts of operating system, process and process management
CO2: Implement different CPU scheduling algorithms and investigate their merits
CO3: Explain various deadlock scenarios and apply appropriate prevention techniques
CO4: Implement techniques for synchronization of concurrent processes and memory management approach
CO5: Identify and solve problems related to file system and device management system
CO6: Perform administrative tasks on LINUX servers

REFERENCES:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, Operating System Conceptsl, John Wiley & Sons (Asia) Pvt. Ltd, Ninth Edition, 2017.
2. Gary Nutt, —Operating Systems- A Modern Perspectivel, Pearson Education Pvt. Ltd, Second Edition, 2013.
3. Andrew S. Tanenbaum, —Modern Operating Systemsl, 3rd edition Prentice Hall of India Pvt. Ltd, 2015.
4. Harvey M. Deitel, Operating Systemsl, Pearson Education Pvt. Ltd, Third Edition, 2013.
5. William Stallings, Operating Systeml, Pearson Education, Sixth edition, 2015.
6. http://nptel.ac.in

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1702IT405 **COMPUTER NETWORKS**

L	T	P	C
3	0	0	3

PREREQUISITE :

1. Digital Principals and System Design.
2. Principles of Communication.

COURSE OBJECTIVES:

1. Identify the component required to build different types of networks.
2. To learn about the division of network functionalities into layers.
3. Identify solution for each functionality at each layer.
4. Choose the required functionality at each layer for given application.

UNIT I PHYSICAL AND DATA LINK LAYER **9 Hours**

Computer Network – OSI Model – Communication Systems – Protocol and Standards – Wired vs Wireless – Data link layer – Error and Flow Control – Hamming Code – MAC - Case study: CSMA/CD & CA, Token Bus, Token Ring, Hub, Bridges.

UNIT II NETWORK AND TRANSPORT LAYER **9 Hours**

Internetworking – Virtual and Datagram - IP Address: IPv4, IPv6 – Routing: Link state, Distance vector – UDP – TCP – Case study: Switch, Router.

UNIT III ROUTING SERVICES **9 Hours**

Inter domain Routing – RIP – OSPF – BGP – ICMP – ARP – DHCP – Multicast routing.

UNIT IV APPLICATION LAYER **9 Hours**

Link Layer Services – Framing – FTP – Web Services - Email – HTTP – DNS.

UNIT V CASE STUDY **9 Hours**

IEEE Standards - Blue tooth – Wi-Fi – Network Management – SNMP – SNA – QoS – Congestion Control – Gateway.

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

Distributed Computing - Cloud Computing - Network Programming.

COURSE OUTCOMES:

After completion of the course, Student will be able to

CO1: Illustrate the concepts of physical and data link layers } Employability
CO2: Explain the operations of network and transport layers
CO3: Understand various routing services
CO4: Design and implement a networking application incorporating the different layering protocols } Entrepreneur
CO5: Simulate various application layers and real time network manage protocols

REFERENCES:

1. Larry L. Peterson, Bruce S. Davie, Computer Networks: A systems approachl, Fifth Edition, Morgan Kaufmann Publishers, 2016.
2. Forouzan, Behrouz A., and Firouz Mosharraf. "Computer networks: a top-down approach", McGraw-Hill, Special Indian Edition 2016.
3. James F. Kurose, Keith W. Ross, —Computer Networking - A Top-Down Approach Featuring the Internetl, Sixth Edition, Pearson Education, 2013.
4. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, —Computer Networks: An Open Source Approachl, McGraw Hill Publisher, 2012.
5. Nader. F. Mir, —Computer and Communication Networksl, Pearson Prentice Hall Publishers, 2015.
6. http://nptel.ac.in.

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1702IT451 **NETWORKS LAB**

L	T	P	C
0	0	2	1

PREREQUISITE :

Programming Knowledge.

COURSE OBJECTIVES:

The students should be made to learn about the low-level network programming concepts using APIs and Simulation tools.

LIST OF EXPERIMENTS:

1. Write a network application program.
2. Use tools to visualize packet flow
3. Configure Router/Switch to set up network (network administration)
4. Simple Chat Program using TCP Sockets
5. Simulation of HTTP Protocol using TCP Sockets
6. Simulation of Sliding Window Protocol using TCP Sockets
7. Simulation of DNS using UDP Sockets
8. Simulation of Ping using Raw Sockets
9. Learn to use commands like TCP Dump, Netstat, Trace Route
10. Study of TCP/UDP performance using simulation tool
11. Simulate networks using network simulators like NS-2
12. Performance comparison of MAC protocols using simulation tool
13. Performance comparison of Routing protocols using simulation tool

Requirement for a batch of 30 students

JDK1.6 or Equivalent,
Network Simulator - 2

TOTAL: 45 HOURS

ADDITIONAL EXPERIMENTS/ INNOVATIVE EXPERIMENTS:

J2EE, J2ME, Mobile Application Development, Software Development

COURSE OUTCOMES:

After completion of the course, Student will be able to

CO1: Apply and Configure the network using TCP and UDP. Employability
CO2: Simulate various TCP sockets program. } Skill Development
CO3: Simulate various UDP sockets program.
CO4: Compare and Contrast performance of MAC and Routing protocols. Skill development

REFERENCES:

1. Larry L. Peterson, Bruce S. Davie, Computer Networks: A systems approachI, Fifth Edition, Morgan Kaufmann Publishers, 2016
2. Forouzan, Behrouz A., and Firouz Mosharraf. "Computer networks: A top-down approach", McGraw-Hill, Special Indian Edition 2016.
3. James F. Kurose, Keith W. Ross, —Computer Networking - A Top-Down Approach Featuring the InternetI, Sixth Edition, Pearson Education, 2013.
4. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, —Computer Networks: An Open Source ApproachI, McGraw Hill Publisher, 2012.
5. Nader. F. Mir, —Computer and Communication NetworksI, Pearson Prentice Hall Publishers, 2015.
6. http://nptel.ac.in.
7. www.vlab.co.in/broad-area-computer-science-and-engineering.

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1704GE451	LIFE SKILLS: VERBAL ABILITY	L	T	P	C
		0	0	2	1

PREREQUISITE:

Technical English – I and II

COURSE OBJECTIVES:

1. To help students comprehend and use vocabulary words in their day to day communication.
2. To apply appropriate reading strategies for interpreting technical and non-technical documents used in job-related settings.
3. To ensure students will be able to use targeted grammatical structures meaningfully and appropriately in oral and written production.
4. To enable the students to arrange the sentences in meaningful unit and to determine whether constructions rely on active or passive voice.
5. To apply the principles of effective business writing to hone communication skills.

UNIT I VOCABULARY USAGE **6 Hours**

Introduction - Synonyms and Antonyms based on Technical terms – Single word Substitution – Newspaper, Audio and video listening activity.

UNIT II COMPREHENSION ABILITY **6 Hours**

Skimming and Scanning – Social Science passages – Business and Economics passages – latest political and current event based passages – Theme detection – Deriving conclusion from passages.

UNIT III BASIC GRAMMAR AND ERROR DETECTION **6 Hours**

Parallelism – Redundancy – Ambiguity – Concord - Common Errors – Spotting Errors – Sentence improvement – Error Detection FAQ in Competitive exams.

UNIT IV REARRANGEMENT AND GENERAL USAGE **6 Hours**

Jumble Sentences – Cloze Test - Idioms and Phrases – Active and passive voice – Spelling test.

UNIT V APPLICATION OF VERBAL ABILITY **6 Hours**

Business Writing - Business Vocabulary - Delivering Good / Bad News - Media Communication - Email Etiquette – Report Writing - Proposal writing – Essay writing– Indexing –Market surveying.

Total: 30 Hours

ASSESSMENT PATTERN

1. Two assignments (2 x 25 marks = 50 marks)
2. Pragmatic assessment (50 marks)

COURSE OUTCOMES: Skill Development

After completion of the course, Student will be able to

CO1: Use new words in their day to day communication.
CO2: Gather information swiftly while reading passages.
CO3: Students are proficient during their oral and written communication.
CO4: Rearrange the sentences and able to identify the voice of the sentence.
CO5: Students use their knowledge of the best practices to craft effective business documents

REFERENCES:

1. Arun Sharma and Meenakshi Upadhyav, How to Prepare for Verbal Ability and Reading Comprehension for CAT, McGrawHill Publication, Seventh Edition 2017.
2. R S Aggarwal and Vikas Aggarwal , Quick Learning Objective General English, S.Chand Publishing House, 2017.
3. Dr.K.Alex , Soft Skills, S.Chand Publishing House, Third Revise Edition, 2014.
4. Raymond Murphy, Essential English Grammar in Use, Cambridge University press, New Delhi, Third Edition, 2007.

