B.TECH. COMPUTER SCIENCE AND ENGINEERING

Curriculum &Syllabus [Regulation B (2013)]

SEMESTER I

Course Code	Course Name	L	T	P	C
THEORY					
U1GEB01	Communicative English - I	3	0	0	3
U1GEB02	Engineering Mathematics - I	3	1	0	4
U1GEB03	Engineering Physics - I	3	0	0	3
U1GEB04	Engineering Chemistry - I	3	0	0	3
U1GEB05	Basic Electrical and Electronics Engineering	3	0	0	3
U1GEB06	Engineering Graphics	3	1	0	4
PRACTICAL					
U1GEB07	Engineering Physics and Chemistry Laboratory - I	0	0	4	2
U1GEB08	Basic Electrical and Electronics Laboratory	0	0	3	2
U1GEB09	Engineering Practices laboratory	0	0	3	2
Total		18	2	10	26

SEMESTER II

Course Code	Course Name	L	T	P	C
THEORY					
U2GEB10	Communicative English-II	3	0	0	3
U2GEB11	Engineering Mathematics –II	3	1	0	4
U2GEB12	Engineering Physics – II	3	0	0	3
U2GEB13	Engineering Chemistry – II	3	0	0	3
U2GEB14	Fundamentals of Computing and Programming	3	0	0	3
U2GEB15	Basics of Mechanical and Civil Engineering	3	0	0	3
PRACTICAL					
U2GEB16	Computer Practice Laboratory	0	0	3	2
U2GEB17	Engineering Physics & Chemistry Laboratory-II	0	0	4	2
U2GEB18	Communication Skills Laboratory	0	0	3	2
Total		18	1	10	25

B.TECH. COMPUTER SCIENCE AND ENGINEERING
Curriculum &Syllabus [Regulation B (for Batch 2014-15 only)]
SEMESTER I

Course Code	Course Name	L	T	P	C
THEORY					
U1GEB20	Engineering English - I	2	0	0	2
U1GEB21	Engineering Mathematics - I	3	1	0	4
U1GEB22	Engineering Physics - I	2	0	0	2
U1GEB23	Engineering Chemistry - I	2	0	0	2
U1GEB24	Principles of Electrical and Electronics Engineering	3	0	0	3
U1GEB25	Basics of Computing and C Programming	3	0	0	3
PRACTICAL					
U1GEB26	Engineering Physics and Chemistry Laboratory - I	0	0	4	2
U1GEB27	Principles of Electrical and Electronics Engineering Laboratory	0	0	3	2
U1GEB28	Computer Practices laboratory	0	0	3	2
Total		15	1	10	22

SEMESTER II

Course Code	Course Name	L	T	P	C
THEORY					
U2GEB29	Engineering English-II	2	0	0	2
U2GEB30	Engineering Mathematics –II	3	1	0	4
U2GEB31	Engineering Physics – II	2	0	0	2
U2GEB32	Engineering Chemistry – II	2	0	0	2
U2GEB33	Basics of Mechanical and Civil Engineering	3	0	0	3
U2GEB34	Engineering Graphics	3	1	0	4
PRACTICAL					
U2GEB37	Engineering Practice Lab	0	0	3	2
U2GEB35	Engineering Physics & Chemistry Laboratory-II	0	0	4	2
U2GEB36	Proficiency in English Lab - I	0	0	3	2
U2GEB38	Life Skills	1	0	0	1
Total		16	2	10	24

SEMESTER III

SUB.CODE	SUBJECTS	L	T	P	C
THEORY					
U3MAB01	Transforms And Partial Differential Equations	3	1	0	4
U3CSB01	Data Structures & Algorithms	3	0	0	3
U3CSB02	Digital Principles and system design	3	1	0	4
U3ITB18	Java Programming	3	0	0	3
U3CSB03	System Software	3	0	0	3
U3CSB04	Computer Organization and Architecture	3	0	0	3
PRACTICAL					
U3CSB05	Data Structures Lab	1	0	3	2
U3CSB06	Digital Lab	0	0	3	2
U3ITB01	J2SE – Core JAVA	0	0	3	2
Total Credits					26

SEMESTER IV

SUB.CODE	SUBJECTS	L	T	P	C
THEORY					
U4MAB05	Probability and Queuing Theory	3	1	0	4
U4CSB07	Design and Analysis of Algorithms	3	1	0	4
U4CSB08	Theory of Computation	3	0	0	3
U4ECB14	Microprocessors & Microcontrollers	3	0	0	3
U4CSB09	Database management System	3	0	0	3
U4CSB10	Operating System	3	0	0	3
PRACTICAL					
U4CSB11	Operating System Lab	0	0	3	2
U4ECB17	Microprocessors and Microcontrollers Lab	0	0	3	2
U4CSB12	Database Management System Lab	0	0	3	2
Total Credits					25

L – Lecture; T – Tutorial; P – Practical; C – Credit

SEMESTER V

Code No	Subjects	L	T	P	C
Theory					
U5MAB07	Discrete Mathematics	3	1	0	4
U5CSB13	Compiler Design	3	1	0	4
U5CSB14	Software Engineering & Project Management	3	0	0	3
U5CSB15	Data Communication and Computer Networks	3	0	0	3
U5CEB13	Environmental Science and Engineering	3	0	0	3
*****	Departmental Elective - I	3	0	0	3
Practical					
U5CSB17	Networks lab	0	0	3	2
U5CSB18	Compiler Design Lab	0	0	3	2
U5CSB19	Windows Programming Lab	1	0	3	2
Total Credits					27

SEMESTER VI

Code No	Subjects	L	T	P	C
Theory					
U6MAB03	Numerical Methods	3	1	0	4
U6CSB20	C# and .NET	3	0	0	3
U6CSB21	Object Oriented Analysis and Design	3	0	0	3
U6CSB22	Enterprise java and Web services	3	0	0	3
*****	Departmental Elective - II	3	0	0	3
*****	Open Elective –I	3	0	0	3
Practical					
U6ITB02	Case Tools Lab	0	0	3	2
U6CSB23	Web services Lab	0	0	3	2
U6CSB24	C# and .NET Lab	0	0	3	2
Total Credits					25

L – Lecture; T – Tutorial; P – Practical; C – Credit

SEMESTER VII

Code No	Subjects	L	T	P	C
Theory					
U7CSB25	Data warehousing and mining	3	0	0	3
U7CSB26	Mobile Communication and Computing	3	0	0	3
U7CSB27	Information Storage Management	3	0	0	3
U7CSB28	Cryptography and Network Security	3	0	0	3
*****	Departmental Elective - III	3	0	0	3
*****	Open Elective – II	3	0	0	3
Practical					
U7CSB29	ASP.NET Lab	1	0	3	3
U7CSB30	Business Communication Lab	0	0	3	2
U7CSB31	Mini Project	0	0	3	2
Total Credits					25

SEMESTER VIII

SUB.CODE	SUBJECTS	L	T	P	C
U8CSB32	Project Work	0	0	24	12
Total Credits					12

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

Total Credits = 140

DEPARTMENTAL CORE ELECTIVE LIST

Code No	Subjects	L	T	P	C
UECSB16	Graphics and Image Processing	3	0	0	3
UECSB34	Information Security	3	0	0	3
UECSB35	User Interface Design	3	0	0	3
UECSB36	High Speed Networks	3	0	0	3
UECSB38	Component Based Technology	3	0	0	3
UECSB41	Cloud Computing	3	0	0	3
UECSB42	Database Technologies	3	0	0	3
UECSB43	Distributed Computing	3	0	0	3
UECSB44	Information and Coding Theory	3	0	0	3
UECSB45	Parallel Computing	3	0	0	3
UEBAB01	Total Quality Management	3	0	0	3
UECSB46	UNIX Internals	3	0	0	3
UECSB47	TCP/IP Design and Implementation	3	0	0	3
UECSB48	Soft Computing	3	0	0	3
UECSB49	Web Technology	3	0	0	3
UECSB50	Multimedia Systems	3	0	0	3
UECSB51	Enterprise Resource Planning	3	0	0	3
UECSB52	Service Oriented Architecture	3	0	0	3
UECSB53	Advanced Java Programming	3	0	0	3
UECSB54	Open Source Systems	3	0	0	3
UECSB55	Mobile Adhoc and Sensor Networks	3	0	0	3
UECSB57	Virtualization Technologies	3	0	0	3
UECSB59	Software Testing	3	0	0	3

L – Lecture; T – Tutorial; P – Practical; C – Credit

OPEN ELECTIVE LIST

Code No	Subjects	L	T	P	C
UEEEB42	Embedded System Design	3	0	0	3
UECSB33	Real Time Systems	3	0	0	3
UECSB37	Robotics	3	0	0	3
UECSB39	Software Quality Assurance	3	0	0	3
UECSB40	Knowledge Based Decision Support Systems	3	0	0	3
UEBAB04	Professional Ethics and Human Values	3	0	0	3
UECSB58	Mobile Application Development	3	0	0	3
UECSB60	Business Intelligence and its Applications	3	0	0	3
UECSB61	Introduction to Mainframes	3	0	0	3
UECSB62	Building Enterprise Applications	3	0	0	3
UECSB63	Developing Web Applications In .Net	3	0	0	3

L – Lecture; T – Tutorial; P – Practical; C – Credit

B.TECH. COMPUTER SCIENCE AND ENGINEERING
Curriculum &Syllabus [Regulation BR (2014)]

SEMESTER I

Course Code	Course Name	L	T	P	C
THEORY					
U1GEB20	Engineering English - I	2	0	0	2
U1GEB21	Engineering Mathematics - I	3	1	0	4
U1GEB22	Engineering Physics - I	2	0	0	2
U1GEB23	Engineering Chemistry - I	2	0	0	2
U1GEB24	Principles of Electrical and Electronics Engineering	3	0	0	3
U1GEB25	Basics of Computing and C Programming	3	0	0	3
PRACTICAL					
U1GEB26	Engineering Physics and Chemistry Laboratory - I	0	0	4	2
U1GEB27	Principles of Electrical and Electronics Engineering Laboratory	0	0	3	2
U1GEB28	Computer Practices laboratory	0	0	3	2
Total		15	1	10	22

SEMESTER I

U1GEB01 COMMUNICATIVE ENGLISH I **L T P C**
3 0 0 3

OBJECTIVES

- To enable all students of Engineering and Technology develope their basic communication skills in English.
- To achieve specific linguistic and communicative competence in order for them to acquire relevant skills and function efficiently in a realistic working context
- To inculcate the habit of reading for pleasure

COURSE OUTCOME

After completing this course, students will be able to:

- Respond orally to the written works, grounding their ideas in the text
- Formulate open-ended questions in order to explore a topic of interest
- Engage in analytical and critical dialogue orally
- Engage in daily, meaningful reading tasks in English class and/or at home
- Develop interpersonal skills on current problems and events

PREPREQUISITE

- Basic Grammar
- Communicative skills

COURSE CONTENTS

UNIT I COMMUNICATIVE GRAMMAR (9)

Parts of Speech -Time, Tense and Aspect -Active and Passive Voice -WH Questions & Question Tag-Concord

UNIT II COMPOSITION (9)

Vocabulary - Single word substitutes -Use of abbreviations & acronyms-Definitions and Extended Definitions-Dialogue Writing-Paragraph Writing-Report, its importance and Report Writing

UNIT III IMPORTANCE OF COMMUNICATION (9)

Process of Communication and factors -Verbal and Non-verbal Communication -Listening Skills -Reading Skills -Speaking skills -Writing skills.

UNIT IV WRITTEN SKILLS (9)

Letter writing- Formal and Informal letters-Process Description-Transcoding and transformation of information-Note taking

UNIT V INTERPERSONAL SKILLS (9)

Creative thinking - Critical thinking-Discussion of current events and problems-Offering suggestions/ solutions/ opinions

Total: 45 Periods

TEXT BOOKS

1. Andera, J.Rutherford**.** Basic Communication Skills for Technology, Second edition, Pearson Education,2007
2. Butterfield, Jeff. Soft Skills for Everyone**,** Cegage learning**,** Canada, 2011

REFERENCES

1. Bailey, Stephen. Academic Writing: A Practical Guide for Students. New York: Rutledge, 2011.
2. Morgan, David and Nicholas Regan. Take-Off: Technical English for Engineering. Garnet Publishing Limited. New York: Longman, 2008.
3. Ganesan. S, Persis Mary T & Subhashini.B. Communication in English, Himalaya Publishing House, Mumbai, 2009.
4. Pickett, Nell Ann, Ann A.Laster and Katherine E.Staples. Technical English: Writing, Reading and Speaking. New York: Longman, 2009.

U1GEB02 ENGINEERING MATHEMATICS-I **L T P C**
3 1 0 4

COURSE OBJECTIVES

- To develop the basic mathematical knowledge and computational skills of the students in the areas of applied mathematics.
- To develop the skills of the students in the areas of several variable Calculus and Matrices
- To teach fundamental topics required for understanding Engineering studies

COURSE OUTCOME

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

- Calculate eigenvalues and eigenvectors, apply Caley-Hamilton theorem, and diagonalize of symmetric matrices and demonstrate the nature of quadratic forms
- Discuss the convergence and divergence of sequence and series of real numbers using various tests
- Demonstrate understanding of the derivatives of functions of several variables, viz., partial and total differentiation, and differentiation of implicit functions and optimize the functions of several variables using Hessian method and Lagrangian method.
- Evaluate double integration and triple integration using Cartesian, polar co-ordinates and the concept of Jacobian of transformation from one coordinate system to another coordinate system.
- Identify the improperness in integrals and evaluate the integrals using appropriate mathematical tools and how to apply beta and gamma integrals keeping improperness in mind.

PREPREQUISITE

- Basic Mathematics
- Differential Calculus
- Integral Calculus

COURSE CONTENTS

UNIT I MATRICES **9 + 3**

Characteristic equation - Eigen values and Eigen vectors of a real matrix – Statement of Cayley- Hamilton theorem – Applications of Cayley -Hamilton theorem in finding the inverse of a non-singular matrix and the power of a square matrix – Diagonalization of symmetric matrices – Nature of Quadratic forms

UNIT II SEQUENCES AND SERIES **9 + 3**

Sequences – Convergence of series – Series of positive terms – Tests for convergence (n-th term, ratio, comparison, root and integral tests) and divergence - Leibnitz test for alternating series –Series of positive and negative terms - Absolute and conditional convergence– Power series – Taylor and Maclaurin series

UNIT III DIFFERENTIAL CALCULUS OF SEVERAL VARABLES 9 + 3

Limits and continuity- Partial Derivatives – Total derivative – Differentiation of implicit functions – inverse functions – Jacobian – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers

UNIT IV INTEGRAL CALCULUS OF SEVERAL VARIABLES 9 + 3

Double integrals- Change of order of integration – Double integrals in polar coordinates – Triple integrals – Area as a double integral – Volume as a triple integral

UNIT V IMPROPER INTEGRALS 9 + 3

Meaning of improper integrals - Beta and Gamma functions – properties –Reduction formula for Γ(n) – Relation between gamma and beta functions - Evaluation of integrals using Beta and gamma functions – simple problems.

Total : 45+15(Tutorial) =60 periods

TEXT BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition, 2011.
2. Jain R.K and Iyengar,S.R.K Advanced Engineering Mathematics, 3rd edition, Narosa Publishing House, 2009.

REFERENCE BOOKS

1. Duraipandian P, Udayabaskaran S and Karthikeyan T, Engineering Mathematics (I Year) Muhil Publishers, 2010
2. Kreyszig E, , Advanced Engineering Mathematics, 9th edition, Wiley, 2005.
3. Peter O' Neil, Advanced Engineering Mathematics, Cengage Learning, Boston, USA, 2012.

U1GEB03 ENGINEERING PHYSICS – I **L T P C**
3 0 0 3

COURSE OBJECTIVES

- To understand the basic laws of physics and their applications in engineering and technology.
- To develop scientific temper and analytical capability.
- To solve various engineering problems.

COURSE OUTCOME

Students undergoing this course will

- Have a fundamental understanding of basic physics concepts and its applications in a day to day life, demonstrate the knowledge in ultrasonic applications and its importance and explain the utilizations of the electron beams in modern technologies such s CRT, CRO, etc.
- Be able to explain the basic understandings of the matter, crystal structure and its fundamental properties including crystal systems and Miller indices and show their understanding of the conductivity nature of metals and the classification of the solids learned from the Band Theory of Solids.
- Be able to understand the widely used current technologies such as mobile phones, solar cells for which semiconductor technology is essential. The concept of semiconductors and its wide applications will motivate the students to the currently developing topics.

PREPREQUISITE

- Basic Mathematics
- Basic Science

COURSE CONTENTS

UNIT-I: ACOUSTICS **9**

Introduction, sound waves - Pitch and Intensity. Reflection of sound waves, Sabine formula, absorption of sound, reverberation theory. Ultrasonic's – production - magnetostriction oscillator and piezoelectric oscillator. Properties and applications.

UNIT -II: ELECTRON OPTICS **9**

Introduction, Electron-refraction-Bethe's law, Electron Gun and Electron Lens. Cathode Ray Tube and Cathode Ray Oscilloscope. Cyclotron, Bainbridge Mass Spectrograph. Optical microscope, Electron Microscope - Applications.

UNIT -III: CRYSTAL STRUCTURES AND X-RAYS **9**

Introduction, Space lattice, unit cell, lattice parameters, Bravais Lattice - Crystal systems. Characteristics of Unit cell (Cubic System). Miller indices of planes. X-Rays –production, Bragg's Law. Powder crystal method and rotating crystal method.

UNIT -IV: BAND THEORY OF SOLIDS **9**

Introduction, Electrical conduction, conductivity, drift velocity, influence of external factors on conductivity. The Band Theory of solids, Energy Bands, Energy Gap. Classification of

solids, Energy Band structure of a conductor. Fermi-Dirac distribution function and Fermi Energy. Energy Band structure of an Insulator and semiconductor.

UNIT -V: SEMICONDUCTORS 9

Introduction, Types- Intrinsic and Extrinsic semiconductors. Intrinsic carriers-electron and hole concentrations. Fermi level in intrinsic carrier density, Conductivity, Doping of impurities-N-type and P-Type. Temperature variation-law of mass action-Charge neutrality condition- Fermi level in extrinsic semiconductor-Hall effect. Applications- Semiconductor diode, Transistor, FET, MOSFET.

Total: 45 periods

TEXT BOOKS

1. M.N. Avadhanulu and P.G. Kshirsagar ,A Text Book of Engineering Physics, S.CHAND and Co, 2012.
2. Gaur and Gupta, Engineering Physics , Dhanpat Rai publications, 2009

REFERENCES

1. S.O.Pillai ,Solid State Physics,New age international publications, 2010.
2. M.Arumugam, Engineering Physics,Anuradha publications, 2009.
3. Charles Kittel ,Introduction to Solid State Physics ,Wiley India publications, 2009.
4. Introduction to Solids –L.Azaroff TMH,33rd Reprint 2009.
5. Materials Science and Engineering – William Calister – Wiley India- Sixth Edition 2009.
6. www.schandgroup.com, www.google.com

U1GEB04 ENGINEERING CHEMISTRY- I **LTPC**
3 0 0 3

COURSE OBJECTIVE

The basic objective of Engineering Chemistry is to educate the students about the chemical aspects of engineering and to provide leadership in advanced studies of engineering, in industry, academia and government.

COURSE OUTCOME

After completing first semester, students from all branches of engineering will possess:

- Students will have knowledge about the design of boilers and its conditioning methods
- Students will develop understanding of the concepts and importance of the domestic water treatment methodology which is useful for the industries.
- Students will have knowledge about the industrial applications of adsorption techniques.
- Students will have knowledge about the energy sources and batteries along with the need of new materials to improve energy storage capabilities.
- Students will have understanding about spectroscopic instruments required for discovery and characterization methods of new materials.

PREPREQUISITE

- Basic Mathematics
- Basic Science

COURSE CONTENTS

UNIT- I WATER TECHNOLOGY (9)

Introduction- Hardness-Types and estimation by EDTA method-Boiler feed water-requirements- disadvantages of using hard water in boilers- internal conditioning (phosphate, calgon and carbonate conditioning methods)-external conditioning method-demineralization process-desalination-reverse osmosis- Electrodialysis- Domestic water treatment.

UNIT- II SURFACE CHEMISTRY (9)

Introduction-types of adsorption-adsorption of gases on solids, solute from solution-adsorption isotherm- Freundlich and Langmuir adsorption isotherm- Role of adsorbent in catalysis- ion exchange reaction- chromatography – applications of adsorption in industries – role of activated carbon in pollution abatement of air and waste water- Industrial applications of adsorption.

UNIT III ELECTROCHEMISTRY (9)

Electrochemical cells- reversible and irreversible cell- EMF measurement - single electrode potential- Nernst equation-problems-reference electrode- SHE-Calomel electrode-Glass electrode-measurement of p^H-electrochemical series- significance- potentiometric titration – precipitation titration –conductometric titration.

UNIT- IV ENERGY SOURCES AND STORAGE DEVICES (9)

Renewable and non renewable energy resources- nuclear fission- fusion-chain reaction-nuclear energy- nuclear reactor–light water nuclear power plant- wind energy- solar energy-

tidal energy- types of battery- alkaline battery- lead acid- nickel cadmium-lithium battery-H_2-O_2 fuel cells.

UNIT –V SPECTROSCOPY (9)

Introduction- Electromagnetic radiation- absorption of electromagnetic radiation- interaction of electromagnetic radiation with matter- Beer- Lambert's law- principle & instrumentation of UV- Visible spectroscopy, IR spectroscopy- estimation of iron by colorimetry- flame photometry- instrumentation (block diagram)- estimation of sodium by flame photometry- Microwave spectroscopy and its applications.

Total : 45 periods

TEXT BOOKS

1. P.C.Jain and Monica Jain - "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi (2002).
2. S.S.Dara- "A Text book of Engineering Chemistry" S.Chand&Co.Ltd., New Delhi (2006).
3. Ravikrishnan– Engineering Chemistry, Sri Krishna Publication, Chennai.

REFERENCES

1. B.K.Sharma - "Engineering Chemistry", Krishna Prakasan Media (P) Ltd., Meerut (2001) .
2. B.Sivasankar - "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd. New Delhi (2008).
3. B.R.Puri, L.R.Sharma, S.Pathania - "Principles of physical Chemistry,ShobanLalnagin Chand & Co., Jalandhar (2000).

U1GEB05 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LTPC
3 0 0 3

COURSE OBJECTIVES:

- To impart knowledge in various AC circuit parameters.
- To impart knowledge in various DC circuit parameters.

COURSE OUTCOME

- Students are expected to learn the physical recognition of different electrical components like Resistances, Inductances, Capacitances and their ratings.
- Students are expected to have learnt the verifications of basic laws of electric circuits like Ohm's law and Kirchhoffs' laws.
- Students are expected to connect electric circuits, and able to use electric instruments to perform experiments.

COURSE CONTENTS

UNIT I D.C.CIRCUITS 9

Electrical quantities, Ohm's Law, Resistors, Inductors, Capacitors - Series and parallel combinations, Kirchhoff's laws, source transformation, Node and Mesh Analysis - Star delta Transformation.

UNIT II MAGNETIC CIRCUITS 9

Definition of MMF, Flux and reluctance - Leakage factor - Reluctances in series and parallel (series and parallel magnetic circuits) - Electromagnetic induction - Fleming's rule - Lenz's law - Faraday's laws - statically and dynamically induced EMF - Self and mutual inductance - Energy stored and energy density - Analogy of electric and magnetic circuits.

UNIT III A.C.CIRCUITS 9

Sinusoidal functions - RMS(effective) and Average values- Phasor representation - J operator – sinusoidal excitation applied to purely resistive , inductive and capacitive circuits - RL , RC and RLC series and parallel circuits - power and power factor - Three phase circuits - Star / delta connections - with balanced loads - measurement of power by two wattmeter method.

UNIT IV SEMICONDUCTOR DEVICES AND LOGIC GATES 9

Discrete devices - PN junction diodes - Zener diodes - Tunnel diodes- Thermistors - Bipolar junction transistors- Field effect transistors (FET and MOSFET) –Uni junction transistors - Silicon controlled rectifiers and Triacs. Universal Gates - Half Adder - Full Adder.

UNIT V RECTIFIERS, AMPLIFIERS AND OSCILLATORS 9

Half and full wave rectifiers- Capacitive and inductive filters- ripple factor- PIV-rectification efficiency. CB, CE and CC Configuration - RC coupled amplifier- positive and negative feedback - Barkhausen criterion for oscillations -RC and LC oscillators. Introduction to power supplies.

TOTAL: 45Periods

TEXT BOOKS

1. Mittle.B.N, Aravind Mittle, "Basic Electrical Engineering", Tata McGraw Hill", 2nd Edition. Sep 2005.

2. Theraja.B.L, "Fundamentals of Electrical Engineering and Electronics", S.Chand & Co., 1st Multicolor Edition, 2006 (Reprint 2009).
3. Sedha.R.S, A Text book of Applied electronics, 2nd Edition, S.Chand & company, 2005.
4. Bhattacharya.S.K and Renu vig, Principles of electronics, 3rd Edition, S.K.Kataria & Sons, 2002

REFERENCES

1. Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", PHI Learning Private Ltd, 2nd Edition, 2010.
2. Wadhwa.C.L, "Basic Electrical Engineering", New Age International, 4th Edition, 2007. (Reprint June 2010)
3. Abhijit Chakrabarti, Sudipta nath & Chandan Kumar Chanda, "Basic Electrical Engineering", Tata McGraw Hill, 1st Edition, 2009.
4. T. Thyagarajan, “Fundamentals of Electrical Engineering”, SciTech Publications, 5th Edition, Reprint Jan 2010.
5. books.google.co.in/books/.../Basic_Electrical_Engineering.ht
6. www.e-booksdirectory.com › Engineering

U1GEB06 ENGINEERING GRAPHICS L T P C
(First angle projection method is to be followed) 3 1 0 4

COURSE OBJECTIVES

- To familiarize the students with the construction methods of various objects and their applications.
- To understand the basic concepts of conic sections, projections and developments of objects.
- To develop the imagination and drafting skills of students.

COURSE OUTCOME

- Frame ideas based on the conceptual modelling and design
- Provide good understanding of the methods involved in preparing various views in engineering drawings

COURSE CONTENTS
INTRODUCTION (Not to be included for examination)

Drawing instruments and their use – Bureau of Indian Standards (BIS) conventions – free-hand lettering – dimensioning – simple geometric constructions.

UNIT I: CONIC SECTIONS AND FREE HAND SKETCHING 9+3
Construction of ellipse (concentric circle and eccentricity methods), construction of parabola (rectangle and eccentricity methods), construction of hyperbola (eccentricity method) Free-hand sketching of orthographic views of pictorial views of solids – free-hand sketching of pictorial views of solids given the orthographic views.

UNIT II: PROJECTION OF POINTS, STRAIGHT LINES & PLANES 9+3
Orthographic projections of points, orthographic projections of straight lines located in the first quadrant only – determination of true lengths and true inclinations – orthographic projections of polygonal surface and circular lamina inclined to both reference planes.

UNIT III: PROJECTIONS OF SOLIDS 9+3
Projections of simple solids (prisms, pyramids, cylinder and cone) when the axis is inclined to one reference plane by change of position and change of reference line methods.

UNIT IV: SECTIONS OF SOLIDS & DEVELOPMENT OF SURFACES 9+3
Sections of solids (prisms, pyramids, cylinder and cone) in simple vertical position by using cutting plane inclined to one reference plane and perpendicular to the other – obtaining true shape of section.
Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinder and cone – development of lateral surfaces of solids with cylindrical cutouts perpendicular to the axis.

UNIT V: ISOMETRIC & PERSPECTIVE PROJECTION 9+3

Principles of isometric projection - isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones – isometric view of combination of two simple solids.Perspective projection of prisms, pyramids and cylinder by visual ray method and vanishing points method.

Total : 45+15(Tutorial) =60 periods

BEYOND THE SYLLABUS

Scales and Dimensioning Principles, Intersection of solids, Computer Aided Drafting, Development of solid surfaces with square cut –out, Building Drawings.

TEXT BOOKS

1. K.V.Natarajan, A text Book of Engineering Graphics, Dhanalakshmi Publisher, Chennai – 42, 2009
2. 2.Venugopal K., "Engineering Graphics", New Age International (P) Limited, 2002.

REFERENCES

1. 1.Warren J. Luzadder and Jon. M.Duff, "Fundamentals of Engineering Drawing", Prentice Hall of India Pvt., Ltd., Eleventh Edition, 2001.
2. B.Bhattacharyya, S.C.Bera,Engineering Graphics ., I.K .International Pvt Ltd., 2009
3. M.S. Kumar ., Engineering Graphics.,Dd Publications, 2008
4. Jeyapoovan.T., Vikas Publishing House Engineering Graphics with using Auto CAD,2007
5. BIS code: SP 46:2003 Engineering Drawing practice for Schools & Colleges
6. http://www.teachertube.com, ***Engineering Graphics*.**
7. http://www.ustudy.in, Engineering Graphics

U1GEB07 ENGINEERING PHYSICS AND CHEMISTRY LABORATORY L T P C
0 0 4 2

COURSE OBJECTIVES

- To impart skills in measurements.
- To design and plan the experimental procedure and to record and process the results.
- To reach non trivial conclusions of significant of the experiments.

COURSE OUTCOME

After the completion of the experiments in Physics lab, students gain

- Skills on measurements
- Knowledge to design
- Plan the experimental procedure
- To record and process the results
- Ability to analyze the results

ENGINEERING PHYSICS LAB

1. **Torsional Pendulum**
   To determine the moment of inertia of the disc and the rigidity modulus of the wire by Torsional oscillations.
2. **Newtons' Rings**
   To find the focal length of a lens by forming Newton's ring.
3. **Dispersive power of the Prism**
   To find the dispersive power of the material of the prism using spectrometer.
4. **Laser Grating**
   (i) Determination of wavelength of Laser using Grating and Particle size determination
   (ii) Determination of Numerical Aperture and Acceptance angle of an Optical Fibre
5. **Ultrasonic Interferometer**
   Determination of Velocity of ultrasonic waves in a liquid and compressibility of the liquid.
6. **Young's Modulus – Non-Uniform Bending**
   To determine Young's modulus of the material of the beam by Non uniform bending method.

ENGINEERING CHEMISTRY LABORATORY

AIM

To understand the principles and technological knowledge involved in electrical and non-electrical experiments in chemistry.

OBJECTIVES

Students should develop the experimental skills both manually and by instrumentation of "qualitative and quantitative analysis" of solutions.

LIST OF EXPERIMENTS
(ANY FIVE)

1. Estimation of hardness of Water by EDTA.
2. Determination of DO in water (Winkler's Method).
3. Estimation of Chloride in Water sample (Argentometric).
4. Estimation of alkalinity of Water sample.
5. Conductometric titration (Strong acidVs Strong base).
6. Conductometric precipitation titration using $BaCl_2$Vs Na_2 SO_4.

U1GEB08 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY **L T P C**
0 0 3 2

COURSE OUTCOME

- Students are expected to perform good in viva voce exams
- Students are expected to verify various laws using electrical instruments
- Students are expected to verify ratings for various components like CFL's, fluorescent tube etc
- Students are expected to perform open circuit and short circuit tests on transformers and get familiar with various electric motors and their construction

COURSE OBJECTIVES:

- To verify Kirchhoff's laws
- To make the students to understand the circuit parameters and their influence.

(ANY TEN EXPERIMENTS)

1. a. Staircase wiring and lamp wiring.
   b. Measurement of Electrical Quantities.
2. Characteristics of PN junction Diode.
3. Characteristics of BJT
4. Verification of Kirchhoff's laws.
5. Verification of logic gates.
6. Study of CRO and measurement of frequency and phase difference using CRO.
7. Frequency response of series RLC circuits.
8. Characteristics of FET.
9. Transient response of series RL and RC circuits.
10. Half wave and full wave rectifier using diodes.
11. RC filters.

U1GEB09 ENGINEERING PRACTICE LABORATORY **L T P C**
0 0 3 2

COURSE OBJECTIVES

To have wide knowledge on

- Plumbing tools – house hold plumbing fittings and Carpentry process – Carpentry tools, types of joints.
- Types of welding & tools.
- Types of machining and operations, machine tools, cutting tools (Lathe, Drilling).
- Sheet metal – definition, working tools, operations - forming & bending.

COURSE OUTCOME

Students undergoing this laboratory will

- Demonstrate wide knowledge on mechanical and civil operations

I CIVIL ENGINEERING PRACTICE

Plumbing Works:

a) Preparation of plumbing line sketches for
   i. water supply line
   ii. sewage works.

b) Basic pipe connections using valves, taps, couplings, unions, reduces elbows in house hold fitting.

Carpentry using Power Tools only:

(a) Study of the joints in roofs, doors, windows and furniture.

(b) Hands-on-exercise:

Power sawing, Power Planning and making various joints.

II MECHANICAL ENGINEERING PRACTICE

Welding:

(a) Preparation of Arc welding practice – butt joints and lap joints.

(b) Preparation of Gas welding practice – butt joints and lap joints.

Basic Machining:

(a) Simple Turning and Taper turning in lathe.

(b) Drilling Practice.

Sheet Metal Work:

(a) Forming & Bending:

(b) Model making – Trays, funnels, etc.

SEMESTER II

COURSE CODE	COURSE NAME:	L	T	P	C
THEORY					
U2GEB10	Communicative English-II	3	0	0	3
U2GEB11	Engineering Mathematics –II	3	1	0	4
U2GEB12	Engineering Physics – II	3	0	0	3
U2GEB13	Engineering Chemistry – II	3	0	0	3
U2GEB14	Basics of Mechanical and Civil Engineering	3	0	0	3
U2GEB15	Fundamentals of Computing and Programming	3	0	0	3
PRACTICAL					
U2GEB16	Computer Practice Laboratory	0	0	3	2
U2GEB17	Engineering Physics & Chemistry Laboratory-II	0	0	4	2
U2GEB18	Communication Skills Laboratory	0	0	3	2
Total Credits		**18**	**1**	**10**	**25**

SEMESTER II

U2GEB10 COMMUNICATIVE ENGLISH II **L T P C**
3 0 0 3

OBJECTIVES

- To enable the students to become aware of their present communication skills and the skills they will need to function as successful professionals.
- To encourage them to acquire the necessary skills so that they can handle day to-day personal and professional responsibilities
- To build their confidence and to instill competitiveness by projecting a positive image of themselves and their future

COURSE OUTCOME

After undergoing this course, students will be able to:

- Communicate using modal verbs, conditionals, gerund and articles
- Write, compare, contrast, and analyze articles on a given topic using Synonyms, Antonyms, and Homonyms
- Prepare themselves in pre-interview process
- Respond in group discussion, literal, interpretative, and evaluative stances.

COURSE CONTENTS

UNIT I COMMUNICATIVE GRAMMAR (9)

Modal verbs-Conditionals — 'If' clauses-Cause and Effect –Gerund-Articles

UNIT II WRITING SKILLS (9)

Synonyms, Antonyms and Homonyms -Word Formation -Nominal compounds –Instructions-Mini project writing

UNIT III WRITING AT WORK (9)

Business letters-Email, Fax, Memo-Notice, Circulars-Job Applications - Dos and don'ts-CV and Cover letter

UNIT IV CORPORATE COMMUNICATION (9)

Group Discussion-Interview Skills-Types of meeting-Agenda, Minutes

UNIT V CONVERSATION SKILLS (9)

Presentation Skills-Persuasive speech-Dealing with clients-Crisis management Trouble Shooting

Total: 45 periods

TEXT BOOKS

1. Andera, J.Rutherford. Basic Communication Skills for Technology, Second edition, Pearson Education,2007
2. Butterfield, Jeff. Soft Skills for Everyone, Cegage learning, Canada, 2011

REFERENCES

1. Ganesan. S, Persis Mary T & Subhashini.B. Communication in English, Himalaya Publishing House, Mumbai, 2009.
2. Pickett, Nell Ann, Ann A.Laster and Katherine E.Staples. Technical English: Writing, Reading and Speaking. New York: Longman, 2010.
3. Rizvi, M.Ashraf. Effective Technical Communication. New Delhi: Tata McGraw-Hill Publishing Company, 2007.
4. Morgan, David and Nicholas Regan. Take-Off: Technical English for Engineering. Garnet Publishing Limited. New York: Longman, 2008.
5. Meenakshi Raman and Sangeeta Sharma, 'Technical Communication English skills for Engineers', Oxford University Press, 2008.
6. http://www.lonestar.edu/useful-websites-for-students.htm
7. www.english-for-students.com/
8. www.britishcouncil.org
9. www.sfsu.edu/~puboff/onestop.htm
10. www.uefap.com
11. www.eslcafe.com
12. www.listen-to-english.com
13. www.owl.english.purdue.edu
14. www.chompchomp.com

U2GEB11 ENGINEERING MATHEMATICS–II **L T P C**
3 1 0 4

AIM AND OBJECTIVES

- To develop the skills of the students in the areas of Vector Calculus, Integral Calculus, Complex variables, Laplace Transform and ordinary differential equations
- To teach fundamental topics required for understanding Engineering studies
- To serve as a pre-requisite mathematics course for post graduate courses, specialized studies and research

COURSE OUTCOME

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

- Take Laplace transformation of different types of functions, derivatives and integrals, and how it converts complex systems into simple algebraic equations to find out solutions
- Demonstrate the understanding of solving ordinary differential equations using operator methods, method of undetermined coefficients, method of variation of parameters and Laplace transformation techniques
- Perform gradient, divergence and curl operations in vector and scalar fields, apply Green's theorem, Gauss Theorem, and Stokes theorem as the generalization of fundamental theorem of Integral calculus.
- Distinguish between real function differentiation and complex function differentiation, applicability of analytic and harmonic nature of complex valued function in electrical engineering and study of fluids
- Apply complex integration using Cauchy's integral theorem and Cauchy's residue theorem and their applications in evaluating integrals.