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CS6551 COMPUTER NETWORKS L T P C
3 0 0 3

OBJECTIVES:

The student should be made to:

Understand the division of network functionalities into layers.
Be familiar with the components required to build different types of networks
Be exposed to the required functionality at each layer
Learn the flow control and congestion control algorithms

UNIT I FUNDAMENTALS & LINK LAYER 9

Building a network – Requirements - Layering and protocols - Internet Architecture – Network software – Performance ; Link layer Services - Framing - Error Detection - Flow control

UNIT II MEDIA ACCESS & INTERNETWORKING 9

Media access control - Ethernet (802.3) - Wireless LANs – 802.11 – Bluetooth - Switching and bridging – Basic Internetworking (IP, CIDR, ARP, DHCP,ICMP)

UNIT III ROUTING 9

Routing (RIP, OSPF, metrics) – Switch basics – Global Internet (Areas, BGP, IPv6), Multicast – addresses – multicast routing (DVMRP, PIM)

UNIT IV TRANSPORT LAYER 9

Overview of Transport layer - UDP - Reliable byte stream (TCP) - Connection management - Flow control - Retransmission – TCP Congestion control - Congestion avoidance (DECbit, RED) – QoS – Application requirements

UNIT VAPPLICATION LAYER 9

Traditional applications -Electronic Mail (SMTP, POP3, IMAP, MIME) – HTTP – Web Services – DNS - SNMP

TOTAL: 45 PERIODS

OUTCOMES:

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

Identify the components required to build different types of networks
Choose the required functionality at each layer for given application
Identify solution for each functionality at each layer
Trace the flow of information from one node to another node in the network

Entrepreneurship
Employability

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TEXT BOOK:

Larry L. Peterson, Bruce S. Davie, "Computer Networks: A systems approach", Fifth Edition, Morgan Kaufmann Publishers, 2011.

REFERENCES:

James F. Kurose, Keith W. Ross, "Computer Networking - A Top-Down Approach Featuring the Internet", Fifth Edition, Pearson Education, 2009.

Nader. F. Mir, "Computer and Communication Networks", Pearson Prentice Hall Publishers, 2010.

Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", Mc Graw Hill Publisher, 2011.

Behrouz A. Forouzan, "Data communication and Networking", Fourth Edition, Tata McGraw – Hill, 2011

IT6501 **GRAPHICS AND MULTIMEDIA** **L T P C**
3 0 0 3

OBJECTIVES:

The student should be made to:

Develop an understanding and awareness of how issues such as content, information architecture, motion, sound, design, and technology merge to form effective and compelling interactive experiences for a wide range of audiences and end users.

Be familiar with various software programs used in the creation and implementation of multi-media (interactive, motion/animation, presentation, etc.).

Be aware of current issues relative between new emerging electronic technologies and graphic design (i.e. social, cultural, cognitive, etc).

understand the relationship between critical analysis and the practical application of design.

Appreciate the importance of technical ability and creativity within design practice.

UNIT I OUTPUT PRIMITIVES 9

Basic – Line – Curve and ellipse drawing algorithms – Examples – Applications - Attributes – Two- Dimensional geometric transformations – Two-Dimensional clipping and viewing – Input techniques.

UNIT II THREE-DIMENSIONAL CONCEPTS 9

Three-Dimensional object representations – Three-Dimensional geometric and modeling transformations – Three-Dimensional viewing – Hidden surface elimination Color models – Virtual reality - Animation.

UNIT III MULTIMEDIA SYSTEMS DESIGN 9

Multimedia basics – Multimedia applications – Multimedia system architecture – Evolving technologies for multimedia – Defining objects for multimedia systems – Multimedia data interface standards – Multimedia databases.

UNIT IV MULTIMEDIA FILE HANDLING 9

Compression and decompression – Data and file format standards – Multimedia I/O technologies – Digital voice and audio – Video image and animation – Full motion video – Storage and retrieval technologies.

UNIT V HYPERMEDIA 9

Multimedia authoring and user interface – Hypermedia messaging – Mobile messaging – Hypermedia message component – Creating hypermedia message – Integrated multimedia message standards – Integrated document management – Distributed multimedia systems.

TOTAL: 45 PERIODS

OUTCOMES: Entrepreneurship

Upon completion of the course, the student should be able to:

Effectively and creatively solve a wide range of graphic design problems
Form effective and compelling interactive experiences for a wide range of audiences.
Use various software programs used in the creation and implementation of multi-media (interactive, motion/animation, presentation, etc.).
Discuss issues related to emerging electronic technologies and graphic design

TEXT BOOKS:

Donald Hearn and M. Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.

Andleigh, P. K and Kiran Thakrar, "Multimedia Systems and Design", PHI, 2003.

REFERENCES:

Judith Jeffcoate, "Multimedia in practice: Technology and Applications", PHI, 1998.
Foley, Vandam, Feiner and Huges, "Computer Graphics: Principles and Practice", 2nd Edition, Pearson Education, 2003.

CS6502 OBJECT ORIENTED ANALYSIS AND DESIGN L T P C 3 0 0 3

OBJECTIVES:

The student should be made to:

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

UNIT I UML DIAGRAMS 9

Introduction to OOAD – Unified Process - UML diagrams – Use Case – Class Diagrams– Interaction Diagrams – State Diagrams – Activity Diagrams – Package, component and Deployment Diagrams

Cohesion – Controller - Design Patterns – creational - factory method - structural – Bridge – Adapter - behavioral – Strategy – observer

UNIT III CASE STUDY 9

Case study – the Next Gen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization - Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies - Aggregation and Composition

UNIT IV APPLYING 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 VCODING 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

OUTCOMES:

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

Design and implement projects using OO concepts
Use the UML analysis and design diagrams Entrepreneurship
Apply appropriate design patterns
Create code from design
Compare and contrast various testing techniques Employability

TEXT BOOK:

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

REFERENCES:

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

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IT6502 DIGITAL SIGNAL PROCESSING L T P C 3 1 0 4

OBJECTIVES:

To introduce discrete Fourier transform and its applications.
To teach the design of infinite and finite impulse response filters for filtering undesired signals.
To introduce signal processing concepts in systems having more than one sampling frequency.

UNIT I SIGNALS AND SYSTEMS 9

Basic elements of DSP – concepts of frequency in Analog and Digital Signals – sampling theorem – Discrete – time signals, systems – Analysis of discrete time LTI systems – Z transform – Convolution – Correlation.

UNIT II FREQUENCY TRANSFORMATIONS 9

Introduction to DFT – Properties of DFT – Circular Convolution - Filtering methods based on DFT – FFT Algorithms - Decimation – in – time Algorithms, Decimation – in – frequency Algorithms – Use of FFT in Linear Filtering – DCT – Use and Application of DCT.

UNIT III IIR FILTER DESIGN 9

Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (LPF, HPF, BPF, BRF) filter design using frequency translation.

UNIT IV FIR FILTER DESIGN 9

Structures of FIR – Linear phase FIR filter – Fourier Series - Filter design using windowing techniques (Rectangular Window, Hamming Window, Hanning Window), Frequency sampling techniques

UNIT V FINITE WORD LENGTH EFFECTS IN DIGITAL FILTERS 9

Binary fixed point and floating point number representations – Comparison - Quantization noise – truncation and rounding – quantization noise power- input quantization error- coefficient quantization error – limit cycle oscillations-dead band- Overflow error-signal scaling.

TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES: Employability

Upon completion of the course, students will be able to

Perform frequency transforms for the signals.
Design IIR and FIR filters.
Finite word length effects in digital filters

TEXT BOOK:

John G. Proakis and Dimitris G.Manolakis, "Digital Signal Processing – Principles, Algorithms & Applications", Fourth Edition, Pearson Education, Prentice Hall, 2007.

REFERENCES:

Emmanuel C.Ifeachor, and Barrie.W.Jervis, "Digital Signal Processing", Second Edition, Pearson Education, Prentice Hall, 2002.

Sanjit K. Mitra, "Digital Signal Processing – A Computer Based Approach", Third Edition, Tata Mc Graw Hill, 2007.

A.V.Oppenheim, R.W. Schafer and J.R. Buck, Discrete-Time Signal Processing, 8th Indian Reprint, Pearson, 2004.

Andreas Antoniou, "Digital Signal Processing", Tata McGraw Hill, 2006.

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IT6503 WEB PROGRAMMING L T P C 3 1 0 4

OBJECTIVES:

The student should be made to:

Understand the technologies used in Web Programming.
Know the importance of object oriented aspects of Scripting.
Understand creating database connectivity using JDBC.
Learn the concepts of web based application using sockets.

UNIT I SCRIPTING. 9

Web page Designing using HTML, Scripting basics- Client side and server side scripting. Java Script- Object, names, literals, operators and expressions- statements and features- events - windows - documents - frames - data types - built-in functions- Browser object model - Verifying forms.-HTML5- CSS3- HTML 5 canvas - Web site creation using tools.