COURSE CONTENTS

UNIT I LAPLACE TRANSFORM **9 + 3**

Laplace transform – Sufficient Condition for existence – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function and impulse functions – Transform of periodic functions - Inverse Laplace transform– Convolution theorem (excluding proof) – Initial and Final value theorems

UNIT II ORDINARY DIFFERENTIAL EQUATIONS **9 + 3**

Higher order linear differential equations with constant coefficients –Method of undetermined coefficients - Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients – Solution of linear ODE of second order with constant coefficients using Laplace transform

UNIT III VECTOR CALCULUS **9 + 3**

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

UNIT IV ANALYTIC FUNCTIONS 9 + 3

Functions of a complex variable – Analytic functions – Necessary conditions, Cauchy – Riemann equation and Sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping : w= z+c, cz, 1/z, and bilinear transformation.

UNIT V COMPLEX INTEGRATION 9 + 3

Complex integration – Statement and applications of Cauchy's integral theorem and Cauchy's integral formula – Taylor and Laurent expansions – Singular points – Residues – Residue theorem – Application of residue theorem to evaluate real integrals –Unit circle and semi-circular contour(excluding poles on boundaries).

Total: 45+15=60 periods

TEXT BOOKS

1. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, (2011).
2. Jain. R. K and. Iyengar, S.R.K, Advanced Engineering Mathematics, 3rd edition, Narosa Publishing House, 2009

REFERENCE BOOKS

1. Sundarapandian V, Ordinary and Partial Differential Equations, McGraw Hill Education, New Delhi, India, 2012.
2. Kreyszig E, , Advanced Engineering Mathematics, 9th edition, Wiley, 2005.
3. Peter O' Neil, Advanced Engineering Mathematics, Cengage Learning, Boston, USA, 2012.
4 Dean G. Duffy. Advanced Engineering Mathematics with MATLAB, 2ndEdn. Chapman & Hall / CRC Press.New York, 2003 (Taylor and Francis, e-library, 2009)

U2GEB12 ENGINEERING PHYSICS – II **L T P C**
3 0 0 3

OBJECTIVES

- Basically this is a basic course to understand properties of various materials.
- To develop basic understanding of the rapidly changing technological scenario.
- To impart the requisite understanding for the appropriate selection of materials for various engineering applications.

COURSE OUTCOME

Students undergoing this course will have

- An in depth knowledge in various aspects of Physics and its applications
- A clear understanding of quantum physics, Laser and Fiber Optics in engineering and technology
- The basic understanding of fundamental properties of Modern engineering materials such as magnetic, dielectric, conducting, semiconducting, superconducting materials and its use in technology and day to day life
- The potential in planning projects at higher semesters
- The sound knowledge about the basic concepts of the novel and emerging nanotechnology and the various preparation methods of nonmaterial such as CVD, PLD and so on. Further, use of nanotechnology in daily life will stimulate and motivate the students towards manufacturing or research.

COURSE CONTENTS

UNIT -I ATOMIC PHYSICS **9**

Introduction, ultraviolet catastrophe, Planck's Quantum hypothesis, Photoelectric effect, Measurement of K.E. of photoelectrons, stopping potential. Failures of Classical theory. Compton effect, Compton Theory. Dual nature of matter. deBroglie Hypothesis. Davisson – Germer Experiment, Heisenberg's Uncertainty Principle (Statement only). Time-In dependant Schrodinger wave equation, Eigen values, Eigen functions and Expectation values. Applications of Schrodinger wave equation- Particle in a box.

UNIT -II LASERS AND OPTICAL FIBERS **9**

Introduction, Interaction of Radiation with Matter –Quantum mechanical view. Essentials of Laser. Types of Laser He-Ne Laser, Ruby Laser, semiconductor Laser. Application of Lasers. Optical Fibers –Modes of Propagation, Types of optical fibers. Optical fiber communication system. Attenuation.

UNIT-III SUPERCONDUCTIVITY **9**

Discovery of superconductivity, , Heat Capacity, Isotope effect, persistent currents, effect of external magnetic field, critical; current density, Behavior of a perfect conductor, Meissner effect, London penetration depth. BCS Theory. Type of superconductors. Josephson effect (AC and DC). Applications – Maglevs, SQUIDS.

UNIT -IV MAGNETIC AND DIELECTRIC MATERIALS **9**

Introduction- Measurement of Magnetic Susceptibility-Magnetic materials (Dia, Para, Ferro, Antiferro and Ferri)- Magnetic moment of atom-Hard and soft magnetic materials- Hysteresis

curve – Applications-Dielectrics-– Electronic, ionic and orientational, space polarizations – Internal fields in solids – Polarization-Induced dipoles-Nonpolar and Polar dielectries-Clausius Mosotti equation-Dielectric loss.

UNIT -V NANOTECHNOLOGY AND ADVANCED MATERIALS 9

Introduction– Nano phase materials – Synthesis – Plasma arcing – chemical vapour deposition – Sol gel method – Electro deposition – Ball milling – properties and application – Carbon nano tubes – types, fabrication methods – Arc method – Pulsed laser deposition – Structure, Properties and Application.

Total: 45 periods

TEXT BOOKS

1. M.N.Avadhanulu and P.G.Kshirsagar ,A Text Book of Engineering Physics, S.CHAND and Co,2012.
2. Gaur and Gupta, Engineering Physics , Dhanpat Rai publications,2009

REFERENCES

1. T.Pradeep ,The essential understanding –Nanoscience and Nanotechnology-TMH, 2010.
2. William D.Callister ,Materials Science and Engineering, John Wiley &Sons- 2010
3. Charles Kittel ,Introduction to Solid State Physics -Wiley India publications,2009.
4. Mathews and Venkatesan ,Quantum Mechanics - TMH, 2008.
5. Anthony R. West, Introduction to Solid State Chemistry –Wiley India edition, 1999.
6. www.schandgroup.com

U2GEB13 ENGINEERING CHEMISTRY II **L T P C**
3 0 0 3

COURSE OBJECTIVES

Student should be conversant with the

Principles of corrosion and its control
Chemistry of Fuels and combustion
Industrially Important Engineering materials

COURSE OUTCOME

After completing second semester,

- Students will have knowledge about fuels and importance of new compounds which can be used as fuels
- Students will be acquainted with industrially important engineering polymers, their nature, chemical compositions and mode of action
- Students will have knowledge about the alloys which are useful to design the new materials for domestic and industrial purpose
- Students will show understanding about the methods available for corrosion control and their utility in automobile and other industries

COURSE CONTENTS

UNIT-I FUELS (9)

Classification, Characteristics of fuel, Comparison between Solid, liquid and gaseous fuels, Combustion and chemical principles involved in it, Calorific value: gross and net calorific values.

Solid Fuels: Coal: Classification, Analysis: Proximate and Ultimate analysis of coal and their importance, Metallurgical coke: Properties, Manufacture by Otto Hoffman process.

Liquid Fuels: Petroleum: its chemical composition and fractional distillation, Synthetic Petrol: Fischer-Tropsch process and Bergius Process, Knocking and chemical structure, octane number and cetane number and their significance,

Gaseous Fuels: Natural gas, artificial gas (water gas, producer gas, coal gas). Flue gas analysis – Orsat apparatus

UNIT-II PHASE RULE AND ALLOYS (9)

Statement and explanation of the terms involved- one component water system- condensed phase rule-construction of phase diagram by thermal analysis-simple eutectic systems (Lead-Silver system only) – Alloys - importance – ferrous alloys – Nichrome - stainless steel – non-ferrous alloys - brass and bronze.

UNIT-III POLYMERS (9)

Polymer, Classification based on, origin, structure, chemical structure, Degree of polymerization Types of polymerization - Thermosetting and Thermoplastic polymers and their applications-Degradation of polymers, Conducting polymer and Biopolymers, Introduction to polymeric composites, Types of composite materials.

UNIT-IV CORROSION AND ITS CONTROL (9)

Chemical corrosion – Pilling – Bedworth rule – electrochemical corrosion – different types – galvanic corrosion – differential aeration corrosion – factors influencing corrosion –

corrosion control – sacrificial anode and impressed cathodic current methods – corrosion inhibitors – protective coatings – paints – constituents and functions – metallic coatings – electroplating (Au) and electroless (Ni) plating.

UNIT-V ENGINEERING MATERIALS (9)

Refractories - Classification and properties, Lubricants- Classification and properties, Organic electronic materials - Solid oxide materials- Nano materials, Buckminister fullerenes.

Total: 45 periods

TEXT BOOKS

1. Jain & Jain, Engineering Chemistry, DhanpatRai&Company(2002).
2. S.S. Dara, Engineering Chemistry, S. Chand Pvt. Ltd.(2006).
3. A. Ravikrishnan and S. Sathish Kumar – Engineering Chemistry, Sri Krishna Publication, (2012) Chennai.

REFERENCES

1. J.C. Kuriacose& J. Rajaram, Chemistry in Engineering & Technology (Vol I & II),Tata McGraw Hill(2010).
2. H.D. Gesser, Applied Chemistry, Springer(2012).
3. V.R.Gowarikar, V.Viswanatha, Jayadevsreedhar, Polymer Science, Wiley(2006).
4. G. T. Austin, Shreve's Chemical Process Industries, Tata McGraw Hill(1984)
5. http://en.wikipedia.org/wiki/Fuel
6. http://en.wikipedia.org/wiki/Materials_science
7. http://www.ce.berkeley.edu/~paulmont/CE60New/alloys_steel.pdf

U2GEB14 FUNDAMENTALS OF COMPUTING AND PROGRAMMING L T P C
3 0 0 3

OBJECTIVES

- Learn the fundamentals of computing techniques
- Develop the simple applications in 'C' language

COURSE OUTCOME

After completing this course,

- Students are expected to perform C programs
- Students are expected to gain knowledge regarding the challenging programs
- Students are expected to know about the problem solving techniques
- Students are expected to know about the pointer concepts and file management techniques

COURSE CONTENTS

UNIT I BASICS OF COMPUTER AND INFORMATION TECHNOLOGY 9

Digital Computer Fundamentals–Block diagram of a computer–Components of a computer system–Applications of Computers–Hardware and Software definitions–Categories of Software–Booting–Installing and uninstalling Software–Software piracy–Software terminologies-Information Technology Basics–History of Internet–Internet Tools.

UNIT II PROBLEM SOLVING METHODOLOGY 9

Problem solving Techniques–Program–Program development cycle–Algorithm – Flow chart – Pseudo Code – Program control structures – Types and generation of programming languages – Development of algorithms for simple problems.

UNIT III INTRODUCTION TO C 9

Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operations – Decision Making - Branching and Looping.

UNIT-IV FUNCTIONS 9

Arrays- Character arrays and Strings - Defined Functions - Definition of Function – Declaration - Category of Functions - Nesting of Functions, Recursive function, Structures and Unions, Enumeration and Typedef.

UNIT V POINTERS, FILE MANAGEMENT AND OPERATING SYSTEM CONCEPTS 9

Pointers – File Management in C – Input / Output Operations on Files -The Preprocessor, Introduction to UNIX and LINUX programming.

TOTAL: 45 Periods

TEXT BOOKS

1. Reema Thareja, " Fundamentals of Computing & C Programming" Oxford University Press, 2012.
2. E.Balagurusamy, "Programming in ANSI C", Fifth Edition, Tata McGraw-Hill, 2011.
3. Ashok.N.Kamthane," Computer Programming", Fifth Edition Pearson Education, 2008.

4. Richard Petersen, “Linux: The Complete Reference”, Sixth Edition, Tata McGraw-Hill,2007
5. ITL Education Solutions Limited, ‘Introduction to Information Technology’, Pearson Education (India), 2005.

REFERENCES

1. P.Visu, R.Srinivasan and S.Koteeswaran, “Fundamentals of Computing and Programming”, Fourth Edition, Sri Krishna Publications, 2012.
2. E.Balagurusamy, “Computing Fundamentals and C Programming”, Tata McGraw-Hill,2008.
3. Pradip Dey, Manas Ghoush, “Programming in C”, Oxford University Press, 2007.
4. Byron Gottfried, “Programming with C”, 2 Edition, TMH Publications, 2008.
5. Stephen G.Kochan, “Programming in C”, Third Edition, Pearson Education India, 2005.
6. http://www.tutorialspoint.com/computer_fundamentals/
7. http://www.indiabix.com/computer-science/computer-fundamentals/
8. http://www.placementquestion.com/category/computer_fundamentals/
9. http://www.proprofs.com/quiz-school/story.php?title=fundamentals-computer-part-1

U2GEB15 BASIC MECHANICAL AND CIVIL ENGINEERING **L T P C**
3 0 0 3

OBJECTIVES

To gain a wide knowledge on:

- Manufacturing processes.
- Combustion engines.
- Refrigeration & Air-conditioning system.
- Construction Materials.

COURSE OUTCOME

After completing this course,

- The students can easily apply any of the tasks in their core technical subjects for making and working of any type of product
- The students will be able to analyze the material on the basis of their properties and thus assigning different weightage to their use for technical purposes
- The students will be able to assess the working conditions of any machining process and thus calculating the actual forces involved

COURSE CONTENTS

UNIT I MANUFACTURING PROCESSES 9

Introduction to Manufacturing & Machining - The Metal cutting process - Orthogonal and oblique metal cutting. Types of Machining Operations & Terminology – The Cutting Tool. Introduction to metal forming - Bulk deformation & Sheet metal working – Basic operations - Hot forming and cold forming. Introduction to Metal Joining Processes - Welding processes - Arc & Gas welding - AC & DC welding equipments - Brazing and soldering.

UNIT II COMBUSTION ENGINES 9

Principle of Internal and external combustion engines – Petrol engine, diesel engine, working principle and comparison - Two stroke and four stroke engines, working principle and comparison - Alternative fuels.

UNIT III REFRIGERATION & AIR-CONDITIONING SYSTEM 9

Introduction to Refrigeration– Non cyclic & Cyclic Refrigeration - Principle of vapour compression refrigeration system - Applications. Air-Conditioning – Layout of typical domestic refrigerator – Window and Split type Air conditioner – Applications

UNIT IV INTRODUCTION TO CIVIL ENGINEERING 9

Civil engineering --Importance of civil engineering -- Branches of civil engineering – Structures.

UNIT V CONSTRUCTION MATERIALS 9

Soil – Stones – Bricks – Timber -- Cement -- Concrete – Steel. Bearing capacity of soil -- Requirements of foundations -- Types of foundations.

TOTAL : 45periods

TEXT BOOKS

1. P K Nag., “Basic Mechanical Engineering”, Hi-tech Publications, (2007).
2. Ramamrutham. S, “Basic Civil Engineering”, Dhanpat Rai Publishing Co. (P) Ltd. (2004).
3. K.V. Natarajan, “Basic Civil Engineering”, M/s Dhanalakshmi, Chennai, 2010
4. Shanmugam G and Palanichamy M S, “Basic Civil and Mechanical Engineering”,Tata McGraw Hill Publishing Co., New Delhi, (2006).

REFERENCES

1. Rao P.N., “Manufacturing Technology”, 2nd Edition, Tata McGraw Hill Inc., New Delhi.
2. Surendra Singh, “Building Materials ", Vikas Publishing Company, New Delhi, 1996.
3. Khurmi R.S. & Gupta J.K., " A Text Book of Thermal Engineering “, S.Chand &Co., New Delhi, 2010
4. Campbell J.S., “Principles of Manufacturing Materials and Processes”, 14th Edition,Tata McGraw Hill.Inc., New Delhi, 2000.
5. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-ROORKEE/MANUFACTURING-PROCESSES/index.htm
6. http://www.animatedengines.com/
7. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Ref%20and%20Air%20Cond/New_index1.html
8. http://en.wikipedia.org/wiki/List_of_building_materials

U2GEB16 COMPUTER PRACTICE LABORATORY L T P C
0 0 3 2

COURSE OBJECTIVES

- To Practice the concepts of MS Word and MS excel
- To learn the C control structure and functions.
- To study the C Pointers and file system.

COURSE OUTCOME

After completing this course,

- Students are expected to design a program related to challenging questions
- Students are expected t have knowledge about MS word and the internet
- Students are expected to know and perform the programs regarding the classes
- Students are expected to perform well in sessional tests/class assignments/viva-voce examination

LIST OF EXPERIMENTS

1) Word Processing

a. Document creation, Text manipulation with Scientific notations.
b. Table creation, Table formatting and Conversion.
c. Mail merge and Letter preparation.
d. Drawing - flow Chart

2) Spread Sheet

a. Chart - Line, XY, Bar and Pie.
b. Formula - formula editor.
c. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
d. Sorting and Import / Export features

3. Find whether a given number is odd or even.
4. Find whether a given number is prime or not.
5. Design an arithmetic calculator using Switch-Case.
6. Find largest and smallest elements in an array.
7. Demonstrate Looping and Control structures.
8. Demonstrate the String functions.
9. Find a Factorial of a number of ranges between 1 to 41 using Recursive function.
10. Demonstrate the Structures and Unions for employee salary.
11. Perform pointer arithmetic Operations.
12. Program to develop student's information using file concept.

U2GEB17 ENGINEERING PHYSICS AND CHEMISTRY LABORATORY II

L T P C
0 0 4 2

COURSE OBJECTIVES

- To impart skills in measurements.
- To design and plan the experimental procedure and to record and process the results.
- To reach non trivial conclusions of significant of the experiments.

ENGINEERING PHYSICS LAB

COURSE OUTCOME

After the completion of the experiments in physics lab, students gain

- Skills on measurements
- Knowledge to design
- Plan the experimental procedure
- To record and process the results
- Ability to analyze the results

LIST OF EXPERIMENTS

1. **P.O.Box – energy gap of a semiconductor**
   To find the band gap of the given thermostat using post office box.

2. **Lee's Disc**
   To determine the thermal conductivity of the bad conductor by Lee's Disc method.

3. **Diffraction Grating – Spectrometer**
   To find the wavelengths of the prominent spectral lines in the mercury (Hg) source.

4. **Viscosity of Liquids**
   To determine the co-efficient of viscosity of the given liquid (water) by Poiseuille's method.

5. **Thermo emf by potentiometer**
   To find the E.M.F of the given thermocouple using a potentiometer

6. **Young's Modulus – uniform bending**
   To determine Young's modulus of the material of the beam by uniform bending method.

U2GEB18 COMMUNICATION SKILLS LABORATORY L T P C
0 0 3 2

COURSE OBJECTIVES

- To impart advanced skills of Technical Communication in English through Language Lab
- To enable the students to communicate confidently and competently in English Language in all spheres
- To familiarize the students with the sounds of English in a nutshell, particularly stress and intonation

COURSE OUTCOME

After the completion of the experiments in English lab, students will

- Able to pronounce words correctly
- Acquire knowledge in Phonetics
- Enrich vocabulary
- Enhance speaking skills
- Build sentences without errors

UNIT I LISTENING COMPREHENSION: (9)

Listening and typing – Listening and sequencing of sentences – Filling in the blanks - Listening and answering questions

UNIT II READING COMPREHENSION: (9)

Filling in the blanks - Close exercises – Vocabulary building - Reading and answering questions.

UNIT III SPEAKING: (9)

PC based session -Phonetics: Intonation – Ear training -Correct Pronunciation – Sound recognition Exercises – Common Errors in English-Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation) - Viewing and discussing audio-visual materials (Samples are available to learn and practice)

UNIT IV RESUME / REPORT PREPARATION / LETTER WRITING (9)

Structuring the resume / report -Letter writing / Email Communication -Samples.

UNIT V SOFT SKILLS: (9)

Time management – Articulateness – Assertiveness – Psychometrics – Innovation and Creativity -Stress Management & Poise -Video Samples.

B.TECH – COMPUTER SCIENCE ENGINEERING
Curriculum &Syllabus [Regulation BR (2014)](2014-15 Batch only)

SEMESTER I

Course Code	Course Name	L	T	P	C
THEORY					
U1GEB20	Engineering English - I	2	0	0	2
U1GEB21	Engineering Mathematics - I	3	1	0	4
U1GEB22	Engineering Physics - I	2	0	0	2
U1GEB23	Engineering Chemistry - I	2	0	0	2
U1GEB24	Principles of Electrical and Electronics Engineering	3	0	0	3
U1GEB25	Basics of Computing and C Programming	3	0	0	3
PRACTICAL					
U1GEB26	Engineering Physics and Chemistry Laboratory - I	0	0	4	2
U1GEB27	Principles of Electrical and Electronics Engineering Laboratory	0	0	3	2
U1GEB28	Computer Practices laboratory	0	0	3	2
Total		15	1	10	22

COURSE CODE: U1GEB20
COURSE NAME: ENGINEERING ENGLISH I

L	T	P	C
2	0	0	2

COURSE OBJECTIVES

Students undergoing this course are expected:

- To develop their basic communication skills in English
- To achieve specific linguistic and communicative competence
- To acquire relevant skills and function efficiently in a realistic working context
- To inculcate the habit of reading for pleasure

COURSE OUTCOMES

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

- Respond orally to the written works, grounding their ideas in the text.
- Formulate open-ended questions in order to explore a topic of interest
- Training to adhere in analytical and critical dialogue orally
- Engage in daily, meaningful reading tasks in English class and/or at home.
- Develop interpersonal skills on current problems and events

PRE-REQUISITES

Admission to B.Tech.Programme

COURSE CONTENTS

UNIT I TECHNICAL GRAMMAR **9**

Parts of Speech, Time, Tense and Aspect, Active and Passive Voice, WH Questions, Question Tag-Concord.

UNIT II INFORMATION SKILLS **9**

Letter writing, Formal and Informal letters, Transformation of information and Transcoding (Pie chart, bar chart & classification table), Process Description, Note taking, Note Making,Paragraph
Writing

UNIT III LANGUAGE OUTLINE **9**

Definitions and Extended Definitions, Hints Development, Checklist, Dialogue Writing, Report, its importance and Report Writing

UNIT IV LANGUAGE SKILLS **9**

Process of Communication and factors, Verbal and Non-verbal Communication, Listening Skills, Reading Skills, Speaking skills, Writing skills

UNIT V INTUITION SKILLS **9**

Creative thinking, Critical thinking, Discussion of current affairs and events and problems, Offering suggestions/ solutions/ sharing opinions.

TOTAL: 45 periods

TEXT BOOKS

1. Andera, J.Rutherford. Basic Communication Skills for Technology, Second edition, Pearson Education,2007
2. Butterfield, Jeff. Soft Skills for Everyone, Cegage learning, Canada,2011

REFERENCE BOOKSS

1. Bailey, Stephen. Academic Writing: A Practical Guide for Students. New York: Rutledge, 2011.
2. Morgan, David and Nicholas Regan. Take-Off: Technical English for Engineering. Garnet Publishing Limited. New York: Longman, 2008.
3. Ganesan. S, Persis Mary T &Subhashini.B. Communication in English, Himalaya Publishing House, Mumbai, 2009.
4. Pickett, Nell Ann, Ann A.Laster and Katherine E.Staples. Technical English: Writing, Reading and Speaking. New York: Longman, 2009.

COURSE CODE: U1GEB21
COURSE NAME: ENGINEERING MATHEMATICS-I

L	T	P	C
3	1	0	4

COURSE OBJECTIVES

- To develop the basic mathematical knowledge and computational skills of the students in the areas of applied mathematics.
- To develop the skills of the students in the areas of several variable Calculus, Matrices, and sequences and series.
- To serve as a pre-requisite mathematics course for post graduate courses, specialized studies and research.

COURSE OUTCOMES

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

- Calculate eigen-values and eigen-vectors, apply Caley-Hamilton theorem, and diagonalize of symmetric matrices and demonstrate the nature of quadratic forms.
- Discuss the convergence and divergence of sequence and series of real numbers using various tests.
- Demonstrate understanding of the derivatives of functions of several variables, viz., partial and total differentiation, and differentiation of implicit functions and optimize the functions of several variables using Hessian method and Lagrangian method.
- Evaluate double integration and triple integration using Cartesian, polar co-ordinates and the concept of Jacobian of transformation from one coordinate system to another coordinate system.
- Identify the improperness in integrals and evaluate the integrals using appropriate mathematical tools and how to apply beta and gamma integrals keeping improperness in mind.

PRE-REQUISITES

Admission to B.Tech. Programme

COURSE CONTENTS

UNIT I MATRICES **L- 9 + T-3**

Characteristic equation – Eigen-values and Eigen-vectors of a real matrix – Statement of Cayley- Hamilton theorem – Applications of Cayley-Hamilton theorem in finding the inverse of a non-singular matrix and the power of a square matrix – Diagonalization of symmetric matrices – Nature of Quadratic forms

UNIT II SEQUENCES AND SERIES **L- 9 + T-3**

Sequences – Convergence of series – Series of positive terms – Tests for convergence (n-th term, ratio, comparison, root and integral tests) and divergence - Leibnitz test for alternating series –Series of positive and negative terms - Absolute and conditional convergence– Power series – Taylor and Maclaurin series

UNIT III DIFFERENTIAL CALCULUS OF SEVERAL VARABLES L- 9 + T-3

Limits and continuity- Partial Derivatives – Total derivative – Differentiation of implicit functions – inverse functions – Jacobian – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers

UNIT IV INTEGRAL CALCULUS OF SEVERAL VARIABLES L- 9 + T-3

Double integrals- Change of order of integration – Double integrals in polar coordinates – Triple integrals – Area as a double integral – Volume as a triple integral

UNIT V IMPROPER INTEGRALS L- 9 + T-3

Meaning of improper integrals - Beta and Gamma functions – properties –Reduction formula for Γ(n) – Relation between gamma and beta functions - Evaluation of integrals using Beta and gamma functions – simple problems.

TOTAL: 45+15(Tutorial) = 60 periods

TEXT BOOKS

1. Grewal B.S., *Higher Engineering Mathematics*, Khanna Publishers, New Delhi, 41st Edition, 2011.
2. Jain R.K and Iyengar, S.R.K *Advanced Engineering Mathematics*, 3rd edition, Narosa Publishing House, 2009.

REFERENCE BOOKS

1. Adrian Banner. *The Calculus Lifesaver*, Princeton University Press, Princeton, USA, 2007.
2. Alan Jeffrey. *Advanced Engineering Mathematics*, Harcourt/Academic Press, New York, 2002.
3. Hyghes-Hallett, Gleason, McCallum et al. *Single Variable Calculus* (6th Edn) John Wiley and Sons New York, 2013.
4. Hyghes-Hallett, Gleason, McCallum et al. *Multivariable Variable Calculus* (6th Edn) John Wiley and Sons New York, 2013.
5. Dennis G. Zill , Warren S. Wright and Michael R.Cullen. *Advanced Engineering Mathematics* (4th Edn) Jones a& Bartlett Learning, Canada, 2011.
6. James Stewart. *Multivariate Calculus, Concepts and Contexts*. (3rd Edn) Thomson/Brooks/Cole, Canada, 2005.
7. John Bird. *Higher Engineering Mathematics*, (5th Edn) Elsevier , Burlington,USA, 2006.
8. K.A.Stroud and D.J.Booth. *Advanced Engineering Mathematics* (4th Edn) Palgrave/MacMillan, USA. 2003.
9. Soo T. Tan. *Single Variable Calculus*, Brooks/Cole, Cengage Learning, Belmont, USA, 2010.
10. Soo T. Tan. *Multivariable Calculus*, Brooks/Cole, Cengage Learning, Belmont, USA, 2010.
11. Duraipandian P, Udayabaskaran S and Karthikeyan T, *Engineering Mathematics* (I Year) Muhil Publishers, 2010.
12. Kreyszig, E. *Advanced Engineering Mathematics*, (9th Edn.), John Wiley and sons, New York 2005.
13. Peter O' Neil, *Advanced Engineering Mathematics*, Cengage Learning, Boston, USA, 2012.

COURSE CODE: U1GEB22
COURSE NAME: ENGINEERING PHYSICS – I

L	T	P	C
2	0	0	2

COURSE OBJECTIVES

- To understand the basic laws of physics and their applications in engineering and technology.
- To develop scientific temper and analytical capability.
- To solve various engineering problems.

COURSE OUTCOMES

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

1. Discuss the basic physics concepts and its applications in a day to day life; demonstrate the knowledge in ultrasonic applications and its importance.
2. Identify information to relate and apply the utilizations of the electron beams in modern technologies such as CRT, CRO etc.
3. Explain the basic understandings of the matter, crystal structure and its fundamental properties including crystal systems, Miller indices, and X-Ray production.
4. Demonstrate the conductivity nature of metals and the classification of the solids learned from The Band Theory of Solids.
5. Identify the importance of the widely used current technologies such as mobile phones, solar cells for which semiconductor technology is essential.

PRE-REQUISITES

Admission to B.Tech. Programme

COURSE CONTENTS

UNIT-I: Acoustics **8L + 1T** **9**

Introduction, sound waves - Pitch and Intensity. Reflection of sound waves, Sabine formula, absorption of sound, reverberation Theory. Ultrasonic's –Acoustic Grating – production - magnetostriction oscillator and piezoelectric oscillator, Properties and applications

UNIT -II: Electron Optics **8L + 1T** **9**

Introduction, Electron-refraction-Bethe's law, Electron Gun and Electron Lens, Cathode Ray Tube and Cathode Ray Oscilloscope, Cyclotron, Bainbridge Mass Spectrograph, Electron Microscope, Applications.

UNIT -III: Crystal structures and X-Rays **8L + 1T** **9**

Introduction, Space lattice, unit cell, lattice parameters, Bravais Lattice - Crystal systems. Characteristics of Unit cell. Miller indices of planes. X-Rays –production, Bragg's Law. Powder crystal method and rotating crystal method.

UNIT -IV: Band Theory of Solids **8L+ 1T** **9**

Introduction, Electrical conduction, conductivity, drift velocity, influence of external factors on conductivity. The Band Theory of solids, Energy Bands, Energy Gap. Classification of solids, Energy Band structure of a conductor.Fermi-Dirac distribution function and Fermi Energy. Energy Band structure of an Insulator and semiconductor.

UNIT -V: Semiconductors **8L+ 1T** **9**

Introduction, Types- Intrinsic and Extrinsic semiconductors. Intrinsic carriers-electron and hole concentrations. Fermi level in intrinsic carrier density, Conductivity, Doping of impurities-N-type and P-Type.Temperature variation-law of mass action-Charge neutrality condition- Fermi level in extrinsic semiconductor-Hall effect-Applications.

TOTAL: 45 periods

TEXT BOOKS

1. M.N. Avadhanulu and P.G. Kshirsagar ,A Text Book of Engineering Physics, S.CHAND and Co, 2012.
2. Gaur and Gupta, Engineering Physics , DhanpatRai publications, 2009

REFERENCE BOOKS

7. S.O.Pillai ,Solid State Physics,New age international publications, 2010.
8. M.Arumugam, Engineering Physics,Anuradha publications, 2009.
9. Charles Kittel ,Introduction to Solid State Physics ,Wiley India publications, 2009.
10. Introduction to Solids –L.Azaroff TMH,33rd Reprint 2009.
11. Materials Science and Engineering – William Calister – Wiley India- Sixth Edition 2009.

COURSE CODE: U1GEB23
Name of the Course: ENGINEERING CHEMISTRY-I

L	T	P	C
2	0	0	2

COURSE OBJECTIVES

Students undergoing this course are expected to be conversant with:

1. A sound knowledge on the principles of chemistry and its applications in industries as well as research oriented topics useful for project submision of all branches of engineering.
2. Various aspects and principles of water treatment, surface chemistry, fuels and combustion along with preparation and application of important engineering materials and polymers.
3. Development of scientific approach towards solving time bound theoretical and experimental problems and ability to work in a team both as members and leaders.

COURSE OUTCOMES

After completing first semester, students from all branches of engineering will:

1. Demonstrate knowledge on the design of boilers, conditioning methods and the various treatments of water for public use.
2. Demonstrate knowledge concerned with the various industrial applications of adsorption techniques.
3. Describe various aspects related to Engineering polymers and their application in industries, chemical compositions and uses.
4. Describe Engineering materials and their significance in the present day life.
5. Demonstrate knowledge on fuels, their manufacturing and analysis.

PRE-REQUISITES

Admission to B.Tech. Programme

COURSE CONTENTS

UNIT- I WATER TREATMENT AND TECHNOLOGY **9**

Introduction- Hardness-Types and estimation by EDTA method-Boiler feed water – requirements- disadvantages of using hard water in boilers- internal conditioning (phosphate, calgon and carbonate conditioning methods)-external conditioning method-demineralization process – desalination-reverse osmosis –Electrodialysis- Domestic water treatment.

UNIT–II SURFACE CHEMISTRY **9**

Introduction-types of adsorption-adsorption of gases on solids, solute from solution-adsorption isotherm- Freundlich and Langmuir adsorption isotherm- BET basics and industrial applications. Role of adsorbent in catalysis- ion exchange reaction-chromatography – role of activated carbon in pollution abatement of air and waste water-Industrial applications of adsorption

UNIT–III POLYMERS **9**

Polymer, Classification based on, origin, structure, chemical structure, Degree of polymerization - Types of polymerization – Thermosetting and Thermoplastic polymers and their applications- Molecular weight of the polymer-Number average, weight average by viscosity method.Glass transition temperature-Conducting polymer and Biopolymers-

Polymeric composites.

UNIT–IV MATERIALS CHEMISTRY **9**

Abrasives-Classification and properties, Refractories-Classification and properties, Lubricants- Classification and properties. Organic electronic materials-liquid crystals, non-linear optics and LED, Nano materials-Buckminister fullerenes, CNT'S(Single walled carbon nano tubes and Multi-walled carbon tubes), advantages and applications-Nano composites

UNIT–V FUEL AND COMBUSTION CHEMISTRY **9**

Classification, Characteristics of fuel, Comparison between Solid, liquid and gaseous fuels, Combustion processes-Bomb calorimeter -Calorific value: gross and net calorific values.Solid Fuels: Coal: Classification, Analysis: Proximate and Ultimate analysis of coal and their importance, Metallurgical coke: Properties, Manufacture by Otto Hoffman process. Synthetic Petrol: Fischer-Tropsch process and Bergius Process, Knocking and chemical structure, octane number and cetane number and their significance, Gaseous Fuels: Natural gas, artificial gas (water gas, producer gas, coal gas). Flue gas analysis – Orsat apparatus.

TOTAL: 45 periods

TEXT BOOKS

1. P.C.Jain and Monica Jain - "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi (2002).
2. S.S.Dara- "A Text book of Engineering Chemistry" S.Chand&Co.Ltd., New Delhi (2006).
3. A. Ravikrishnan– Engineering Chemistry, Sri Krishna Publication, Chennai.

REFERENCES BOOKS

1. B.K.Sharma - "Engineering Chemistry", Krishna Prakasan Media (P) Ltd., Meerut (2001)
2. B.Sivasankar - "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd. New Delhi (2008).
3. B.R.Puri, L.R. Sharma, S.Pathania - "Principles of physical Chemistry" (2000).

COURSE CODE: U1GEB24
COURSE NAME: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING

L	T	P	C
3	0	0	3

COURSE OBJECTIVES

- To make students understand about the basic laws, concepts and allied terminologies pertaining to D.C Circuits & magnetic circuits
- To impart knowledge to students regarding the fundamentals of alternating current Rules and associated terminologies and it's behavior with fundamental elements like resistance inductance and capacitance**.**
- To make student familiarize about the various basic ac & dc rotating machines and transformers.
- To make students familiarize about the basic knowledge in state solid electronic devices and digital logic gates.
- To make students aware about fundamental principles underlying the working of various communication systems, modulation procedure and spectral bands.

COURSE OUTCOMES

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

- Enumerate the basics of electric circuit elements , related terminologies and fundamental laws governing the operation and analysis of those circuits with DC sources and laws , and also concepts related to magnetic circuits.
- Develop knowledge about the concept of single phase alternating current ,it's generation and circuit behavior with basic elements like resistance, inductance, & capacitance.
- Cite the operating principles and identify various ac, dc machines and transformers.
- Illustrate common solid state devices & and access their characteristic and explain the basic of logic gates.
- Correlate & summarize the fundaments concepts behind electronic communication systems.

PRE-REQUISITES

Admission to B.Tech. Programme

COURSE CONTENTS

UNIT I - D.C.CIRCUITS &MAGNETIC CIRCUITS 9

Electrical quantities, Ohm's Law, Series and parallel combinations, Kirchhoff's laws, Node and Mesh Analysis - Star - Delta Transformation-Definition of MMF, Flux and reluctance – Leakage factor - Reluctances in series and parallel (series and parallel magnetic circuits) - Electromagnetic induction - Fleming's rule - Lenz's law - Faraday's laws

UNIT II - A.C.CIRCUITS 9

Sinusoidal functions - RMS (effective) and Average values- Phasor representation - J operator – sinusoidal excitation applied to purely resistive, inductive and capacitive circuits - RL, RC and RLC circuits- Introduction to three phase circuits.