UNIT II JAVA 9

Introduction to object oriented programming-Features of Java – Data types, variables and arrays – Operators – Control statements – Classes and Methods – Inheritance. Packages and Interfaces – Exception Handling – Multithreaded Programming – Input/Output – Files – Utility Classes – String Handling.

UNIT III JDBC 9

JDBC Overview – JDBC implementation – Connection class – Statements - Catching Database Results, handling database Queries. Networking– InetAddress class – URL class- TCP sockets - UDP sockets, Java Beans –RMI.

UNIT IV APPLETS 9

Java applets- Life cycle of an applet – Adding images to an applet – Adding sound to an applet. Passing parameters to an applet. Event Handling. Introducing AWT: Working with Windows Graphics and Text. Using AWT Controls, Layout Managers and Menus. Servlet – life cycle of a servlet. The Servlet API, Handling HTTP Request and Response, using Cookies, Session Tracking. Introduction to JSP.

UNIT VXML AND WEB SERVICES 9

Xml – Introduction-Form Navigation-XML Documents- XSL – XSLT- Web services-UDDI-WSDL-Java web services – Web resources.

TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES: Employability

Upon Completion of the course, the students will be able to

Design web pages.
Use technologies of Web Programming.
Apply object oriented aspects to Scripting.
Create databases with connectivity using JDBC.
Build web based application using sockets.

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TEXT BOOKS:

Harvey Deitel, Abbey Deitel, Internet and World Wide Web: How To Program, 5th Edition.
Herbert Schildt, Java - The Complete Reference, 7th Edition. Tata McGraw- Hill Edition.
Michael Morrison XML Unleashed Tech media SAMS.

REFERENCES:

John Pollock, Javascript - A Beginners Guide, 3rd Edition — Tata McGraw-Hill Edition.
Keyur Shah, Gateway to Java Programmer Sun Certification, Tata McGraw Hill, 2002.

EC6801 WIRELESS COMMUNICATION **L T P C 3 0 0 3**

OBJECTIVES:

The student should be made to:

Know the characteristic of wireless channel
Learn the various cellular architectures
Understand the concepts behind various digital signaling schemes for fading channels
Be familiar the various multipath mitigation techniques
Understand the various multiple antenna systems

UNIT I WIRELESS CHANNELS 9

Large scale path loss – Path loss models: Free Space and Two-Ray models -Link Budget design – Small scale fading- Parameters of mobile multipath channels – Time dispersion parameters- Coherence bandwidth – Doppler spread & Coherence time, Fading due to Multipath time delay spread – flat fading – frequency selective fading – Fading due to Doppler spread – fast fading – slow fading.

UNIT II CELLULAR ARCHITECTURE 9

Multiple Access techniques - FDMA, TDMA, CDMA – Capacity calculations–Cellular concept- Frequency reuse - channel assignment- hand off- interference & system capacity- trunking & grade of service – Coverage and capacity improvement.

UNIT III DIGITAL SIGNALING FOR FADING CHANNELS 9

Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum Shift Keying, Gaussian Minimum Shift Keying, Error performance in fading channels, OFDM principle – Cyclic prefix, Windowing, PAPR.

UNIT IV MULTIPATH MITIGATION TECHNIQUES 9

Equalisation – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms. Diversity – Micro and Macrodiversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver,

UNIT V MULTIPLE ANTENNA TECHNIQUES 9

MIMO systems – spatial multiplexing -System model -Pre-coding - Beam forming - transmitter diversity, receiver diversity- Channel state information-capacity in fading and non-fading channels.

TOTAL : 45 PERIODS

OUTCOMES: Employability

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

Characterize wireless channels
Design and implement various signaling schemes for fading channels
Design a cellular system
Compare multipath mitigation techniques and analyze their performance
Design and implement systems with transmit/receive diversity and MIMO systems and analyze their performance

TEXTBOOKS:

Rappaport,T.S., "Wireless communications", Second Edition, Pearson Education, 2010.
Andreas.F. Molisch, "Wireless Communications", John Wiley – India, 2006.

REFERENCES:

David Tse and Pramod Viswanath, "Fundamentals of Wireless Communication", Cambridge University Press, 2005.
Upena Dalal, " Wireless Communication", Oxford University Press, 2009.
Van Nee, R. and Ramji Prasad, "OFDM for wireless multimedia communications", Artech House, 2000.

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IT6511 NETWORKS LABORATORY L T P C
0 0 3 2

OBJECTIVES:

The student should be made to:

Learn socket programming.
Be familiar with simulation tools.
Have hands on experience on various networking protocols.

LIST OF EXPERIMENTS:

Implementation of Stop and Wait Protocol and Sliding Window Protocol.
Study of Socket Programming and Client – Server model
Write a code simulating ARP /RARP protocols.
Write a code simulating PING and TRACEROUTE commands
Create a socket for HTTP for web page upload and download.
Write a program to implement RPC (Remote Procedure Call)
Implementation of Subnetting .
Applications using TCP Sockets like
- Echo client and echo server
- Chat
- File Transfer

Applications using TCP and UDP Sockets like
- DNS
- SNMP
- File Transfer

Study of Network simulator (NS).and Simulation of Congestion Control Algorithms using NS
Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
- Link State routing
- Flooding
- Distance vector

TOTAL: 45 PERIODS

REFERENCE:

spoken-tutorial.org

OUTCOMES:

At the end of the course, the student should be able to

Use simulation tools
Implement the various protocols. Employability
Analyse the performance of the protocols in different layers.
Analyze various routing algorithms Skill Development

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

SOFTWARE 30
- C / C++ / Java / Equivalent Compiler
- Network simulator like NS2/Glomosim/OPNET/ Equivalent

HARDWARE 30 Nos
Standalone desktops

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IT6512

WEB PROGRAMMING LABORATORY

L T P C
0 0 3 2

LAB EXERCISES
(For IT branch)

OBJECTIVES:

The student should be made to:

Be familiar with Web page design using HTML / DHTML and style sheets
Be exposed to creation of user interfaces using Java frames and applets.
Learn to create dynamic web pages using server side scripting.
Learn to write PHP database functions.
Learn .Net frame work and RMI

LIST OF EXPERIMENTS:

Write a html program for Creation of web site with forms, frames, links, tables etc
Design a web site using HTML and DHTML. Use Basic text Formatting, Images,
Create a script that asks the user for a name, then greets the user with "Hello" and the user name on the page
Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.
Create a script that prompts the user for a number and then counts from 1 to that number displaying only the odd numbers.
Create a script that will check the field in Assignment 1 for data and alert the user if it is blank. This script should run from a button.
Using CSS for creating web sites
Creating simple application to access data base using JDBC Formatting HTML with CSS.
Program for manipulating Databases and SQL.
Program using PHP database functions.
Write a web application that functions as a simple hand calculator, but also keeps a "paper trail" of all your previous work
Install Tomcat and use JSP and link it with any of the assignments above
Reading and Writing the files using .Net
Write a program to implement web service for calculator application
Implement RMI concept for building any remote method of your choice.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to

Design Web pages using HTML/DHTML and style sheets Skill Development
Design and Implement database applications. Employability
Create dynamic web pages using server side scripting.
Write Client Server applications.

LAB REQUIREMENTS FOR A BATCH OF 30 STUDENTS:

SOFTWARE:

Java, Dream Weaver or Equivalent, MySQL or Equivalent, Apache Server

HARDWARE:

Standalone desktops 30 Nos

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IT6513 CASE TOOLS LABORATORY L T P C
0 0 3 2

OBJECTIVES:

The student should be made to:

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.

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

Suggested domains for Mini-Project:

Passport automation system.
Book bank
Exam Registration
Stock maintenance system.
Online course reservation system
E-ticketing
Software personnel management system
Credit card processing
e-book management system
Recruitment system
Foreign trading system
Conference Management System
BPO Management System
Library Management System
Student Information System

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to

Design and implement projects using OO concepts.
Use the UML analysis and design diagrams. Skill Development
Apply appropriate design patterns. Employability
Create code from design. Entrepreneurship
Compare and contrast various testing techniques

LAB EQUIPMENTS FOR A BATCH OF 30 STUDENTS:

SUGGESTED SOFTWARETOOLS:

Rational Suite (or) Argo UML (or) equivalent, Eclipse IDE and Junit

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SOFTWARE TOOLS Rational Suite Open Source Alternatives: ArgoUML, Visual Paradigm Eclipse IDE and JUnit	30 user License
PCs	30

CS6601 **DISTRIBUTED SYSTEMS** **L T P C**
3 0 0 3

OBJECTIVES:

The student should be made to:

- Understand foundations of Distributed Systems
- Introduce the idea of peer to peer services and file system
- Understand in detail the system level and support required for distributed system
- Understand the issues involved in studying process and resource management

UNIT I INTRODUCTION **7**

Introduction – Examples of Distributed Systems–Trends in Distributed Systems – Focus on resource sharing – Challenges. **Case study:** World Wide Web.