UNIT III –ELECTRICAL MACHINES **9**

Definition of Electrical Machines-Principle and Operation Of Generator and Motor, types of DC and AC Machines, EMF equation of DC machines, Principle of Transformer, EMF equation of transformer-Principle of Induction Motor, Synchronous Motor

UNIT IV - BASIC ANALOG AND DIGITAL ELECTRONICS **9**

PN junction Diode - Rectifiers - Half wave and full wave rectifiers, Bipolar Junction Transistor - Characteristic of FET, MOSFET, Silicon Controlled Rectifiers and Triac - Basic Logic Gates- Universal Logic Gates

UNIT V - BASIC COMMUNICATION SYSTEMS **9**

Basic Communication systems- Advantages of digital system- Elements of communication system - Electromagnetic spectrum - Modulation concepts.

TOTAL: 45 periods

TEXT BOOKS

1. Mittle.B.N, AravindMittle, "Basic Electrical Engineering", Tata McGraw Hill", 2nd Edition. Sep 2005.
2. Theraja.B.L, "Fundamentals of Electrical Engineering and Electronics", S.Chand& Co., 1st Multicolor Edition, 2006 (Reprint 2009).
3. Sedha.R.S, A Text book of Applied electronics, 2nd Edition, S.Chand& company, 2005.
4. Bhattacharya.S.K and Renuvig, Principles of electronics, 3rd Edition, S.K.Kataria& Sons, 2002.

REFERENCE BOOKS

1. Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", PHI Learning Private Ltd, 2nd Edition, 2010.
2. Wadhwa.C.L, "Basic Electrical Engineering", New Age International, 4th Edition, 2007. (Reprint June 2010)
3. AbhijitChakrabarti, SudiptaNath&Chandan Kumar Chanda, "Basic Electrical Engineering", Tata McGraw Hill, 1st Edition, 2009.
4. T. Thyagarajan, ―Fundamentals of Electrical Engineering, SciTech Publications, 5th Edition, Reprint Jan 2010.

U1GEB25 BASICS OF COMPUTERS AND C PROGRAMMING

L	T	P	C
3	0	0	3

COURSE OBJECTIVES

Students undergoing this course are expected to:

- Learn the fundamentals of computer and information technology
- Learn the Problem solving techniques
- Learn the basics and syntax of C programming.
- Learn the basics of UNIX and LINUX

COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Describe the computer hardware and software and Internet terminologies	K2
CO2	Explain the different methods of problem solving skills	K2
CO3	Discuss the algorithm, pseudo code, flow chart for simple problems	K2
CO4	Write an expression using operators and explain the decision making in C	K2
CO5	Explain the syntax of Array, Function, Structure and Union in c	K2
CO6	Describe the concept of pointer and files	K2
CO7	Explain the concepts of UNIX and LINUX	K2
CO8	Apply the C programming concept to solve real world problems	K3

PRE REQUISITE

Higher Secondary Level Mathematics

COURSE CONTENTS

UNIT I BASICS OF COMPUTER AND INFORMATION TECHNOLOGY 10

Digital Computer Fundamentals–Block diagram of a computer–Components of a computer system–Applications of Computers–Hardware and Software definitions–Categories of Software–Booting–Installing and uninstalling Software–Software piracy–Software terminologies-Information Technology Basics–History of Internet–Internet Tools.

UNIT II PROBLEM SOLVING METHODOLOGY 8

Problem solving Techniques–Program–Program development cycle–Algorithm – Flow chart – Pseudo Code – Program control structures – Types and generation of programming languages – Development of algorithms for simple problems.

UNIT III INTRODUCTION TO C 9

Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operations – Decision Making - Branching and Looping.

UNIT-IV FUNCTIONS 9

Arrays- Character arrays and Strings - Defined Functions - Definition of Function– Declaration - Category of Functions - Nesting of Functions, Recursive, Structures and Unions, Enumeration and Typedef.

UNIT-V POINTERS, FILE MANAGEMENT AND OPERATING SYSTEM CONCEPTS 9

Pointers – File Management in C – Input / Output Operations on Files -The Preprocessor, Introduction to UNIX and LINUX programming.

Total: 45 Periods

TEXT BOOKS

1. Reema Thareja, Fundamentals of Computing & C Programming‖ Oxford University Press, 2012.
2. Ashok.N.Kamthane, Computer Programming‖, Fifth Edition Pearson Education, 2008.

REFERENCE BOOKS

1. P.Visu, R.Srinivasan and S.Koteeswaran, ―Fundamentals of Computing and Programming‖, Fourth Edition, Sri Krishna Publications, 2012.
2. E.Balagurusamy, ―Computing Fundamentals and C Programming‖, Tata McGraw-Hill,2008.
3. Richard Petersen, ―Linux: The Complete Reference‖, Sixth Edition, Tata McGraw-Hill,2007

COURSE CODE: U1GEB26
COURSE NAME: ENGINEERING PHYSICS AND CHEMISTRY LAB – I

L	T	P	C
0	0	4	2

ENGINEERING PHYSICS LAB – I
COURSE OBJECTIVES

- To impart skills in measurements and hand on operation
- To design and plan the experimental procedure and to record and process the results.
- To reach non trivial conclusions of significant of the experiments.

COURSE OUTCOMES
After the completion of the experiments in Physics lab, students will be able to

1. Relate and apply the moment of inertia of the disc.
2. Translate sensory input into physical tasks
3. Recognize standards to perform a skill or task correctly
4. Use standards to evaluate their own performance and make corrections.
5. Evaluate information based upon standards and criteria values.

COURSE CONTENTS
Torsional Pendulum
To determine the moment of inertia of the disc and the rigidity modulus of the wire by Torsional oscillations.

Newtons' Rings
To find the focal length of a lens by forming Newton's ring.

Laser Grating
(i) Determination of wavelength of Laser using Grating and Particle size determination
(ii) Determination of Numerical Aperture and Acceptance angle of an Optical Fibre

Ultrasonic Interferometer
Determination of Velocity of ultrasonic waves in a liquid and compressibility of the liquid.

Young's Modulus – Non-Uniform Bending
To determine Young's modulus of the material of the beam by Non uniform bending method.

U1GEB26 ENGINEERING CHEMISTRY LAB -1

COURSE OBJECTIVES

Students undergoing this course are expected to be conversant with basic titration set up and methodologies for determining strength, hardness and alkalinity of various unknown solutions and water samples.

COURSE OUTCOMES

After completing first semester, students from all branches of engineering will possess:

1. Gain acquaintance in the determination the amount of hardness and chloride in the various samples of water for general purpose and their use it industries involving boilers.
2. Skills in estimating acidity/alkalinity in given water samples.
3. Expertise in estimating dissolved oxygen in water samples.
4. Analytical skills in determining the molecular weight and degree of polymerization using Ostwald's viscometer.
5. Knowledge in quantitative analysis of the acid/base.

COURSE CONTENTS

LIST OF EXPERIMENTS

1. Estimation of hardness of Water by EDTA.
2. Determination of DO in water (Winkler's Method).
3. Estimation of Chloride in Water sample (Argentometric).
4. Conductometric precipitation titration using $BaCl_2$Vs Na_2 SO_4
5. Determination of molecular weight and degree of polymerization using Ostwald viscometer
6. Conductometric titration (mixture of acids and base).

Course Code: U1GEB27
Course Name: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING LAB

L	T	P	C
0	0	3	2

COURSE EDUCATIONAL OBJECTIVES

- To make students familiar about the various wiring methods and specific wiring like go down wiring.
- To make students familiar about practical measurements of few important electrical
- quantities
- To make students understand about basic electronic circuit components and their
- characteristics study
- To make students understand about the operation of CRO
- To make students understand about the various logic gates.

COURSE OUTCOMES

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

1. Reenact various wiring methods and how to make wiring of a godown.
2. Understand what a resistive load is , and will be able to measure few electrical quantities like voltage , current and apply the skill in real life situations.
3. Discriminate & recognize basic electronic circuit components and their characteristics study
4. Check the operation of CRO
5. Distinguish the various logic gates.

PRE-REQUISITES

Basic Electrical & Electronics concept covered in higher secondary level.

COURSE CONTENT

LIST OF EXPERIMENTS: CYCLE I

1. Study of basic electrical and electronic components.
2. Godown Wiring
3. Stair case wiring
4. Fluorescent lamp wiring.
5. Measurement of Electrical quantities (Voltage, current, power) using load

MODEL PRACTICAL EXAMINATION I CYCLE II

1. Characteristics of PN junction Diode.
2. Characteristics of BJT (any one configuration).
3. Characteristics of zener diode.
4. Study of CRO.
5. Verification of logic gates

TEXT BOOK

1. Theraja.B.L, "Fundamentals of Electrical Engineering and Electronics", S.Chand& Co., 1st Multicolor Edition, 2006 (Reprint 2009). 2. Sedha.R.S, A Text book of Applied electronics, 2nd Edition, S.Chand& company, 2005.

REFERENCE BOOKS

1. Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", PHI Learning Private Ltd, 2nd g, 2010.

Course Code: U1GEB28
Course Name: COMPUTER PRACTICE LABORATORY

L	T	P	C
0	0	3	2

COURSE OBJECTIVES

Students undergoing this course will be provided with:

- The concept of MS Word and MS Excel.
- The concept of C control structures and Functions
- The concept of C pointers and file systems

COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Develop a MS-Word document independently for the given requirements	K3,S3
CO2	Demonstrate usage of MS-Excel spread sheet independently for the given applications	K3,S3
CO3	Develop and implement the C program individually using control structures, arrays and string for the applications	K3, S3
CO4	Develop and implement the C program independently using pointers and files concept	K3, S3

PREREQUISITE

Higher Secondary Level Mathematics.

COURSE CONTENTS

1) Word Processing

a. Document creation, Text manipulation with Scientific notations.
b. Table creation, Table formatting and Conversion.
c. Mail merge and Letter preparation.
d. Drawing - flow Chart

2) Spread Sheet

- Chart - Line, XY, Bar and Pie.
- Formula - formula editor.
- Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
- S o r t i n g and Import / Export features

3. Find whether a given number is odd or even.
4. Find whether a given number is prime or not.
5. Design an arithmetic calculator using Switch-Case.

6. Find largest and smallest elements in an array.
7. Demonstrate Looping and Control structures.
8. Demonstrate the String functions.
9.Find a Factorial of a number of ranges between 1 to 41 using Recursive function.
10. Demonstrate the Structures and Unions for employee salary.
11. Perform pointer arithmetic Operations.
12. Program to develop student‘s information using file concept.

SEMESTER II

Course Code	Course Name	L	T	P	C
THEORY					
U2GEB29	Engineering English-II	2	0	0	2
U2GEB30	Engineering Mathematics –II	3	1	0	4
U2GEB31	Engineering Physics – II	2	0	0	2
U2GEB32	Engineering Chemistry – II	2	0	0	2
U2GEB33	Basics of Mechanical and Civil Engineering	3	0	0	3
U2GEB34	Engineering Graphics	3	1	0	4
PRACTICAL					
U2GEB37	Engineering Practice Lab	0	0	3	2
U2GEB35	Engineering Physics & Chemistry Laboratory-II	0	0	4	2
U2GEB36	Proficiency in English Lab - I	0	0	3	2
U2GEB38	Life Skills	1	0	0	1
Total		16	2	10	24

U2GEB29 ENGINEERING ENGLISH II

L	T	P	C
2	0	0	2

COURSE OBJECTIVES

Students undergoing this course are expected to:

- to build sentences without grammatical errors
- instill the competitiveness through presentation skills
- solve any critical situations using trouble shooting techniques
- encourage them to handle day -to-day tasks through soft skills
- inculcate the habit of reading for pleasure

COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Apply the grammatical knowledge in writing any given topic	K3
CO2	Write technical reports effectively	K3
CO3	Describe group discussions, presentations and interview processes	K2
CO4	Speak confidently in seminars, one on one interaction among the peer groups	K4
CO5	Analyze articles on a given topic with the knowledge of vocabulary skills	K4

PRE REQUISITE

Engineering English I

COURSE CONTENTS

Unit I General grammar **6**

Simple Compound & Complex Sentences-Reported Speech- Modal verbs Articles

Unit II Technical Grammar **6**

Conditionals—'If' Clauses-Connectives- Word Formation-Nominal Compounds

Unit III Academic communication **6**

SMS Communications- Email Communications- CV and Cover letter-Mini Project Writing

Unit IV Corporate Communication **6**

Presentation Skills -Group Discussion-Interview Skills

Unit V Soft Skills **6**

Personality Development -Persuasive Speech- Dealing with clients -Time -Management -Crisis management -Trouble Shooting.

Total: 30 Periods

TEXT BOOKS:

1. Andera, J.Rutherford**. Basic Communication Skills for Technology,** Second edition, Pearson Education, New Delhi2007
2. Butterfield, Jeff. **Soft Skills for Everyone,** Cegage learning**,** Canada, 2011

REFERENCE BOOKS

1. Ganesan.S, et al, **Communication in English**. Himalaya publishing house, Mumbai, 2009.
2. Pickett, Nell Ann, Ann A.Laster and Katherine E.Staples. **Technical English: Writing, Reading and Speaking.** New York: Longman, 2010.

U2GEB30 ENGINEERING MATHEMATICS – II

L	T	P	C
3	1	0	4

COURSE OBJECTIVES :

Students undergoing this course are expected to:

- Provide the knowledge of the areas of Vector Calculus, Integral Calculus, Complex variables, Laplace Transform and ordinary differential equations.
- Serve as a pre-requisite mathematics course for post graduate courses, specialized studies and research in any branch of engineering.

COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Apply Laplace transformation techniques to convert time-domain complex systems into simple frequency-domain algebraic equations and vice-versa.	K3
CO2	Apply the method of undetermined coefficients, method of variation of parameters and Laplace transform techniques to solve ordinary linear differential equations.	K3
CO3	Apply vector calculus to solve problems related to vector and scalar fields.	K3
CO4	Apply analytical functions in conformal mapping problems.	K3
CO5	Apply the calculus of residues in contour integration.	K3

PREREQUISITE

Engineering Knowledge of the topics covered in Engineering mathematics- I; complex numbers; vector algebra.

COURSE CONTENTS

UNIT I LAPLACE TRANSFORM L-9 + T-3

Laplace transform – Sufficient Condition for existence – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function and impulse functions – Transform of periodic functions - Inverse Laplace transform– Convolution theorem (excluding proof) – Initial and Final value theorems

UNIT II ORDINARY DIFFERENTIAL EQUATIONS L-9 +T-3

Introduction to higher order linear differential equations with constant coefficients –Method of undetermined coefficients - Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients – Solution of linear ODE of second order with constant coefficients using Laplace transform.

UNIT III VECTOR CALCULUS L-9 + T-3

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

UNIT IV ANALYTIC FUNCTIONS L-9 + T-3

Introduction to functions of a complex variable – Analytic functions – Necessary conditions, Cauchy – Riemann equation and Sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping : w= z+c, cz, 1/z, and bilinear transformation.

UNIT V COMPLEX INTEGRATION L- 9 + T-3

Introduction to complex integration – Statement and applications of Cauchy's integral theorem and Cauchy's integral formula (excluding proofs) – Taylor and Laurent expansions – Singular points – Residues – Residue theorem and simple problems – Application of residue theorem to evaluate real integrals –Unit circle and semi-circular contour(excluding poles on boundaries).

Total: 60 Periods

TEXT BOOKS

1. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, (2011).
2. Kreyszig E, Advanced Engineering Mathematics, 12th edition, Wiley, 2010.

REFERENCE BOOKS

1. Dean G. Duffy. Advanced Engineering Mathematics with MATLAB, 2ndEdn. Chapman & Hall / CRC Press. New York, 2003 (Taylor and Francis, e-library, 2009).
2. Jain. R. K and. Iyengar, S.R.K, Advanced Engineering Mathematics, 3rd edition, Narosa Publishing House, 2009.
3. Peter O' Neil, Advanced Engineering Mathematics, Cengage Learning, Boston, USA, 2012.

U2GEB31 ENGINEERING PHYSICS II

L	T	P	C
2	0	0	2

COURSE OBJECTIVES:

Students undergoing this course are expected to:

- Explain the role of photons in understanding phenomena such as Compton effect, Dual nature of mater and Quantum Theory.
- Give an insight into the principle of Laser operation and applications of Optical fibers in instrumentation
- Understand theory and the principles behind various superconductivity and its characteristics and applications.
- Develop fundamental Knowledge of Magnetic and Dielectric Materials and relate to use in device design
- Have a well founded knowledge of the unique properties of materials with nanoscale dimensions and to learn the new applications of nano materials in nanotechnology

COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain the wave-particle duality; concept of De-Broglie wavelength and its importance	K2
CO2	Discuss the property of Laser and optical fiber handling techniques and its application	K2
CO3	Discuss the superconducting phenomenon, their properties and concepts for various applications	K2
CO4	Differentiate various magnetic, dielectric materials for application in industries and medical field.	K2
CO5	Able to explain various methods involved in Synthesis of nano and smart materials through different techniques and their application in nano technology.	K2

PREREQUISITE

Basic theoretical knowledge in Atomic Physics, Lasers, Superconductivity, Electricity, Magnetism, and Engineering Physics I

COURSE CONTENTS

UNIT -I Atomic Physics 6

Black body radiation- ultraviolet catastrophe- Planck's Quantum hypothesis-Photoelectric effect- Measurement of K.E. of photoelectrons- stopping potential- Failures of Classical theory- Compton effect-Compton Theory-Dual nature of matter- DeBroglie Hypothesis-Davisson –Germer Experimen-, G.P. Thomson Experiment- Heisenberg's Uncertainty Principle (Statement only).

UNIT -II Lasers and Optical Fibers 6

Interaction of Radiation with Matter- Essentials of Laser-Types of Laser - Ruby Laser- He-Ne Laser- semiconductor Laser-Application of Lasers- Optical Fibers – Propagation of light through an optical fibers- Modes of Propagation- Types of optical fibers- Optical fiber communication system- Attenuation in fibers.

UNIT-III Superconductivity 6

Discovery of superconductivity- persistent currents- effect of external magnetic field- critical current density- Meissner effect- London penetration depth- BCS Theory descriptive- Type of superconductors- Josephson Effect (AC and DC) - Applications – Maglev-SQUIDS.

UNIT -IV Magnetic and Dielectric Materials 6

Magnetic Susceptibility-Magnetic materials (Dia, Para, Ferro & Antiferro)- Magnetic moment of atom-Hard and soft magnetic materials- Hysteresis curve – Applications. Dielectrics- Electronic, ionic, orientational and space polarizations – Internal fields in solids – Polarization-Induced dipoles-Nonpolar and Polar dielectrics - Clausius Mosotti equation-Dielectric loss.

UNIT -V Nanotechnology and Advanced Materials 6

Nano phase materials – Synthesis – Plasma arcing – chemical vapour deposition – Sol gel method – Electro deposition – Ball milling – properties and application – Carbon nano tubes – types.

Total: 30 Periods

TEXT BOOKS

1. M.N.Avadhanulu and P.G.Kshirsagar ,A Text Book of Engineering Physics, S.CHAND and Co,2012.
2. Gaur and Gupta, Engineering Physics , Dhanpat Rai publications,2009

REFERENCE BOOKS

1. T.Pradeep, The essential understanding –Nanoscience and Nanotechnology-TMH, 2010.
2. William D.Callister ,Materials Science and Engineering, John Wiley &Sons- 2010
3. Charles Kittel ,Introduction to Solid State Physics -Wiley India publications,2009.

U2GEB32 ENGINEERING CHEMISTRY II

L	T	P	C
2	0	0	2

COURSE OBJECTIVES

Students undergoing this course are expected to:

- Impart a sound knowledge on the principles of chemistry involving the different application oriented topics.
- Impart adequate knowledge about the principles of electrochemistry, alloys, corrosion and energy storage devices along with the spectroscopic technique to analyze the chemical compounds.
- Prepare the students to solve problems in electrochemistry.

COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain the phase rule and to appreciate the importance of alloys in the present day life.	K2
CO2	Explain the basic principles, laws of electrochemistry, solve simple problems and list various applications.	K2
CO3	Explain the various aspects of corrosion and its control	K2
CO4	Describe various energy sources and storage devices used in our daily life.	K2
CO5	Explain the basic principles of spectroscopic and microscopic techniques.	K2

PREREQUISITE

Engineering Chemistry I

COURSE CONTENTS

UNIT–I PHASE RULE AND ALLOYS 6

Statement and explanation of the terms involved- one component water system- condensed phase rule-construction of phase diagram by thermal analysis-simple eutectic systems (Lead-Silver system only)– Alloys - importance – ferrous alloys – Nichrome - stainless steel – non-ferrous alloys - brass and bronze.

UNIT–II ELECTROCHEMISTRY 6

Basics of conductance-Kohlarausch's Law-Effect of dilution-specific conductance and equivalence conductance. Electrochemical cells- reversible and irreversible cell- EMF measurement - single electrode potential- Nernst equation-problems-reference electrode-SHE-Calomel electrode-Glass electrode-measurement of p^H-electrochemical series-significance- potentiometric titration –Redox titration –conductometric titration.

UNIT–III CORROSION AND ITS CONTROL 6

Chemical corrosion – Pilling – Bedworth rule – electrochemical corrosion – different types – galvanic corrosion – differential aeration corrosion – factors influencing corrosion – corrosion control – sacrificial anode and impressed cathodic current methods – corrosion

inhibitors – protective coatings – paints – constituents and functions – metallic coatings – electroplating (Au) and electroless (Ni) plating.

UNIT–IV ENERGY SOURCES AND STORAGE DEVICES 6

Renewable and non renewable energy resources- nuclear fission- fusion-chain reaction-nuclear energy- nuclear reactor–light, heavy water nuclear power plant-Fast Breeder Reactor-wind energy- solar energy- tidal energy- primary and secondary batteries- lead acid- nickel cadmium-lithium ion battery-H_2-O_2 fuel cells.

UNIT–V SPECTROSCOPIC AND ANALYTICAL TECHNIQUES 6

Introduction- Electromagnetic radiation- interaction of electromagnetic radiation with matter-Beer- Lambert's law- principle, instrumentation(Block Diagram) and applications of UV-Visible spectroscopy, IR spectroscopy- colorimetry- flame photometry–AAS. Introduction to SEM and TEM.

TOTAL: 30 PERIODS

TEXT BOOKS

1. P.C.Jain and Monica Jain - "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi (2008).
2. A. Ravikrishnan– Engineering Chemistry, Sri Krishna Publication, Chennai (2012).

REFERENCE BOOKS

1. B.K.Sharma - "Engineering Chemistry", Krishna Prakasan Media (P) Ltd., Meerut (2001)
2. B.Sivasankar - "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd. New Delhi (2008).
3. B.R.Puri, L.R.Sharma, S.Pathania - "Principles of physical Chemistry " (2000).
4. William Kemp – "Organic spectroscopy" Macmillan publications (1991).
5. Peter Atkins, Julio de Paula "Physical Chemistry" W.H. Freeman publications (2009)

U2GEB33 BASIC MECHANICAL AND CIVIL ENGINEERING

L	T	P	C
3	0	0	3

COURSE OBJECTIVES

Students undergoing this course are expected to:

- Understand the concept of manufacturing processes and basic mechanical engineering.
- Impart knowledge on fundamentals of civil engineering.

COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Describe various manufacturing processes and working principle of power plant.	K2
CO2	Describe the working principles of combustion engines.	K2
CO3	Define the working principles of refrigeration and air conditioning systems.	K2
CO4	Explain the fundamentals of surveying and civil engineering materials.	K2
CO5	Describe building components and structures.	K2

PREREQUISITE

Engineering Practice Lab

COURSE CONTENTS

Unit I Manufacturing Processes and Introduction to Power plant 9

Introduction to Lathe – Drilling – Twist Drill Nomenclature – Shaper. Introduction to Metal Joining Processes - Welding processes - Arc & Gas welding - AC & DC welding equipments - Brazing and soldering. Introduction and classification of power plants – Working of thermal, hydroelectric and nuclear power plants.

Unit II Combustion Engines 9

Principle of Internal and external combustion engines – Petrol engine, diesel engine, working principle and comparison - Two stroke and four stroke of both CI & SI engines, working principle and comparison - Alternative fuels.

Unit III Refrigeration & Air-Conditioning System 9

Introduction to Refrigeration– Non cyclic & Cyclic Refrigeration - Principle of vapour compression refrigeration system - Applications. Air-Conditioning – Layout of typical domestic refrigerator – Window and Split type Air conditioner – Applications.

Unit IV surveying and civil engineering materials **9**

Surveying:

Introduction – Definition – Importance of surveying – Objectives of surveying – Principles of surveying – Types of surveying – Measurements of angles – Introduction to levelling – Types of levelling instruments.

Civil Engineering Materials:

Introduciton – Importance of civil engineering – construction materials – Bricks – Stones – Cement – Lime motor – Concrete.

Unit V Building Components and Structures **9**

Building Components:

Foundations – Objectives of foundations – Types of foundation – Requirements of good foundation.

Superstructure:

Introduction – Brick masonry – Masonry – RCC structure of members – Columns – Beams – Slabs – Lintels – Types of Roof – Trusses – Flooring – Roofing – Plastering. Components of bridges and dams.

TOTAL: 45 periods

TEXT BOOKS

1. P K Nag., - Basic Mechanical Engineering, Tata McGraw Hill Education, (2013).
2. K.V. Natarajan – Basic Civil Engineering, M/s Dhanalakshmi, Chennai - 2012

REFERENCE BOOKS

1. Rao P. N., Manufacturing Technology, 2nd Edition, Tata McGraw Hill Inc, New Delhi
2. Surendra Singh, ―Building Materials ", Vikas Publishing Company, New Delhi, 2006
3. Cambell J. S., Principles of Manufacturing Materials and Processes 14th Edition, Tata McGraw Hill, Inc, New Delhi, 2012

COURSE CODE: U2GEB34
COURSE NAME: ENGINEERING GRAPHICS

L	T	P	C
3	1	0	4

COURSE OBJECTIVES

- To familiarize the students in basic concept and necessity of conic sections, projections and developments of objects.
- To develop the imagination and drafting skills of students and let them understand the internal features of the object.

COURSE OUTCOMES

Students undergoing this course are able to

- Construct ellipse, parabola, hyperbola and draw free hand sketching of orthographic views.
- Construct orthographic projections of points, straight lines and planes.
- Construct projections of simple solids.
- Develop true sections and lateral surfaces of simple solids.
- Construct isometric and perspective projections of simple solids.

COURSE CONTENTS

UNIT I: CONIC SECTIONS AND FREE HAND SKETCHING 9+3

Construction of ellipse (concentric circle and eccentricity methods), construction of parabola (rectangle and eccentricity methods), construction of hyperbola (eccentricity method)

Free-hand sketching of orthographic views of pictorial views of solids – free-hand sketching of pictorial views of solids given the orthographic views.

UNIT II: PROJECTION OF POINTS, STRAIGHT LINES & PLANES 9+3

Orthographic projections of points, orthographic projections of straight lines located in the first quadrant only – determination of true lengths and true inclinations – orthographic projections of polygonal surface and circular lamina inclined to both reference planes.

UNIT III: PROJECTIONS OF SOLIDS 9+3

Projections of simple solids (prisms, pyramids, cylinder and cone) when the axis is inclined to one reference plane by change of position and change of reference line methods.

UNIT IV: SECTIONS OF SOLIDS & DEVELOPMENT OF SURFACES 9+3

Sections of solids (prisms, pyramids, cylinder and cone) in simple vertical position by using cutting plane inclined to one reference plane and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinder and cone – development of lateral surfaces of solids with cylindrical cutouts perpendicular to the axis.

UNIT V: ISOMETRIC & PERSPECTIVE PROJECTION 9+3

Principles of isometric projection - isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones – isometric view of combination of two simple solids. Perspective projection of prisms, pyramids and cylinder by visual ray method and vanishing points method.

TOTAL: 45+15(Tutorial) = 60 periods

TEXT BOOKS

1. K.V. Natarajan, A text Book of Engineering Graphics, Dhanalakshmi Publisher, Chennai – 42, 2009
2. Venugopal K. –Engineering Graphics, New Age International (P) Limited, 2002.

REFERENCE BOOKS

1. Warren J. Luzadder and Jon. M. Duff, - Fundamentals of Engineering Drawing, Prentice Hall of India Pvt., Ltd., Eleventh Edition, 2001.
2. B. Bhattacharyya, S.C. Bera, Engineering Graphics ., I.K. International Pvt Ltd., 2009
3. M.S. Kumar ., Engineering Graphics.,Dd Publications, 2008
4. Jeyapoovan.T., Vikas Publishing House Engineering Graphics with using Auto CAD,2007
5. BIS code: SP 46:2003 Engineering Drawing practice for Schools & Colleges.

U2GEB35 ENGINEERING PHYSICS AND CHEMISTRY LAB II
ENGINEERING PHYSICS LABORATORY II

L	T	P	C
0	0	4	2

COURSE OBJECTIVES

To impart skills for conducting experiments independently to determine,

- Band gap of a semi conductor
- Thermal conductivity of a bad conductor
- The wavelengths of different spectral lines derived from mercury vapor lamp and diffraction grating arrangement using normal incidence method.
- The Viscosity of a liquid by Poiseuille's method
- Young's modulus of the beam by Uniform Bending method

COURSE OUTCOMES

After the successful completion of the course in Engineering Physics lab -II, students will be able to individually and independently

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Conduct experiments independently to determine band gap of a semi conductor	K2,S3
CO2	Demonstrate the experiment independently to determine the thermal conductivity of a bad conductor.	K2,S3
CO3	Perform the diffraction grating experiment to determine the wavelength of spectral lines by mercury vapour lamp using normal incidence method	K2,S3
CO4	Calculate the Viscosity of a given liquid by conducting Poiseuille's experiment	K2,S3
CO5	Handle the travelling microscope to focus the pin and find the bending moment of a given beam practically	K2,S3

PREREQUISITE

It is necessary to have basic theoretical knowledge about semiconducting material, thermal conductivity, optic laws, viscosity and bending moment of the beam.

COURSE CONTENTS

1. **Band Gap**
   To determine the Band gap of a Semiconductor material by using Post office Box
2. **Lee' Disc**
   To determine the thermal conductivity of the bad conductor – Lee's Disc method
3. **Spectrometer Mercury lamp**
   To determine the wavelengths of different spectral lines derived from mercury vapor lamp using normal incidence method.
4. **Viscosity**
   To determine the Viscosity of a liquid by Poiseuille's method
5. **Young's Modulus – Non-Uniform Bending**
   To determine of young's modulus of the beam – Uniform Bending

U2GEB35 ENGINEERING PHYSICS AND CHEMISTRY LAB II

ENGINEERING CHEMISTRY LABORATORY II

COURSE OBJECTIVES

Students undergoing this course are expected to be conversant with basic knowledge about handling various instruments like conductometer, potentiometer and pH meter and determining strength of various unknown solutions using the same.

COURSE OUTCOMES

After completing first semester, students from all branches of engineering will possess:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Perform an experiment to estimate the amount of Copper in brass by EDTA titration method	K2, S3
CO2	Carry out Conductometric titration (Mixture of weak and strong acids Vs Strong base).	K2, S3
CO3	Perform Conductometric precipitation titration using $BaCl_2$Vs $Na_2\ SO_4$	K2, S3
CO4	Perform Potentiometric Titration (Fe^{2+} Vs $KMnO_4$ or $K_2Cr_2O_7$).	K2, S3
CO5	Perform and estimate the strength of HCl by pH meter (acid Vs base)	K2,S3
CO6	Perform the experiment using Spectrophotometer for estimationof Ferric iron	K2,S3

PREREQUISITE

Engineering Chemistry Laboratory-I.

CONTENTS

1. Estimation of Copper in brass by EDTA
2. Conductometric titration (Mixture of weak and strong acids Vs Strong base).
3. Conductometric precipitation titration using $BaCl_2$Vs $Na_2\ SO_4$
4. Potentiometric Titration (Fe^{2+} Vs $KMnO_4$ or $K_2Cr_2O_7$).
5. Determination of strength of HCl by pH meter (acid Vs base).
6. Estimationof Ferric iron by spectrophotometric method.

U2GEB36 PROFICIENCY IN ENGLISH LABORATORY I

L	T	P	C
0	0	3	2

COURSE OBJECTIVES

- To impart advanced skills of Technical Communication in English through Language Lab
- To enable the students to communicate confidently and competently in English Language in all spheres
- To familiarize the students with the sounds of English in a nutshell, particularly stress and intonation
- To enable the students to communicate in English language in all spheres

COURSE OUTCOMES

After the successful completion of this course students will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Pave a platform to understand the sounds of English language	K3
CO2	Use their vocabulary in framing sentences and statements	K5
CO3	Formulate open-ended questions in order to explore a topic of interest	K5
CO4	Engage themselves in Group Discussions and Presentation skills	K5
CO5	Embolden in public speaking and to affluent one on one interaction	K5

PREREQUISITE

Engineering English I.

CONTENTS

CYCLE-I

1. Phonetics
2. Rearranging the words into meaningful sentences
3. Find the Odd words out
4. Creative writing
5. Find out the word meanings
6. Find out different meanings with the help of prefixes and suffixes
7. Word Analogy
8. Spotting the errors

CYCLE –II

1. Extempore speech
2. Group Discussion
3. How to write a story with the visual
4. Presentation-1(Technical)
5. Presentation-2(Non- Technical)
6. Mock interviews

COURSE CODE: U2GEB37
COURSE NAME: ENGINEERING PRACTICE LABORATORY

L	T	P	C
0	0	3	2

COURSE OBJECTIVES

To educate the students in

- Plumbing tools – house hold plumbing fittings and Carpentry process – Carpentry tools, types of joints.
- Types of welding & tools.
- Types of machining and operations, machine tools, cutting tools (Lathe, Drilling).
- Sheet metal – definition, working tools, operations - forming & bending.

COURSE OUTCOMES

Students undergoing this course are able to

- Produce simple joints using arc and gas welding processes.
- Display skills to perform basic machining and sheet metal operations.
- Display skills to work in a team environment.
- Prepare simple plumbing line sketches and models for house hold pipe fittings.
- Exhibit simple carpentry skills using power tools.

COURSE CONTENTS

I CIVIL ENGINEERING PRACTICE

Plumbing Works:

a) Preparation of plumbing line sketches for
   i. Water supply line
   ii. Sewage works.

b) Basic pipe connections using valves, taps, couplings, unions, reducers, elbows and in house hold fitting.

Carpentry using Power Tools:

(a) Study of the joints in roofs, doors, windows and furniture.
(b) Hands-on-exercise: Power sawing, Power Planning and making various joints.

II MECHANICAL ENGINEERING PRACTICE

Welding:

(a) Arc welding practice – butt joints and lap joints.
(b) Gas welding practice – butt joints and lap joints.

Basic Machining:

(a) Simple Turning and Taper turning in lathe.
(b) Drilling Practice.

Sheet Metal Work:

(a) Forming & Bending:
(b) Model making – Trays, funnels, etc.

U2GEB38 LIFE SKILLS

L	T	P	C
1	0	0	1

COURSE OBJECTIVES

Students undergoing this course are expected to:

- Have an overview of core life skills and emotional intelligence for day to day management.
- Provide an outline of personal values and time management principles for success in life.
- Expose students to the significance of interpersonal relationships and techniques to maintain them.
- Provide an overview of the role of stress and its impact on individual behaviour and the techniques to manage them.
- Expose students to the process of decision making and its implementation.

COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Identify the core life skills and its implementation in career and development	A1, K2
CO2	Interpret the personal values and its importance for self-management	A1, K2
CO3	Show appropriate interpersonal skills required for effective management of life skills	A2, K2
CO4	Recognize the various causes and impacts of stress and the ways of coping with it	A3, K2
CO5	Display decision-making abilities for conflict resolution in daily life	A5, K2

PRE-REQUISITES

Basic awareness about self and interpersonal skills

COURSE CONTENTS

UNIT I INTRODUCTION TO LIFE SKILLS 3

Definition- Concept of Life Skills, Practical use of core skills in daily life - Definition of Emotional Intelligence- Knowing one's Emotions and Managing Emotions.

UNIT II BEHAVIOUR AND VALUES 3

Personal Values- Strengths- Self-confidence, self-assessment, self-reliance, self-discipline, determination, self-restraint, contentment, humility, compassion, gratitude, forgiveness. Social Responsibility - Time Management- Value of time, Weekly Planner to do list

UNIT III INTERPERSONAL SKILLS 3

Maintaining Interpersonal Relationships- Relationship with family and peers - Prosocial behaviour- Helping others, Motivation to help others-Empathy - Displaying optimism and enthusiasm.

UNIT IV STRESS MANAGEMENT 3

Definition of Stress- Causes of stress and its impact. Stress Management techniques Managing Emotions- Anger Management- Causes of aggression- Thinking and Behaving in a Positive way Sensitization to Substance Abuse

UNIT V DECISION MAKING AND PROBLEM SOLVING 3

Definition- Decision making. Necessity of Decision Making-Process of Decision Making Developing Alternatives, Evaluating Options, Implementing - Resolving Conflict- Steps for Conflict Resolution

Total: 15 Periods

TEXT BOOKS

1. Rajasekaran, G; Nair, Radhakrishnan, and Santhanam, Divya (Edtd) (2009); Facilitator's Manual on Enhancing Life Skill; Chennai, Rajiv Gandhi National Institute of Youth Development
2. Butterfield, Jeff (2010); Soft Skills for Everyone; Delhi: Cengage Learning India Private Ltd

REFERENCE BOOKS

1. Goleman, Daniel (1995); Emotional Intelligence: Why It Can Matter More Than IQ; Bantam Books.
2. Baron, Robert A; Byrne, Donn and Branscombe, Nyla R. (2006); Social Psychology; New Delhi: Pearson Education.