UNIT II COMMUNICATION IN DISTRIBUTED SYSTEM **10**

System Model – Inter process Communication - the API for internet protocols – External data representation and Multicast communication. **Network virtualization:** Overlay networks. **Case study:** MPI **Remote Method Invocation And Objects:** Remote Invocation – Introduction - Request-reply protocols - Remote procedure call - Remote method invocation. **Case study:** Java RMI - Group communication - Publish-subscribe systems - Message queues - Shared memory approaches - Distributed objects - Case study: Enterprise Java Beans -from objects to components

UNIT III PEER TO PEER SERVICES AND FILE SYSTEM **10**

Peer-to-peer Systems – Introduction - Napster and its legacy - Peer-to-peer – Middleware - Routing overlays. **Overlay case studies:** Pastry, Tapestry- Distributed File Systems –Introduction - File service architecture – Andrew File system. **File System:** Features-File model -File accessing models File sharing semantics **Naming:** Identifiers, Addresses, Name Resolution – Name Space Implementation – Name Caches – LDAP.

UNIT IV SYNCHRONIZATION AND REPLICATION **9**

Introduction - Clocks, events and process states - Synchronizing physical clocks- Logical time and logical clocks - Global states – Coordination and Agreement – Introduction - Distributed mutual exclusion – Elections – Transactions and Concurrency Control– Transactions -Nested transactions – Locks – Optimistic concurrency control - Timestamp ordering – Atomic Commit protocols -Distributed deadlocks – Replication – Case study – Coda.

UNIT V PROCESS & RESOURCE MANAGEMENT **9**

Process Management: Process Migration: Features, Mechanism - Threads: Models, Issues, Implementation. **Resource Management:** Introduction- Features of Scheduling Algorithms –Task Assignment Approach – Load Balancing Approach – Load Sharing Approach.

TOTAL: 45 PERIODS

OUTCOMES: Employability

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

Discuss trends in Distributed Systems.
Apply network virtualization.
Apply remote method invocation and objects.
Design process and resource management systems.

TEXT BOOK:

George Coulouris, Jean Dollimore and Tim Kindberg, "Distributed Systems Concepts and Design", Fifth Edition, Pearson Education, 2012.

REFERENCES:

Pradeep K Sinha, "Distributed Operating Systems: Concepts and Design", Prentice Hall of India, 2007.
Tanenbaum A.S., Van Steen M., "Distributed Systems: Principles and Paradigms", Pearson Education, 2007.
Liu M.L., "Distributed Computing, Principles and Applications", Pearson Education, 2004.
Nancy A Lynch, "Distributed Algorithms", Morgan Kaufman Publishers, USA, 2003.

IT6601	MOBILE COMPUTING	L T P C 3 0 0 3

OBJECTIVES:

The student should be made to:

Understand the basic concepts of mobile computing.
Be familiar with the network protocol stack.
Learn the basics of mobile telecommunication system.
Be exposed to Ad-Hoc networks.
Gain knowledge about different mobile platforms and application development .

UNIT I INTRODUCTION 9

Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Applications – Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

UNIT II MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER 9

Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of tCP Window – Improvement in TCP Performance.

UNIT IIIMOBILE TELECOMMUNICATION SYSTEM 9

Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

UNIT IV MOBILE AD-HOC NETWORKS 9

Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security .

UNIT V MOBILE PLATFORMS AND APPLICATIONS 9

Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – M-Commerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.

TOTAL: 45 PERIODS

OUTCOMES: Employability

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

Explain the basics of mobile telecommunication system
Choose the required functionality at each layer for given application
Identify solution for each functionality at each layer
Use simulator tools and design Ad hoc networks
Develop a mobile application.

TEXT BOOK:

Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi – 2012.

REFERENCES:

Jochen H. Schller, "Mobile Communications", Second Edition, Pearson Education, New Delhi, 2007.

Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson Asia Pvt Ltd, 2005.

3. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, 2003.

William.C.Y.Lee,"Mobile Cellular Telecommunications-Analog and Digital Systems", Second Edition,Tata Mc Graw Hill Edition ,2006.

C.K.Toh, "AdHoc Mobile Wireless Networks", First Edition, Pearson Education, 2002.

Android Developers : http://developer.android.com/index.html

Apple Developer : https://developer.apple.com/

Windows Phone Dev Center : http://developer.windowsphone.com

BlackBerry Developer : http://developer.blackberry.com/

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CS6659 ARTIFICIAL INTELLIGENCE L T P C

3 0 0 3

OBJECTIVES:

The student should be made to:

Study the concepts of Artificial Intelligence.
Learn the methods of solving problems using Artificial Intelligence.
Introduce the concepts of Expert Systems and machine learning.

UNIT I INTRODUCTION TO AI AND PRODUCTION SYSTEMS 9

Introduction to AI-Problem formulation, Problem Definition -Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics -Specialized production system- Problem solving methods - Problem graphs, Matching, Indexing and Heuristic functions -Hill Climbing-Depth first and Breath first, Constraints satisfaction - Related algorithms, Measure of performance and analysis of search algorithms.

UNIT II REPRESENTATION OF KNOWLEDGE 9

Game playing - Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic-Structured representation of knowledge.

UNIT IIIKNOWLEDGE INFERENCE 9

Knowledge representation -Production based system, Frame based system. Inference - Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning - Certainty factors, Bayesian Theory-Bayesian Network-Dempster - Shafer theory.

UNIT IV PLANNING AND MACHINE LEARNING 9

Basic plan generation systems - Strips -Advanced plan generation systems – K strips -Strategic explanations -Why, Why not and how explanations. Learning- Machine learning, adaptive Learning.

UNIT V EXPERT SYSTEMS 9

Expert systems - Architecture of expert systems, Roles of expert systems - Knowledge Acquisition – Meta knowledge, Heuristics. Typical expert systems - MYCIN, DART, XOON, Expert systems shells.

TOTAL: 45 PERIODS

OUTCOMES: Employability

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

Identify problems that are amenable to solution by AI methods.
Identify appropriate AI methods to solve a given problem.
Formalise a given problem in the language/framework of different AI methods.
Implement basic AI algorithms.
Design and carry out an empirical evaluation of different algorithms on a problem formalisation, and state the conclusions that the evaluation supports.

TEXT BOOKS:

Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", McGraw Hill- 2008. (Unit-1,2,4,5).
Dan W. Patterson, "Introduction to AI and ES", Pearson Education, 2007. (Unit-III)

REFERENCES:

Peter Jackson, "Introduction to Expert Systems", 3rd Edition, Pearson Education, 2007.
Stuart Russel and Peter Norvig "AI – A Modern Approach", 2nd Edition, Pearson Education 2007.
Deepak Khemani "Artificial Intelligence", Tata Mc Graw Hill Education 2013.
http://nptel.ac.in/

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CS6660 COMPILER DESIGN L T P C 3 0 0 3

OBJECTIVES:

The student should be made to:

Learn the design principles of a Compiler.
Learn the various parsing techniques and different levels of translation.
Learn how to optimize and effectively generate machine codes.

UNIT I INTRODUCTION TO COMPILERS 5

Translators-Compilation and Interpretation-Language processors -The Phases of Compiler-Errors Encountered in Different Phases-The Grouping of Phases-Compiler Construction Tools - Programming Language basics.

UNIT II LEXICAL ANALYSIS 9

Need and Role of Lexical Analyzer-Lexical Errors-Expressing Tokens by Regular Expressions-Converting Regular Expression to DFA- Minimization of DFA-Language for Specifying Lexical Analyzers-LEX-Design of Lexical Analyzer for a sample Language.

UNIT III SYNTAX ANALYSIS 10

Need and Role of the Parser-Context Free Grammars -Top Down Parsing -General Strategies-Recursive Descent Parser Predictive Parser-LL(1) Parser-Shift Reduce Parser-LR Parser-LR (0)Item-Construction of SLR Parsing Table -Introduction to LALR Parser - Error Handling and Recovery in Syntax Analyzer-YACC-Design of a syntax Analyzer for a Sample Language .

UNIT IV SYNTAX DIRECTED TRANSLATION & RUN TIME ENVIRONMENT 12

Syntax directed Definitions-Construction of Syntax Tree-Bottom-up Evaluation of S-Attribute Definitions- Design of predictive translator - Type Systems-Specification of a simple type checker-Equivalence of Type Expressions-Type Conversions.