SEMESTER III

SUB.CODE	SUBJECTS	L	T	P	C
THEORY					
U3MAB01	Transforms And Partial Differential Equations	3	1	0	4
U3CSB01	Data Structures & Algorithms	3	0	0	3
U3CSB02	Digital Principles and system design	3	1	0	4
U3ITB18	Java Programming	3	0	0	3
U3CSB03	System Software	3	0	0	3
U3CSB04	Computer Organization and Architecture	3	0	0	3
PRACTICAL					
U3CSB05	Data Structures Lab	1	0	3	2
U3CSB06	Digital Lab	0	0	3	2
U3ITB01	J2SE – Core JAVA	0	0	3	2
Total Credits					26

Course Code: U3MAB01

Course Name: TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

L	T	P	C
3	1	0	4

Designed for: Year: II Semester: III

Course Educational Objectives:

Students undergoing this course are expected to:

- The Course Educational Objectives: is to develop the skills of the students in the areas of boundary value problems and transform techniques.
- This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory.
- The course will also serve as a prerequisite for post graduate and specialized studies and research.

Course Outcomes:

Students undergoing this course are able to

- Demonstrate the basic concepts in Fourier series, properties, parseval's identity.
- Apply the concepts of Fourier transform.
- Demonstrate the basic concepts in partial differential equations.
- Apply partial differential equation in engineering problems.
- Apply the concepts of Z-Transform in Digital Systems.

Course Content

UNIT I : Fourier Series **9 + 3**

Dirichlet's conditions – general Fourier series – odd and even functions – half range sine series – half range cosine series – complex form of Fourier series – Parseval's identity – harmonic analysis

UNIT II : Fourier Transforms **9 + 3**

Fourier integral theorem (without proof) – Fourier transform pair – sine and cosine transforms – properties – transforms of simple functions – convolution theorem – Parseval's identity

UNIT III : Partial Differential Equations **9 + 3**

Formation of partial difference equations – solutions of standard types of first order partial differential equations– Lagrange's linear equation – linear partial differential equations of second and higher order with constant coefficients

UNIT IV : Applications of Partial Differential Equations **9 + 3**

Solutions of one dimensional wave equation – one dimensional equation of heat conduction – steady state solution of two-dimensional equation of heat conduction (insulated edges excluded) – Fourier series solutions in Cartesian coordinates only.

UNIT V : Z-Transforms and Applications **9 + 3**

Z-Transforms – elementary properties – inverse Z-transform – convolution theorem – formation of difference equations – solution of difference equations using Z-transform

Text Books

1. B.S. Grewal, Higher Engineering Mathematics, 40th edition, Khanna Publishers, New Delhi, 2007.
2.E. Kreyszig, Advanced Engineering Mathematics, 8th edition, Wiley India, 2007.

Reference Books

1. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, 3rd edition, Narosa Publishing House, New Delhi, 2007.
2. H.K. Dass, Advanced Engineering Mathematics,20th edition, S. Chand & Co, New Delhi, 2007.

Online Resources

1. http://mathworld.wolfram.com/FourierSeries.html
2.http://www.fourier-series.com/
3.http://www.sosmath.com/fourier/fourier1/fourier1.html
4.http://mi.eng.cam.ac.uk/~rwp/Maths/vid09/l5notes.pdf
5.http://people.math.carleton.ca/~amingare/calculus/fourier-series.pdf
6.http://quasirandomideas.wordpress.com/2010/04/20/math2111-chapter-1-fourier-series-section-4-examples-and-general-periodic-functions/
7. http://www.stat.ucla.edu/~dinov/courses_students.dir/04/Spring/Stat233.dir/STAT233_notes.dir/FourierSeries.html
8. http://www.intmath.com/fourier-series/4-fourier-half-range-functions.php
9. http://www2.kau.se/yourshes/AB2_12.pdf
10. http://en.wikipedia.org/wiki/Half_range_Fourier_series
11. http://www.maths.qmul.ac.uk/~wjs/MTH5102/fourier10.pdf
12. hkumath.hku.hk/course/MATH2601/www2601/notes/2601ch4b.pdf
13. arxiv.org/pdf/0809.1643
14. www.physics.ohio-state.edu/~ntg/.../hjorth-jensen_notes2011_03.pdf
15. http://en.wikipedia.org/wiki/Numerical_methods_for_ordinary_differential_equations
16. www.math.ufl.edu/~kees/NumericalODE.pdf
17. people.maths.ox.ac.uk/suli/nsodes.pdf
18. www.efunda.com/math/num_ode/num_ode.cfm
19. http://cnyack.homestead.com/files/afourtr/ftcosin.htm
20. http://www.efunda.com/math/fourier_transform/index.cfm

L	T	P	C
3	0	0	3

Course Code: U3CSB01
Course Name: DATA STRUCTURES& ALGORITHMS
Designed for: Year: II Semester: III

Course Educational Objectives:

Students undergoing this course are expected:

- Be exposed to the concepts of ADTs
- Learn linear data structures – list, stack, and queue.
- Learn non-linear data structures – Tree, graph etc.
- Be exposed to sorting, searching, hashing algorithms

Course Outcomes

Students undergoing this course are able to:

- Identify user defined data types, linear data structures for solving real world problems.
- Write modular programs on non linear data structures and algorithms for solving engineering problems efficiently.
- Illustrate some of the special trees and Hashing Techniques.
- State what is an undirected graph, directed graph and apply BFS and DFS to traverse a graph
- Demonstrate knowledge of sorting algorithms and their run-time complexity

Pre-requisites

- Fundamentals of computing and Programming

Course Content

UNIT I: LINEAR DATA STRUCTURE **9**

Introduction - Time and space complexity analysis - Abstract Data Type (ADT) – The List ADT – Array Implementation – Linked List Implementation – Cursor Implementation – The Stack ADT – The Queue ADT – Applications of Stack, Queue and List.

UNIT II: TREES **9**

Introduction to trees - Tree Traversal - Binary Trees - Definitions – Expression Tree – Binary Tree Traversals - The Search Tree ADT – Binary Search Trees - AVL Tree.

UNIT III: SPECIAL TREES & HASHING **9**

Splay Tree – B-Tree - Priority Queue - Binary Heap – Threaded Binary Tree. Hashing - Separate Chaining – Open Addressing – Linear Probing – Quadratic Probing – Double Hashing –Rehashing

UNIT IV: GRAPH **9**

Introduction to Graphs - Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths –Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm- Kruskal's Algorithm – Breadth first search – Depth-First Search – Undirected Graphs – Biconnectivity.

UNIT V: SORTING & SEARCHING **9**

Sorting algorithm- Insertion sort- Selection sort- Shell sort-Bubble sort- Quick sort- Heap sort-Merge sort- Radix sort - Searching – Linear search - Binary search.

Learning Resources

Text Book

1. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Second Edition , Pearson Education, 2005.

Reference Books

1.A. V. Aho, J. E. Hopcroft, and J. D. Ullman, "Data Structures and Algorithms", Pearson Education, First Edition Reprint 2003.

2.R. F. Gilberg, B. A. Forouzan, "Data Structures", Second Edition, Thomson India Edition, 2005.

3.Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, "Fundamentals of Data Structure", Computer Science Press, 1995.

4. Jean-Paul Tremblay, "An introduction to data structures with applications", TMH

Online Resources

1.http://simplenotions.wordpress.com/2009/05/13/java-standard-data-structures-big-o-notation/

2.http://mathworld.wolfram.com/DataStructure.html/

LEARNING AND TEACHING ACTIVITIES:

Learning and Teaching Modes:

This course relies on lectures to guide through the material, tutorial classes to provide students with class, and a sequence of written and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

Course Code: U3CSB02
Course Name: DIGITAL PRINCIPLES AND SYSTEM DESIGN
Designed for: Year: II Semester: III

L	T	P	C
3	1	0	4

Course Educational Objectives:
Students undergoing this course are expected

- To introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions
- To introduce the methods for simplifying Boolean expressions
- To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits
- To introduce the concept of memories and programmable logic devices.
- To illustrate the concept of synchronous and asynchronous sequential circuits

Course Outcomes:
Students undergoing this course are able to:

- Apply knowledge of number systems, codes and Boolean algebra to the analysis and design of logic circuits.
- Identify, formulate and solve engineering problems in the area of digital logic circuits design
- Use the techniques, skills and modern engineering tools such as logic works and HDL which is necessary for engineering practice.
- Use flip-flops in designing sequential logic circuits
- Analysis Asynchronous Sequential circuits and Counters for digital circuits.

Link to other courses:

- Theory of Computation
- Discrete Mathematics
- Microprocessors and Microcontrollers
- Computer Organization and Architecture

Course Content:

UNIT I: INTRODUCTION TO NUMBER SYSTEM AND BOOLEAN FUNCTION 9 +3

Introduction to Number Systems – Binary Arithmetic – Binary Codes – Weighted and non-weighted - Logic gates - Boolean Algebra and Theorems – Boolean Functions – Simplification of Boolean Functions using Karnaugh Map and Tabulation Methods – Logic Gates.

UNIT II : DESIGN OF COMBINATIONAL CIRCUITS 9+3

Combinational circuits – Analysis and design procedures – Circuits for arithmetic operations – Code conversion – introduction to HDL.

UNIT III: DESIGN OF COMBINATIONAL CIRCUITS WITH MSI DEVICE 9+3

Decoders and Encoders – Multiplexers and Demultiplexers -Memory - Programmable Logic HDL for Combinational Circuits – HDL Verilog

UNIT IV: SYNCHRONOUS SEQUENTIAL LOGIC 9+3

Sequential Circuits – Flip Flops (SR, D, JK, T and Master-Slave) - Triggering of flip-flops – Analysis and Design Procedures – State Reduction and State Assignment – Shift Registers – Counters – HDL for Sequential Logic Circuits.

UNIT V: ASYNCHRONOUS SEQUENTIAL LOGIC 9+3

Analysis and design of asynchronous sequential circuits – reduction of state and flow tables – race free state assignment – hazards. Counters - Design procedure - Ripple counters - BCD and Binary - Synchronous counters.

Learning Resources

Text Book

1. M. Morris Mano, “Digital Design”, IV edition, Pearson Education, 2006.

Reference Books

1. Charles H.Roth Jr, “Fundamentals of Logic Design”, V edition – Jaico Publishing House, Mumbai,2003.
2. Donald D. Givone, “Digital Principles and Design”, Tata MCGraw Hill, 2003.
3. W.H.GOTHMANN, "Digital Electronics - An Introduction to Theory and Practice", Prentice Hall of India, 2000

Online Resources

1. onlinevt.blogspot.com/.../cs-2202-digital-principles-and-system.html/
2. www.tmhshop.com/digital-principles-and-system-design

LEARNING AND TEACHING ACTIVITIES:

Learning and Teaching Modes:

This course relies on lectures to guide through the material, tutorial classes to provide students with class, and a sequence of written and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

Course Code: U3ITB18
Course Name: JAVA PROGRAMMING
Designed for: Year: II Semester: III

L	T	P	C
3	0	0	3

Course Educational Objectives:

Students undergoing this course are expected to:

- Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- Be aware of the important topics and principles of software development.
- Have the ability to write a computer program to solve specified problems.
- Be able to use the Java SDK environment to create, debug and run simple Java programs..

Course Outcomes:

Students undergoing this course are able to:

- Design and implement basic data types and control flow constructs using J2SE or other Integrated Development Environments.
- Write, compile and execute Java programs using object oriented class structures with parameters, constructors, and utility and calculations methods, including inheritance, test classes and exception handling.
- Demonstrate multitasking using Threads.
- Develop simple applications using GUIs and event driven programming.
- Develop applets for inclusion in web pages; applets to access enterprise data bases in robust, enterprise applications

Link to Other Courses:

- Enterprises java webservices
- C# and Dot Net Lab
- ASP Dot Net Lab
- Enterprises java webservices Lab

Course content:

UNIT I: INTRODUCTION TO JAVA **11**

Basic concepts of object oriented programming, Instruction about Simple java program, Java vs C++,Tokens ,Keywords , Identifiers, Data types , Type Conversions and Casting, Arrays and Operators, Control statements, Class fundamentals, Declaring Objects, Assigning Object Reference Variables, introducing methods, constructors , this keyword, garbage Collection and finalize (),overloading methods, objects as parameters, returning objects, access control , static, final, command line arguments

UNIT II: INHERITANCE AND PACKAGE **9**

Nested and Inner Classes, Basics of Inheritance, Super keyword, Multilevel Hierarchy, Invoking Constructors, Method overriding, Abstract Classes, Using Final with Inheritance, Packages, Access Protection, Importing a Packages, Interfaces, Special String Operations and Character Extraction, String Comparison and Modifying a String, String Buffer.

UNIT III: EXCEPTIONS AND THREADS **7**

Exception Types, Uncaught Exceptions, Using Try Catch, Multiple Catch, Nested Try and throw, Throws, finally, Built in Exceptions, Using Exceptions, Threads- Thread creation, Life cycle of Threads, Thread priority, Thread Scheduling and Thread Synchronization.

UNIT IV: I/O STREAMS AND APPLET **9**

Character Streams, Stream I/O, Serialization, Files, Applet Architecture, Skeleton, Simple Applet Display Methods and HTML APPLET tag, Passing Parameters to the Applet, Event Handling-Delegation event Model-Event Classes-Event Listener Interface-java swings – swing components – Look and Feel.

UNIT V: JAVA NETWORKING AND JDBC **9**

InetAddress –TCP/IP Client socket – URL Connection –TCP/IP Server - socket – Datagram, JDBC-Introduction about JDBC,JDBC Drivers, Database connectivity in Java- Introduction to Design patterns – Creational, Structural and Behavioural Patterns - Casestudy.

Learning Resources

Text Books

1. Patric Naughton , Herbert Schildt, The Complete Reference “Java 2 “,Third edition Tata Mc Graw Hills ,2012.
2. Sachin malhotra, ”Programming in JAVA”, Oxford University Press, 2010.

Reference Books

1. H.M.Deitel and P.J.Deitel –“**Java How to Program**” Pearson Prentice Hall Sixth Edition, 2009.
2. E. Balaguruswamy,*Programming in java* , Second Edition,TMH,1999.
3. Graham Hamilton, Rick Cattell, Maydene Fisher ,”*JDBC Database access with java*”-1997
4. Bruce Eckel – “**Thinking in Java**” Pearson Prentice Hall Third Edition-2006

Online Resources

1. docs.oracle.com/javaee/6/tutorial/doc/girgm.html
2. www.webreference.com/programming/java.html
3. www.apl.jhu.edu/~hall/java/Documentation.html

LEARNING AND TEACHING ACTIVITIES:

Learning and Teaching Modes:

This course relies on lectures to guide through the material, tutorial classes to provide students with class, and a sequence of written and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

Assessment Details:

Item	Scheduled on	Weightage	Cumulative Weightage
Assignment 1	2nd week	2%	2%
Assignment 2	5th Week	2%	4%
Cycle Test – I	6th Week	6%	10%
Assignment 3	8th Week	2%	12%
Assignment 4	10th Week	2%	14%
Cycle Test – II	11th Week	6%	20%
Assignment 5	13th Week	2%	22%
Model Exam	15th Week	13%	35%
Attendance	Face to Face	5%	40%
University Exam	18th Week	60%	100%

1. All written assignments are to be submitted at the designated time and place.
2. Late assignment will not be accepted without a proper reason.
3. Evaluated assignments will be returned within a week.

Course Code: U3CSB03
Course Name: SYSTEM SOFTWARE
Designed for: Year: II Semester: III

L	T	P	C
3	0	0	3

Course Educational Objectives:

Students undergoing this course are expected:

- To understand the relationship between system software and machine architecture.
- To know the design and implementation of assemblers
- To know the design and implementation of linkers and loaders.
- To have an understanding of macro processors.

Course Outcomes:

Students undergoing this course are able to:

- Solve major tasks of the system software of a computer system, focusing on internal working of the hardware and software interface of a typical system.
- Discuss and explain the working of Assemblers
- Illustrate the working of system software such as compilers, linkers, loaders.
- Explain and demonstrate macroprocessors
- Demonstrate Editing and debugging Tools.

Link to other courses:

- Microprocessor and Microcontroller

Course Content:

UNIT I : INTRODUCTION **9**

System software and machine architecture – The Simplified Instructional Computer (SIC) Standard Model and XE-Version - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II: ASSEMBLER **9**

Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures - Machine dependent assembler features - Instruction formats and addressing modes – Program relocation - Machine independent assembler features -Literals – Symbol-defining statements – Expressions - One pass assemblers and Multi pass assemblers - Implementation example -MASM assembler.

UNIT III : LOADER AND LINKER **9**

Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search – Loader Options - Loader design options - Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation example - MSDOS linker.

UNIT IV : MACRO PROCESSOR **9**

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters-Macro within Macro-Implementation example - MASM Macro Processor – ANSI C Macro language.

UNIT V: SYSTEM SOFTWARE TOOLS **9**

Text editors -Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems **-** Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

Learning Resources:

TEXT BOOK

1.Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2006.

REFERENCE BOOKS

1. Donovan "Systems Programming", Tata McGraw-Hill Edition, 2000.
2. John R D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 2002.
3. John J.. Levine, Linkers & Loaders – Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, 2000.

ONLINE RESOURCES

1. www.edunotes.in/system-software-notes
2. www.faadooengineers.com/.../7960-System-Software-Ebook-Notes-p...

LEARNING AND TEACHING ACTIVITIES:

Learning and Teaching Modes:

This course relies on lectures to guide through the material, tutorial classes to provide students with class, and a sequence of written and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

Course Code: U3CSB04

L	T	P	C
3	0	0	3

Course Name: COMPUTER ORGANIZATION AND ARCHITECTURE

Designed for: Year: II Semester: III

Credits: 3

Course Educational Objectives:

Students undergoing this course are expected

- To understand the hardware-software interface.
- To familiarize the students with arithmetic and logic unit and implementation of fixed point and floating-point arithmetic operations.
- To expose the students to the concept of pipelining.
- To familiarize the students with hierarchical memory system including cache memories and virtual memory.
- To expose the students with different ways of communicating with I/O devices and standard I/O interfaces.

Course Outcomes:

Students undergoing this course are expected to

- Explain about the basics, instruction set and addressing modes of a computer.
- Demonstrate computer arithmetic operations.
- Design and analyze pipeline for consistent execution of instructions with hazards.
- Conceptualize Instruction Level parallelism.
- Demonstrate knowledge about state-of-the-art I/O, memory and storage systems

Pre-requisites:

- Fundamentals of computing and Programming

5Course Content:

UNIT I: OVERVIEW & INSTRUCTIONS 9

Eight ideas – Components of a computer system – Technology – Performance – Power wall – Uniprocessors to multiprocessors; Instructions – operations and operands – representing instructions – Logical operations – control operations – Addressing and addressing modes.