RUN-TIME ENVIRONMENT: Source Language Issues-Storage Organization-Storage Allocation-Parameter Passing-Symbol Tables-Dynamic Storage Allocation-Storage Allocation in FORTAN.

UNIT V CODE OPTIMIZATION AND CODE GENERATION 9

Principal Sources of Optimization-DAG- Optimization of Basic Blocks-Global Data Flow Analysis-Efficient Data Flow Algorithms-Issues in Design of a Code Generator - A Simple Code Generator Algorithm.

TOTAL: 45 PERIODS

OUTCOMES: Skill Development

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

Design and implement a prototype compiler.
Apply the various optimization techniques.
Use the different compiler construction tools.

TEXTBOOK:

Alfred V Aho, Monica S. Lam, Ravi Sethi and Jeffrey D Ullman, "Compilers – Principles, Techniques and Tools", 2nd Edition, Pearson Education, 2007.

REFERENCES:

Randy Allen, Ken Kennedy, "Optimizing Compilers for Modern Architectures: A Dependence-based Approach", Morgan Kaufmann Publishers, 2002.
Steven S. Muchnick, "Advanced Compiler Design and Implementation", Morgan Kaufmann Publishers - Elsevier Science, India, Indian Reprint 2003.
Keith D Cooper and Linda Torczon, "Engineering a Compiler", Morgan Kaufmann Publishers Elsevier Science, 2004.
4. Charles N. Fischer, Richard. J. LeBlanc, "Crafting a Compiler with C", Pearson Education, 2008.

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IT6602 SOFTWARE ARCHITECTURES L T P C 3 0 0 3

OBJECTIVES:

Understand software architectural requirements and drivers
Be exposed to architectural styles and views
Be familiar with architectures for emerging technologies

UNIT I INTRODUCTION AND ARCHITECTURAL DRIVERS 9

Introduction – What is software architecture? – Standard Definitions – Architectural structures – Influence of software architecture on organization-both business and technical – Architecture Business Cycle- Introduction – Functional requirements – Technical constraints – Quality Attributes.

UNIT II QUALITY ATTRIBUTE WORKSHOP 9

Quality Attribute Workshop – Documenting Quality Attributes – Six part scenarios – Case studies.

UNIT III ARCHITECTURAL VIEWS 9

Introduction – Standard Definitions for views – Structures and views - Representing views-available notations – Standard views – 4+1 view of RUP, Siemens 4 views, SEI's perspectives and views – Case studies

UNIT IVARCHITECTURAL STYLES 9

Introduction – Data flow styles – Call-return styles – Shared Information styles - Event styles – Case studies for each style.

UNIT VDOCUMENTING THE ARCHITECTURE 9

Good practices – Documenting the Views using UML – Merits and Demerits of using visual languages – Need for formal languages - Architectural Description Languages – ACME – Case studies. Special topics: SOA and Web services – Cloud Computing – Adaptive structures

OUTCOMES:

Upon Completion of the course, the students will be able to

Explain influence of software architecture on business and technical activities Employability
Identify key architectural structures
Use styles and views to specify architecture Entrepreneurship
Design document for a given architecture

TEXT BOOKS:

Len Bass, Paul Clements, and Rick Kazman, "Software Architectures Principles and Practices", 2nd Edition, Addison-Wesley, 2003.

Anthony J Lattanze, "Architecting Software Intensive System. A Practitioner's Guide", Auerbach Publications, 2010.

REFERENCES:

Paul Clements, Felix Bachmann, Len Bass, David Garlan, James Ivers, Reed Little, Paulo Merson, Robert Nord, and Judith Stafford, "Documenting Software Architectures. Views and Beyond", 2nd Edition, Addison-Wesley, 2010.

Paul Clements, Rick Kazman, and Mark Klein, "Evaluating software architectures: Methods and case studies. Addison-Wesley, 2001.

Rajkumar Buyya, James Broberg, and Andrzej Goscinski, "Cloud Computing. Principles and Paradigms", John Wiley & Sons, 2011

Mark Hansen, "SOA Using Java Web Services", Prentice Hall, 2007

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GE6757 **TOTAL QUALITY MANAGEMENT** L T P C
3 0 0 3

OBJECTIVES :

To facilitate the understanding of Quality Management principles and process.

UNIT I INTRODUCTION 9

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality.

UNIT II TQM PRINCIPLES 9

Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

UNIT III TQM TOOLS AND TECHNIQUES I 9

The seven traditional tools of quality - New management tools - Six sigma: Concepts, Methodology, applications to manufacturing, service sector including IT - Bench marking - Reason to bench mark, Bench marking process - FMEA - Stages, Types.

UNIT IVTQM TOOLS AND TECHNIQUES II 9

Control Charts - Process Capability - Concepts of Six Sigma - Quality Function Development (QFD) - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures.

UNIT V QUALITY SYSTEMS 9

Need for ISO 9000 - ISO 9001-2008 Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors..

TOTAL: 45 PERIODS

OUTCOMES: Skill Development, Employability Entrepreneurship

The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

TEXTBOOK:

Dale H. Besterfiled, et at., "Total quality Management", Pearson Education Asia, Third Edition, Indian Reprint 2006.

REFERENCES:

James R. Evans and William M. Lindsay, "The Management and Control of Quality", 8th Edition, First Indian Edition, Cengage Learning, 2012.
Suganthi.L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd., 2006.
Janakiraman. B and Gopal .R.K., "Total Quality Management - Text and Cases", Prentice Hall (India) Pvt. Ltd., 2006.

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L T P C

David Garlan, Bradley Schmerl, and Shang-Wen Cheng, "Software Architecture-Based Self-Adaptation," 31-56. Mieso K Denko, Laurence Tianruo Yang, and Yan Zang (eds.), "Autonomic Computing and Networking". Springer Verlag, 2009

IT6611	MOBILE APPLICATION DEVELOPMENT LABORATORY	L T P C 0 0 3 2

OBJECTIVES:

The student should be made to:

Know the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
Understand how to work with various mobile application development frameworks.
Learn the basic and important design concepts and issues of development of mobile applications.
Understand the capabilities and limitations of mobile devices.

LIST OF EXPERIMENTS

Develop an application that uses GUI components, Font and Colours
Develop an application that uses Layout Managers and event listeners.
Develop a native calculator application.
Write an application that draws basic graphical primitives on the screen.
Develop an application that makes use of database.
Develop an application that makes use of RSS Feed.
Implement an application that implements Multi threading
Develop a native application that uses GPS location information.
Implement an application that writes data to the SD card.
Implement an application that creates an alert upon receiving a message.
Write a mobile application that creates alarm clock

TOTAL: 45 PERIODS

OUTCOMES: Skill Development, Employability, Entrepreneurship

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

Design and Implement various mobile applications using emulators.
Deploy applications to hand-held devices

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS

Standalone desktops with Windows or Android or iOS or Equivalent Mobile Application Development Tools with appropriate emulators and debuggers - 30 Nos.

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IT6612	COMPILER LABORATORY	L T P C 0 0 3 2

OBJECTIVES:

The student should be made to:

Be exposed to compiler writing tools.
Learn to implement the different Phases of compiler
Be familiar with control flow and data flow analysis
Learn simple optimization techniques

LIST OF EXPERIMENTS:

Implementation of Symbol Table
Develop a lexical analyzer to recognize a few patterns in
C. (Ex. identifiers, constants, comments, operators etc.)
Implementation of Lexical Analyzer using Lex Tool
Generate YACC specification for a few syntactic categories.
Program to recognize a valid arithmetic expression that usesoperator +, - , * and /.
Program to recognize a valid variable which starts with a letterfollowed by
any number of letters or digits.
d)Implementation of Calculator using LEX and YACC
Convert the BNF rules into Yacc form and write code to generate Abstract Syntax Tree.
Implement type checking
Implement control flow analysis and Data flow Analysis
Implement any one storage allocation strategies(Heap,Stack,Static)
Construction of DAG
Implement the back end of the compiler which takes the three address code and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.
Implementation of Simple Code Optimization Techniques (Constant Folding., etc.)

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to

Implement the different Phases of compiler using tools
Analyze the control flow and data flow of a typical program
Optimize a given program
Generate an assembly language program equivalent to a source language program

Skill Development
Employability

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

Standalone desktops with C / C++ compiler and Compiler writing tools 30 Nos.
(or)
Server with C / C++ compiler and Compiler writing tools supporting 30 terminals or more. LEX and YACC

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GE6674 COMMUNICATION AND SOFT SKILLS - LABORATORY BASED **L T P C 0 0 4 2**

OBJECTIVES:

To enable learners to develop their communicative competence.
To facilitate them to hone their soft skills.
To equip them with employability skills to enhance their prospect of placements.

UNIT I LISTENING AND SPEAKING SKILLS **12**

Conversational skills (formal and informal) – group discussion and interview skills – making presentations.
Listening to lectures, discussions, talk shows, news programmes, dialogues from TV/radio/Ted talk/Podcast – watching videos on interesting events on You tube.

UNIT II READING AND WRITING SKILLS 12

Reading different genres of tests ranging from newspapers to philosophical treatises – reading strategies such as graphic organizers, summarizing and interpretation.

Writing job applications – cover letter – resume – emails – letters – memos – reports – blogs – writing for publications.

UNIT III ENGLISH FOR NATIONAL AND INTERNATIONAL EXAMINATIONS AND PLACEMENTS 12 International English Language Testing System (IELTS) – Test of English as a Foreign Language (TOEFL) – Graduate Record Examination (GRE) – Civil Service (Language related) – Verbal ability.

UNIT IV SOFT SKILLS (1) 12

Motivation – self image – goal setting – managing changes – time management – stress management – leadership traits – team work – career and life planning.

UNIT V SOFT SKILLS (2) 12

Multiple intelligences – emotional intelligence – spiritual quotient (ethics) – intercultural communication – creative and critical thinking – learning styles and strategies.

TOTAL: 60 PERIODS

TEACHING METHODS:

1. To be totally learner-centric with minimum teacher intervention as the course revolves around practice.
   Suitable audio/video samples from Podcast/YouTube to be used for illustrative purposes.
   Portfolio approach for writing to be followed. Learners are to be encouraged to blog, tweet, text and email employing appropriate language.
   GD/Interview/Role Play/Debate could be conducted off the laboratory (in a regular classroom) but learners are to be exposed to telephonic interview and video conferencing.
   Learners are to be assigned to read/write/listen/view materials outside the classroom as well for graining proficiency and better participation in the class.

LAB INFRASTRUCTURE:

S. No.	Description of Equipment (minimum configuration)	Qty Required
1	**Server**	1 No.
	• PIV System	
	• 1 GB RAM / 40 GB HDD	
	• OS: Win 2000 server	
	• Audio card with headphones	
	• JRE 1.3	
2	**Client Systems**	60 Nos.
	• PIII System	
	• 256 or 512 MB RAM / 40 GB HDD	
	• OS: Win 2000	
	• Audio card with headphones	
	• JRE 1.3	
3	Handicam	1 No.
4	Television 46"	1 No.
5	Collar mike	1 No.
6	Cordless mike	1 No.
7	Audio Mixer	1 No.
8	DVD recorder/player	1 No.
9	LCD Projector with MP3/CD/DVD provision for Audio/video facility	1 No.

EVALUATION:

INTERNAL: 20 MARKS

Record maintenance: Students should write a report on a regular basis on the activities conducted, focusing on the details such as the description of the activity, ideas emerged, learning outcomes and so on. At the end of the semester records can be evaluated out of 20 marks.

EXTERNAL: 80 MARKS

Online Test	- 35 marks
Interview	- 15 marks
Presentation	- 15 marks
Group Discussion	- 15 marks

NOTE ON INTERNAL AND EXTERNAL EVALUATION:

Interview – mock interview can be conducted on one-on-one basis.

Speaking – example for role play:

Marketing engineer convincing a customer to buy his product.

Telephonic conversation- fixing an official appointment / placing an order / enquiring and so on.

Presentation – should be extempore on simple topics.

Discussion – topics of different kinds; general topics, case studies and abstract concept.

OUTCOMES: Skill Development

At the end of the course, learners should be able to

Take international examination such as IELTS and TOEFL

Make presentations and Participate in Group Discussions.

Successfully answer questions in interviews.

REFERENCES:

Business English Certificate Materials, Cambridge University Press.

Graded Examinations in Spoken English and Spoken English for Work downloadable materials from Trinity College, London.

International English Language Testing System Practice Tests, Cambridge University Press.

Interactive Multimedia Programs on Managing Time and Stress.

Personality Development (CD-ROM), Times Multimedia, Mumbai.

Robert M Sherfield and et al. "Developing Soft Skills" 4th edition, New Delhi: Pearson Education, 2009.

WEB SOURCES:

http://www.slideshare.net/rohitjsh/presentation-on-group-discussion
http://www.washington.edu/doit/TeamN/present_tips.html
http://www.oxforddictionaries.com/words/writing-job-applications
http://www.kent.ac.uk/careers/cv/coveringletters.htm
http://www.mindtools.com/pages/article/newCDV_34.htm

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IT6701 INFORMATION MANAGEMENT L T P C
3 0 0 3

OBJECTIVES:

To expose students with the basics of managing the information
To explore the various aspects of database design and modelling,
To examine the basic issues in information governance and information integration
To understand the overview of information architecture.

UNIT I DATABASE MODELLING, MANAGEMENT AND DEVELOPMENT 9

Database design and modelling - Business Rules and Relationship; Java database Connectivity (JDBC), Database connection Manager, Stored Procedures. Trends in Big Data systems including NoSQL - Hadoop HDFS, MapReduce, Hive, and enhancements.

UNIT II DATA SECURITY AND PRIVACY 9

Program Security, Malicious code and controls against threats; OS level protection; Security – Firewalls, Network Security Intrusion detection systems. Data Privacy principles. Data Privacy Laws and compliance.

UNIT III INFORMATION GOVERNANCE 9

Master Data Management (MDM) – Overview, Need for MDM, Privacy, regulatory requirements and compliance. Data Governance – Synchronization and data quality management.

UNIT IVINFORMATION ARCHITECTURE 9

Principles of Information architecture and framework, Organizing information, Navigation systems and Labelling systems, Conceptual design, Granularity of Content.

UNIT V INFORMATION LIFECYCLE MANAGEMENT 9

Data retention policies; Confidential and Sensitive data handling, lifecycle management costs. Archive data using Hadoop; Testing and delivering big data applications for performance and functionality; Challenges with data administration;

TOTAL: 45 PERIODS

OUTCOMES: Employability

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

Cover core relational database topics including logical and physical design and modeling
Design and implement a complex information system that meets regulatory requirements; define and manage an organization's key master data entities
Design, Create and maintain data warehouses.
Learn recent advances in NOSQL , Big Data and related tools.

TEXT BOOKS:

Alex Berson, Larry Dubov MASTER DATA MANAGEMENT AND DATA GOVERNANCE, 2/E, Tata McGraw Hill, 2011

Security in Computing, 4/E, Charles P. Pfleeger, Shari Lawrence Pfleeger, Prentice Hall; 2006

Information Architecture for the World Wide Web; Peter Morville, Louis Rosenfeld ; O'Reilly Media; 1998

REFERENCES:

Jeffrey A. Hoffer, Heikki Topi, V Ramesh - MODERN DATABASE MANAGEMENT, 10 Edition, PEARSON, 2012

http://nosql-database.org/ Next Gen databases that are distributed, open source and scalable.

http://ibm.com/big-data - Four dimensions of big data and other ebooks on Big Data Analytics

Inside Cyber Warfare: Mapping the Cyber Underworld- Jeffrey Carr, O'Reilly Media; Second Edition 2011

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CS6701 CRYPTOGRAPHY AND NETWORK SECURITY L T P C 3 0 0 3

OBJECTIVES:

The student should be made to:

Understand OSI security architecture and classical encryption techniques.
Acquire fundamental knowledge on the concepts of finite fields and number theory.
Understand various block cipher and stream cipher models.
Describe the principles of public key cryptosystems, hash functions and digital signature.

UNIT I INTRODUCTION & NUMBER THEORY **10**

Services, Mechanisms and attacks-the OSI security architecture-Network security model-Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques, steganography).FINITE FIELDS AND NUMBER THEORY: Groups, Rings, Fields-Modular arithmetic-Euclid"s algorithm-Finite fields- Polynomial Arithmetic –Prime numbers-Fermat"s and Euler"s theorem-Testing for primality -The Chinese remainder theorem- Discrete logarithms.

UNIT II BLOCK CIPHERS & PUBLIC KEY CRYPTOGRAPHY **10**

Data Encryption Standard-Block cipher principles-block cipher modes of operation-Advanced Encryption Standard (AES)-Triple DES-Blowfish-RC5 algorithm. **Public key cryptography:** Principles of public key cryptosystems-The RSA algorithm-Key management - Diffie Hellman Key exchange-Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT IIIHASH FUNCTIONS AND DIGITAL SIGNATURES **8**

Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC –MD5 - SHA - HMAC – CMAC - Digital signature and authentication protocols – DSS – El Gamal – Schnorr.

UNIT IVSECURITY PRACTICE & SYSTEM SECURITY **8**

Authentication applications – Kerberos – X.509 Authentication services - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions. Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security.

UNIT VE-MAIL, IP & WEB SECURITY **9**

E-mail Security: Security Services for E-mail-attacks possible through E-mail - establishing keys privacy-authentication of the source-Message Integrity-Non-repudiation-Pretty Good Privacy-S/MIME. **IPSecurity:** Overview of IPSec - IP and IPv6-Authentication Header-Encapsulation Security Payload (ESP)-Internet Key Exchange (Phases of IKE, ISAKMP/IKE Encoding). **Web Security:** SSL/TLS Basic Protocol-computing the keys- client authentication-PKI as deployed by SSLAttacks fixed in v3-Exportability-Encoding-Secure Electronic Transaction (SET).

TOTAL: 45 PERIODS

OUTCOMES: Employability

Upon Completion of the course, the students should be able to:

Compare various Cryptographic Techniques
Design Secure applications
Inject secure coding in the developed applications

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TEXT BOOKS:

William Stallings, Cryptography and Network Security, 6th Edition, Pearson Education, March 2013. (UNIT I,II,III,IV).

Charlie Kaufman, Radia Perlman and Mike Speciner, "Network Security", Prentice Hall of India, 2002. (UNIT V).

REFERENCES:

Behrouz A. Ferouzan, "Cryptography & Network Security", Tata Mc Graw Hill, 2007.

Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003.

Charles Pfleeger, "Security in Computing", 4th Edition, Prentice Hall of India, 2006.

Ulysess Black, "Internet Security Protocols", Pearson Education Asia, 2000.

Charlie Kaufman and Radia Perlman, Mike Speciner, "Network Security, Second Edition, Private Communication in Public World", PHI 2002.

Bruce Schneier and Neils Ferguson, "Practical Cryptography", First Edition, Wiley Dreamtech India Pvt Ltd, 2003.

Douglas R Simson "Cryptography – Theory and practice", First Edition, CRC Press, 1995.

http://nptel.ac.in/.

IT6702	DATA WAREHOUSING AND DATA MINING	L T P C 3 0 0 3

OBJECTIVES:

The student should be made to:

Be familiar with the concepts of data warehouse and data mining,

Be acquainted with the tools and techniques used for Knowledge Discovery in Databases.

UNIT I DATA WAREHOUSING 9

Data warehousing Components –Building a Data warehouse – Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata.

UNIT II BUSINESS ANALYSIS 9

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools – OLAP Tools and the Internet.

UNIT III DATA MINING 9

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing.

UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION 9

Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction.

UNIT V CLUSTERING AND TRENDS IN DATA MINING 9

Cluster Analysis - Types of Data – Categorization of Major Clustering Methods – K-means– Partitioning Methods – Hierarchical Methods - Density-Based Methods –Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

TOTAL: 45 PERIODS

OUTCOMES: Employability

After completing this course, the student will be able to:

Apply data mining techniques and methods to large data sets.
Use data mining tools.
Compare and contrast the various classifiers.

TEXT BOOKS:

Alex Berson and Stephen J.Smith, "Data Warehousing, Data Mining and OLAP", Tata McGraw – Hill Edition, Thirteenth Reprint 2008.
Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Third Edition, Elsevier, 2012.

REFERENCES:

Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Person Education, 2007.
K.P. Soman, Shyam Diwakar and V. Aja, "Insight into Data Mining Theory and Practice", Eastern Economy Edition, Prentice Hall of India, 2006.
G. K. Gupta, "Introduction to Data Mining with Case Studies", Eastern Economy Edition, Prentice Hall of India, 2006.
Daniel T.Larose, "Data Mining Methods and Models", Wiley-Interscience, 2006.

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CS6703 GRID AND CLOUD COMPUTING **L T P C 3 0 0 3**

OBJECTIVES:

The student should be made to:

Understand how Grid computing helps in solving large scale scientific problems.
Gain knowledge on the concept of virtualization that is fundamental to cloud computing.
Learn how to program the grid and the cloud.
Understand the security issues in the grid and the cloud environment.

UNIT I INTRODUCTION 9

Evolution of Distributed computing: Scalable computing over the Internet – Technologies for network based systems – clusters of cooperative computers - Grid computing Infrastructures – cloud computing - service oriented architecture – Introduction to Grid Architecture and standards – Elements of Grid – Overview of Grid Architecture.

UNIT II GRID SERVICES 9

Introduction to Open Grid Services Architecture (OGSA) – Motivation – Functionality Requirements – Practical & Detailed view of OGSA/OGSI – Data intensive grid service models – OGSA services.

UNIT III VIRTUALIZATION 9

Cloud deployment models: public, private, hybrid, community – Categories of cloud computing: Everything as a service: Infrastructure, platform, software - Pros and Cons of cloud computing – Implementation levels of virtualization – virtualization structure – virtualization of CPU, Memory and I/O devices – virtual clusters and Resource Management – Virtualization for data center automation.

UNIT IV PROGRAMMING MODEL 9

Open source grid middleware packages – Globus Toolkit (GT4) Architecture , Configuration – Usage of Globus – Main components and Programming model - Introduction to Hadoop Framework - Mapreduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job – Design of Hadoop file system, HDFS concepts, command line and java interface, dataflow of File read & File write.

UNIT V SECURITY 9

Trust models for Grid security environment – Authentication and Authorization methods – Grid security infrastructure – Cloud Infrastructure security: network, host and application level – aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.

TOTAL: 45 PERIODS

OUTCOMES: Entrepreneurship

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

Apply grid computing techniques to solve large scale scientific problems
Apply the concept of virtualization
Use the grid and cloud tool kits
Apply the security models in the grid and the cloud environment

TEXT BOOK:

Kai Hwang, Geoffery C. Fox and Jack J. Dongarra, "Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet", First Edition, Morgan Kaufman Publisher, an Imprint of Elsevier, 2012.

REFERENCES:

Jason Venner, "Pro Hadoop- Build Scalable, Distributed Applications in the Cloud", A Press, 2009
Tom White, "Hadoop The Definitive Guide", First Edition. O'Reilly, 2009.
Bart Jacob (Editor), "Introduction to Grid Computing", IBM Red Books, Vervante, 2005
Ian Foster, Carl Kesselman, "The Grid: Blueprint for a New Computing Infrastructure", 2nd Edition, Morgan Kaufmann.
Frederic Magoules and Jie Pan, "Introduction to Grid Computing" CRC Press, 2009.
Daniel Minoli, "A Networking Approach to Grid Computing", John Wiley Publication, 2005.
Barry Wilkinson, "Grid Computing: Techniques and Applications", Chapman and Hall, CRC, Taylor and Francis Group, 2010.

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IT6004 SOFTWARE TESTING L T P C 3 0 0 3

OBJECTIVES:

The student should be made to:

Expose the criteria for test cases.
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 Bod 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 AMANAGEMENT 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

OUTCOMES: Employability

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

Design test cases suitable for a software development for different domains.
Identify suitable tests to be carried out.
Prepare test planning based on the document.
Document test plans and test cases designed.
Use of automatic testing tools.
Develop and validate a test plan.

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IT6711 DATA MINING LABORATORY L T P C
0 0 3 2

OBJECTIVES:

The student should be made to:

Be familiar with the algorithms of data mining.
Be acquainted with the tools and techniques used for Knowledge Discovery in Databases.
Be exposed to web mining and text mining

LIST OF EXPERIMENTS:

Creation of a Data Warehouse.
Apriori Algorithm.
FP-Growth Algorithm.
K-means clustering.
One Hierarchical clustering algorithm.
Bayesian Classification.
Decision Tree.
Support Vector Machines.
Applications of classification for web mining.
Case Study on Text Mining or any commercial application.

TOTAL : 45 PERIODS

OUTCOMES:

After completing this course, the student will be able to:

Apply data mining techniques and methods to large data sets.
Use data mining tools. Skill Development
Compare and contrast the various classifiers. Employability

LAB EQUIPMENT FOR A BATCH OF 30 STUDENTS:

SOFTWARE:

WEKA, RapidMiner, DB Miner or Equivalent

HARDWARE

Standalone desktops 30 Nos

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IT6712 SECURITY LABORATORY L T P C
0 0 3 2

OBJECTIVES:

The student should be made to:

Be exposed to the different cipher techniques
Learn to implement the algorithms DES, RSA,MD5,SHA-1
Learn to use tools like GnuPG, KF sensor, Net Strumbler

LIST OF EXPERIMENTS

Implement the following SUBSTITUTION & TRANSPOSITION TECHNIQUES concepts:

Caesar Cipher
Playfair Cipher
Hill Cipher
Vigenere Cipher
Rail fence – row & Column Transformation

Implement the following algorithms
- DES
- RSA Algorithm
- Diffiee-Hellman
- MD5
- SHA-1

3 Implement the SIGNATURE SCHEME - Digital Signature Standard

Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG).

Setup a honey pot and monitor the honeypot on network (KF Sensor)

Installation of rootkits and study about the variety of options

Perform wireless audit on an access point or a router and decrypt WEP and WPA.(Net Stumbler)

Demonstrate intrusion detection system (ids) using any tool (snort or any other s/w)

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to

Implement the cipher techniques
Develop the various security algorithms Skill Development
Use different open source tools for network security and analysis Employability

LAB EQUIPMENTS FOR A BATCH OF 30 STUDENTS:

SOFTWARE:

C / C++ / Java or equivalent compiler

GnuPG, KF Sensor or Equivalent, Snort, Net Stumbler or Equivalent

HARDWARE:

Standalone desktops -30 Nos.
(or)
Server supporting 30 terminals or more.

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IT6713 **GRID AND CLOUD COMPUTING LABORATORY** **L T P C 0 0 3 2**

OBJECTIVES:

The student should be made to:

Be exposed to tool kits for grid and cloud environment.
Be familiar with developing web services/Applications in grid framework
Learn to run virtual machines of different configuration.
Learn to use Hadoop

LIST OF EXPERIMENTS:

GRID COMPUTING LAB:

Use Globus Toolkit or equivalent and do the following:
- Develop a new Web Service for Calculator.
- Develop new OGSA-compliant Web Service.
- Using Apache Axis develop a Grid Service.

Develop applications using Java or C/C++ Grid APIs
Develop secured applications using basic security mechanisms available in Globus Toolkit.
Develop a Grid portal, where user can submit a job and get the result. Implement it with and without GRAM concept.

CLOUD COMPUTING LAB:

Use Eucalyptus or Open Nebula or equivalent to set up the cloud and demonstrate.
Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time.
Find procedure to attach virtual block to the virtual machine and check whether it holds the data even after the release of the virtual machine.
Install a C compiler in the virtual machine and execute a sample program.
Show the virtual machine migration based on the certain condition from one node to the other.
Find procedure to install storage controller and interact with it.
Find procedure to set up the one node Hadoop cluster.
Mount the one node Hadoop cluster using FUSE.
Write a program to use the API's of Hadoop to interact with it.
Write a word count program to demonstrate the use of Map and Reduce tasks.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to

Use the grid and cloud tool kits. Skill Development
Design and implement applications on the Grid.
Design and Implement applications on the Cloud. Employability

LAB EQUIPMENT FOR A BATCH OF 30 STUDENTS:

SOFTWARE:

Globus Toolkit or equivalent
Eucalyptus or Open Nebula or equivalent to

HARDWARE

Standalone desktops 30 Nos

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IT6801 **SERVICE ORIENTED ARCHITECTURE** **L T P C 3 0 0 3**

OBJECTIVES:

The student should be made to:

Learn XML fundamentals.
Be exposed to build applications based on XML.
Understand the key principles behind SOA.
Be familiar with the web services technology elements for realizing SOA.
Learn the various web service standards.

UNIT I **INTRODUCTION TO XML** **9**

XML document structure – Well formed and valid documents – Namespaces – DTD – XML Schema – X-Files.

UNIT II BUILDING XML- BASED APPLICATIONS 9

Parsing XML – using DOM, SAX – XML Transformation and XSL – XSL Formatting – Modeling Databases in XML.

UNIT III SERVICE ORIENTED ARCHITECTURE 9

Characteristics of SOA, Comparing SOA with Client-Server and Distributed architectures – Benefits of SOA -- Principles of Service orientation – Service layers.

UNIT IV WEB SERVICES 9

Service descriptions – WSDL – Messaging with SOAP – Service discovery – UDDI – Message Exchange Patterns – Orchestration – Choreography –WS Transactions.

UNIT VBUILDING SOA-BASED APPLICATIONS 9

Service Oriented Analysis and Design – Service Modeling – Design standards and guidelines -- Composition – WS-BPEL – WS-Coordination – WS-Policy – WS-Security – SOA support in J2EE.

TOTAL: 45 PERIODS

OUTCOMES: Employability

Upon successful completion of this course, students will be able to:

Build applications based on XML.
Develop web services using technology elements.
Build SOA-based applications for intra-enterprise and inter-enterprise applications.

TEXTBOOKS:

Ron Schmelzer et al. " XML and Web Services", Pearson Education, 2002
Thomas Erl, "Service Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2005.

REFERENCES:

Frank P.Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2002.
2. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Pearson Education, 2005.
Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect's Guide", Prentice Hall, 20044.
James McGovern,Sameer Tyagi, Michael E.Stevens, Sunil Mathew, "Java Web Services Architecture", Morgan Kaufmann Publishers, 2003

IT6811 PROJECT WORK L T P C 0 0 12 6

OBJECTIVES:

To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination.

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 180 PERIODS

GE6075

PROFESSIONAL ETHICS IN ENGINEERING

L T P C
3 0 0 3

OBJECTIVES:

To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

UNIT I HUMAN VALUES 10

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

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.

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS 9

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination

UNIT V GLOBAL ISSUES 8

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Code of Conduct – Corporate Social Responsibility

TOTAL: 45 PERIODS

OUTCOMES: Skill Development

Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society

TEXTBOOKS:

1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

REFERENCES:

1. Charles B. Fledderman, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics – Concepts and Cases", Cengage Learning, 2009
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003
4. Edmund G Seebauer and Robert L Barry, "Fundametals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001
5. Laura P. Hartman and Joe Desjardins, "Business Ethics: Decision Making for Personal Integrity and Social Responsibility" Mc Graw Hill education, India Pvt. Ltd.,New Delhi 2013.\
6. World Community Service Centre, „ Value Education", Vethathiri publications, Erode, 2011

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CS6004 **CYBER FORENSICS** L T P C
3 0 0 3

OBJECTIVES:

The student should be made to:

Learn the security issues network layer and transport layer.
Be exposed to security issues of the application layer.
Learn computer forensics.
Be familiar with forensics tools.
Learn to analyze and validate forensics data.

UNIT I NETWORK LAYER SECURITY &TRANSPORT LAYER SECURITY 9

IPSec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPSec.Transport layer Security: SSL protocol, Cryptographic Computations – TLS Protocol.

UNIT II E-MAIL SECURITY & FIREWALLS 9

PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions.

UNIT III INTRODUCTION TO COMPUTER FORENSICS 9

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

UNIT IV EVIDENCE COLLECTION AND FORENSICS TOOLS 9

Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools.

UNIT V ANALYSIS AND VALIDATION 9

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics.

TOTAL: 45 PERIODS

OUTCOMES: Employability

Upon completion of the course, the student should be able to:

Discuss the security issues network layer and transport layer.
Apply security principles in the application layer.
Explain computer forensics.
Use forensics tools.
Analyze and validate forensics data.

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TEXT BOOKS:

Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003.
Nelson, Phillips, Enfinger, Steuart, "Computer Forensics and Investigations", Cengage Learning, India Edition, 2008.

REFERENCES:

John R.Vacca, "Computer Forensics", Cengage Learning, 2005
Richard E.Smith, "Internet Cryptography", 3rd Edition Pearson Education, 2008.
Marjie T.Britz, "Computer Forensics and Cyber Crime": An Introduction", 3rd Edition, Prentice Hall, 2013.

MG6088	SOFTWARE PROJECT MANAGEMENT	L T P C 3 0 0 3

OBJECTIVES:

To outline the need for Software Project Management
To highlight different techniques for software cost estimation and activity planning.

UNIT I PROJECT EVALUATION AND PROJECT PLANNING 9

Importance of Software Project Management – Activities Methodologies – Categorization of Software Projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning.

UNIT II PROJECT LIFE CYCLE AND EFFORT ESTIMATION 9

Software process and Process Models – Choice of Process models - mental delivery – Rapid Application development – Agile methods – Extreme Programming – SCRUM – Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points - COCOMO II A Parametric Productivity Model - Staffing Pattern.

UNIT IIIACTIVITY PLANNING AND RISK MANAGEMENT 9

Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Monitoring – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical patterns – Cost schedules.

UNIT IV PROJECT MANAGEMENT AND CONTROL 9

Framework for Management and control – Collection of data Project termination – Visualizing progress – Cost monitoring – Earned Value Analysis- Project tracking – Change control- Software Configuration Management – Managing contracts – Contract Management.

UNIT VSTAFFING 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.

TOTAL: 45 PERIODS

OUTCOMES: Entrepreneurship

At the end of the course the students will be able to practice Project Management principles while developing a software.

TEXTBOOK:

Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.

REFERENCES:

Robert K. Wysocki "Effective Software Project Management" – Wiley Publication,2011.
Walker Royce: "Software Project Management"- Addison-Wesley, 1998.
Gopalaswamy Ramesh, "Managing Global Software Projects" – McGraw Hill Education (India), Fourteenth Reprint 2013.

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