UNIT II : ARITHMETIC OPERATIONS 7

ALU - Addition and subtraction – Multiplication – Division – Floating Point operations – Subword parallelism.

UNIT III : PROCESSOR AND CONTROL UNIT 11

Basic MIPS implementation – Building datapath – Control Implementation scheme – Pipelining – Pipelined datapath and control – Handling Data hazards & Control hazards – Exceptions.

UNIT IV: PARALLELISM **9**

Instruction-level-parallelism – Parallel processing challenges – Flynn's classification – Hardware multithreading – Multicore processors

UNIT V: MEMORY AND I/O SYSTEMS **9**

Memory hierarchy - Memory technologies – Cache basics – Measuring and improving cache performance - Virtual memory, TLBs - Input/output system, programmed I/O, DMA and interrupts, I/O processors.

Learning Resources

Text Books:

1. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software interface", Fourth Edition, Elsevier, 2011.
2. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, Tata McGraw Hill, 2002.

Reference Books:

1 M.Morris Mano, "Computer System Architecture"- Third Edition, Pearson Education, 2007.

2.Behrooz Parhami, "Computer Architecture", Oxford University Press, 2007.

3. V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", Second Edition, Pearson Education, 2004.

4,William Stallings, "Computer Organization and Architecture – Designing for Performance", Sixth Edition, Pearson Education, 2003.

5. John P. Hayes, "Computer Architecture and Organization", Third Edition, Tata McGraw Hill, 1998.

Online Resources:

1. WWW Computer Architecture Home Page
2. ACM Special Interest Group on Computer
3. IEEE Technical Committee on Computer Architecture
4. williamstallings.com/Computer Organization/COA8e-Instructor/

LEARNING AND TEACHING ACTIVITIES:

Learning and Teaching Modes:

This course relies on lectures to guide through the material, tutorial classes to provide students with class, and a sequence of written and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

Course Code: U3CSB05
Course Name: DATA STRUCTURES LAB
Designed for: Year: II Semester: III
Credits:2

L	T	P	C
1	0	3	2

Course Educational Objectives:

Students undergoing this course are expected to

- Be familiarized with good programming design methods, particularly Top-Down design.
- Getting exposure in implementing the different data structures using C++
- Appreciate recursive algorithms.

Course Outcomes:

Students undergoing this course are able to

- Design and implement C++ programs for manipulating stacks, queues, linked lists, trees.
- Apply good programming design methods for program development.
- Apply the different data structures for implementing solutions to practical problems.
- Develop recursive programs.
- Develop Programs for Searching and Sorting.
-

Link to other Courses:

- Compiler Design Lab
- Network Lab

Course Content

UNIT I : OBJECT ORIENTED PROGRAMMING FUNDAMENTALS

C++ Programming features - Data Abstraction - Encapsulation - class - object - constructors – static members – constant members – member functions – pointers – references - Role of this pointer – Storage classes – function as arguments.

UNIT II: OBJECT ORIENTED PROGRAMMING CONCEPTS

String Handling – Copy Constructor - Polymorphism – compile time and run time polymorphisms – function overloading – operators overloading – dynamic memory allocation - Nested classes - Inheritance – virtual functions.

LIST OF EXPERIMENTS:

CYCLE I

1. Implementation of Constructors & Destructors, Copy Constructor.
2. Implementation of Inheritance.
3. Implementation of Polymorphism& Function Overloading.
4. Implementation of Virtual Functions.

5. Implementation of Overload Unary & Binary Operators Both as Member Function & Non Member Function.
6. Implementation of Stack using Array
7. Implementation of Queue using Array
8. Implementation of linked list

MODEL PRACTICAL EXAMINATION I

CYCLE II

9. Implementation of stack using linked list
10. Infix to postfix conversion
11. Evaluation of postfix expression
12. Implementation of Binary Search Tree
13. Implementation of Breadth First Search and Depth First Search
14. Insertion Sort and Bubble Sort
15. Heap Sort
16. Quick Sort
17. Linear and Binary Search.

MODEL PRACTICAL EXAMINATION II

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

Standalone desktops with C/C++ complier 30 Nos.

(or)

Server with C/C++ compiler supporting 30 terminals or more.

Learning Resources

Text Book

1. M. A. Weiss, “Data Structures and Algorithm Analysis in C”, Second Edition , Pearson Education, 2005.

Reference Books

1. V. Aho, J. E. Hopcroft, and J. D. Ullman, “Data Structures and Algorithms”, Pearson Education, First Edition Reprint 2003.
2. R. F. Gilberg, B. A. Forouzan, “Data Structures”, Second Edition, Thomson India Edition, 2005.
3. Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, “Fundamentals of Data Structure”, Computer Science Press, 1995.

Online Resources

1. Learn C/C++ Today
2. Addison Wesley's Computer and Engineering Book Catalog and Programming Codes
3. CSE's ACM Programming Contest Homepage
4. Programming C under Linux, provided by RedHat
5. Sorting Algorithm Animation Demo

6. Analysis of Algorithms Home Page
7. Mathematical Programming Glossary
8. Algorithm Animation Links

LEARNING AND TEACHING ACTIVITIES:
Learning and Teaching Modes:

This course relies on practical to guide and provide students with class, and a sequence of modal practical and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

Course Code: U3CSB06
Course Name: DIGITAL LAB

L	T	P	C
0	0	3	2

Designed for: Year: II Semester: III
Credits:2

Course Educational Objectives:

Students undergoing this course are expected to

- Understand the various logic gates.
- Be familiar with various combinational circuits.
- Understand the various components used in the design of digital computers.
- Be exposed to sequential circuits
- Learn to use HDL

Course outcomes:

Students undergoing this course are able to

- Use boolean simplification techniques to design a combinational hardware circuit.
- Design and Implement combinational and sequential circuits.
- Analyze a given digital circuit – combinational and sequential.
- Design the different functional units in a digital computer system.
- Design and Implement a simple digital system.

Course Content

LIST OF EXPERIMENTS:

CYCLE I

1. Verification of Boolean theorems using digital logic gates.
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices.
4. Design and implementation of Ternary Logic gates.
5. Design and implementation of parity generator / checker using basic gates and MSI devices.

MODEL PRACTICAL EXAMINATION I

CYCLE II

6. Design and implementation of magnitude comparator.
7. Design and implementation of application using multiplexers.
8. Design and implementation of Shift registers.
9. Design and implementation of Synchronous and Asynchronous counters.
10. Coding combinational circuits using Hardware Description Language (HDL software required).
11. Coding sequential circuits using HDL (HDL software required).

MODEL PRACTICAL EXAMINATION II

LABORATORY REQUIREMENT FOR BATCH OF 30 STUDENTS
HARDWARE:
1. Digital trainer kits 30
2. Digital ICs required for the experiments in sufficient numbers 96

SOFTWARE:
1. HDL simulator.

Learning Resources
Text Book

1.M. Morris Mano, “Digital Design”, IV edition, Pearson Education, 2006.

Reference Books

1. Charles H.Roth Jr, “Fundamentals of Logic Design”, V edition – Jaico Publishing House, Mumbai,2003.
2. Donald D. Givone, “Digital Principles and Design”, Tata MCGraw Hill, 2003.
3. W.H.GOTHMANN, "Digital Electronics - An Introduction to Theory and Practice", Prentice Hall of India, 2000

Online Resources

1. onlinevt.blogspot.com/.../cs-2202-digital-principles-and-system.html/
2. www.tmhshop.com/digital-principles-and-system-design

LEARNING AND TEACHING ACTIVITIES:
Learning and Teaching Modes:

This course relies on practical to guide and provide students with class, and a sequence of modal practicals and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

Course Code: U3ITB01
Course Name: J2SE – Core JAVA LAB
Designed for: Year: II Semester: III
Credits: 2

L	T	P	C
0	0	3	2

Course Educational Objectives:
Students undergoing this course are expected

- To learn the basics of core Java programming concepts like native code interface, threads, etc.
- To develop network programs in Java
- To understand Concepts needed for distributed and multi-tier applications
- To understand issues in enterprise applications development.

Course Outcomes:
Students undergoing this course are able

- Write a java program using classes, methods, Objects and control structures.
- Implement inheritance, interfaces and packages in various application.
- Develop simple applications for handling pre-defined and user defined exceptions.
- Develop simple applications using GUIs and event driven programming.
- Construct an application using JDBC.

Course Content:

LIST OF EXPERIMENTS:
CYCLE I
1. Simple Java applications
   - for understanding reference to an instance of a class (object), methods
   - Handling Strings in Java
2. Looping & Conditional Statements.
3. Constructors
   -Implement constructor overloading.
4. Inheritance
   - To Implement Method Overloading and Method Overriding.
5. Package creation.
   - Developing user defined packages in Java
6. Interfaces
   - Developing user-defined interfaces and implementation
   - Use of predefined interfaces

MODEL PRACTICAL EXAMINATION I

CYCLE II

7. Threading
   - Creation of thread in Java applications
   - Multithreading
8. Exception Handling Mechanism in Java
   - Handling pre-defined exceptions

- Handling user-defined exceptions

9. Synchronization Techniques
   - To implement Deadlock Detection and Deadlock Avoidance
10. AWT -To Create Different Layout Managers.

11. Write a code for Java Swing component like JFrame, JLabel, JComponent, JList.

12. JDBC-To connect Oracle/MS Access for Table creation and Data Manipulation.

MODEL PRACTICAL EXAMINATION II

Learning Resources

Text Book

1. Herbert Schildt – "Java The Complete Reference" Tata McGrawHill Fifth Edition 2005.

Reference Books

1. E.BalaGurusamy – " Programming in Java" Tata McGrawHill Second Edition
2. H.M.Deitel and P.J.Deitel –"Java How to Program" Pearson Prentice Hall Sixth Edition
3. Bruce Eckel – "Thinking in Java" Pearson Prentice Hall Third Edition

Online Resources

http://www.tutorialspoint.com/java/
http://wp.mykau.com/wp-content/uploads/2010/06/cpit305-lab-manual.pdf

SEMESTER IV

SUB.CODE	SUBJECTS	L	T	P	C
THEORY					
U4MAB05	Probability and Queuing Theory	3	1	0	4
U4CSB07	Design and Analysis of Algorithms	3	1	0	4
U4CSB08	Theory of Computation	3	0	0	3
U4ECB14	Microprocessors & Microcontrollers	3	0	0	3
U4CSB09	Database management System	3	0	0	3
U4CSB10	Operating System	3	0	0	3
PRACTICAL					
U4CSB11	Operating System Lab	0	0	3	2
U4ECB17	Microprocessors and Microcontrollers Lab	0	0	3	2
U4CSB12	Database Management System Lab	0	0	3	2
Total Credits					25

L – Lecture; T – Tutorial; P – Practical; C – Credit

Course Code :U4MAB05
Course Name: Probability And Queuing Theory

L	T	P	C
3	1	0	4

Course Educational Objectives :

- Providing the students with fundamental knowledge of basic probability theory.
- Equipping the students with a fair knowledge of standard distributions with application to real life phenomena.
- Preparing the students to handle situations involving two or more random variables and functions of random variables.
- Enabling the students to model the phenomena which evolve with respect to time (discrete or continuous) in a probabilistic manner.
- Exposing to the students the basics and applications of white noise, telegraph processes in communication engineering.
- Developing skills in the students to model and analyse queuing problems in computer science and engineering.

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Determine the probability distributions of different types of random variables and work binomial, Poisson, geometric, uniform, exponential, normal distribution and their statistical measures.	K3
CO2	Calculate Probabilities, correlation co-efficient and regression lines of two dimensional random variables.	K2
CO3	Identify the nature of the process namely Markov and Poisson processes and calculate Stationary and transition probabilities.	K3
CO4	Apply the concept of Markovian Queueing models for obtaining measures of performance of real-time problems under steady state conditions.	K3
CO5	Apply the concept of non-Markovian queues and networks of queues for obtaining measures of performance of real-time problems under steady state conditions.	K3

Prerequisite:

- Mathematics-I
- Mathematics-II
- Transforms and partial differential equations
- Basic probability concepts.

Course Content :

UNIT I ONE DIMENSIONAL RANDOM VARIABLES L- 9 + T-3

Discrete and continuous random variables – moments – moment generating functions and their properties – binomial, Poisson, geometric, uniform, exponential, normal distributions.

UNIT II TWO DIMENSIONAL RANDOM VARIABLES L- 9 + T-3

Joint distributions – marginal and conditional distributions – covariance – correlation and regression – transformation of random variables – central limit theorem (for IID random variables)

UNIT III MARKOV PROCESSES AND MARKOV CHAINS L- 9 + T-3

Classification – stationary process (wide sense and strict sense) – Markov process – Markov chains – transition probabilities – limiting distributions – Poisson process.

UNIT IV QUEUEING THEORY L- 9 + T-3

Markovian models – birth and death queuing models – steady state results: single and multiple server queueing models – queues with finite waiting rooms – finite source models – Little's formula.

UNIT V NON-MARKOVIAN QUEUES AND QUEUE NETWORKS L- 9 + T-3

M/G/1 queue – Pollaczek-Khintchine formula – series queues – open and closed networks.

Total: 60 Periods

Learning Resources

i. Text Books:

1. O. C. Ibe, Fundamentals of Applied Probability and Random Processes, Elsevier, Indian Reprint 2007.
2. O. C. Ibe, Markov Processes for Stochastic Modeling, Elsevier, 2009.
3. D. Gross, John F.Shortle, James M. Thompson, Carl. M. Harris, Fundamentals of Queueing Theory (4th Edition), Wiley Student Edition, 2013.

ii. References Books:

1. S. Asmussen, Applied Probability and Queueing Theory (2nd Edn) Springer, Berlin, 2003.
2. W. C. Chan, Performance analysis of telecommunications and local area networks, Kluwer Academic Publishers, 2002.
3. R. B. Cooper, Introduction to Queueing Theory, (2nd Edn), North Holland, New York,1981
4. S. Karlin and H. M. Taylor, A First course in Stochastic processes (2nd Edition) Elsevier, USA, 1975.
5. J. Medhi, Stochastic Processes, New Age Publishers, New Delhi, 1994.
6. J. Medhi, Stochastic models in Queuing theory (2nd Edition) Elsevier Science, USA, 2003.
7. T. G. Robertazzi, Computer Networks and Systems: Queueing Theory and Performance Evaluation (3rd Edn) Springer, Berlin, 2000.
8. S. M. Ross, Stochastic Processes, (2nd Edn.), John Wiley & Sons, New Delhi, 2004.

Course Code: U4CSB07
Course Name: Design and Analysis of Algorithms

L	T	P	C
3	1	0	4

Pre-requisites:

- Basics of Computing and C platform
- C programming lab
- Data Structure lab

Course Educational Objectives:

Students undergoing this course are exposed to

- Basic paradigms and data structures used to solve algorithmic problems
- Estimate the time & space complexity of algorithms and will be able to analyze the performance of algorithms across the domains
- Represent the complexity using asymptotic notations
- Use of appropriate algorithm design methodology to develop algorithms for a given problem

Course Outcomes:

Students undergoing this course are able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain various asymptotic notations and Compute the efficiency of given algorithms	K3
CO2	Apply the brute force technique to solve the given problem	K3
CO3	Use DAC technique to solve a given problem.	K3
CO4	Compute optimum solutions for the given recurrence equation.	K2
CO5	Discuss the improvement of computational efficiency using iterative approaches	K2
CO6	Illustrate the NP completeness and NP hard problem	K2

Course Content:

UNIT I INTRODUCTION **L-9 + T-3**

Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types – Fundamentals of the Analysis of Algorithm Efficiency – Analysis Framework – Asymptotic Notations and its properties – Mathematical analysis for Recursive and Non-recursive algorithms.

UNIT II BRUTE FORCE AND DIVIDE-AND-CONQUER **L-9+T- 3**

Brute Force - Closest-Pair and Convex-Hull Problems-Exhaustive Search - Traveling Salesman Problem - Knapsack Problem - Assignment problem. Divide and conquer methodology – Merge sort – Quick sort – Binary search.

UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE **L-9+T-3**

Computing a Binomial Coefficient – Warshall's and Floyd' algorithm – Knapsack Problem and Memory functions. Greedy Technique – Prim's algorithm- Kruskal's Algorithm- Dijkstra's Algorithm.

UNIT IV ITERATIVE IMPROVEMENT L-9+T-3

The Simplex Method-The Maximum-Flow Problem – Maximum Matching in Bipartite Graphs- the Stable marriage Problem.

UNIT V COPING WITH THE LIMITATIONS OF ALGORITHM POWER L-9+T-3

Limitations of Algorithm Power-Lower-Bound Arguments-Decision Trees-P, NP and NP-Complete Problems--Coping with the Limitations - Backtracking – n-Queens problem – Approximation Algorithms for NP – Hard Problems

Total: 45 + 15 PERIODS

Learning Resources

Text Book:

1. "Introduction to the Design & Analysis of Algorithms", Anany Levitin, Pearson Education, 2009.

Reference Books

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, Cliford Stein, "Introduction to Algorithms", Second Edition, Prentice Hall of India, 2007.
2. "Fundamentals of Computer Algorithms" by Ellis Horowitz, Sartaj Sahmi, Sanguthevar Rajasekaran, University Press, Second Edition (2008).
3. Jon Kleinberg, Eva Tardos, "Algorithm Design", Pearson Education, 2006.
4. Michael T. Goodrich, Toberto Tamassisa, " Algorithm Design: Foundations, Analysis and Internet Examples", Wiley Student Edition, 2007.

Online Resources

1. http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html
2. http://nptel.ac.in/courses/106101060/
3. https://www.coursera.org/course/algo

L	T	P	C
3	0	0	3

Course Code: U4CSB08
Course Name: Theory of Computation

Pre-requisites:

- Mathematics
- Basics of Computers and C Programming

Course Educational Objectives:

Students undergoing this course are exposed to

- Automata theory
- Formal Language Theory
- Computability theory
- Computational complexity theory

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the basic concepts of finite automata and regular expressions.	K2
CO2	Describe the types of grammar and derivation tree.	K2
CO3	Test the equivalence of pushdown automata and CFL.	K3
CO4	Develop a computational model using Turing machine for the given problem.	K3
CO5	Examine the complexity for P and NP completeness for the given problem.	K3

Course Content :

UNIT I FINITE AUTOMATA **9**

Introduction- Basic Mathematical Notation and techniques- Finite State systems – Basic Definitions – Finite Automaton – DFA & NDFA – Finite Automaton with €- moves – Regular Languages- Regular Expression – Equivalence of NFA and DFA – Equivalence of NDFA's with and without €-moves – Equivalence of finite Automaton and regular expressions –Minimization of DFA- Pumping Lemma for Regular sets – Problems based on Pumping Lemma.

UNIT II GRAMMARS **9**

Introduction– Types of Grammar - Context Free Grammars and Languages– Derivations and Languages – Ambiguity- Relationship between derivation and derivation trees – Simplification of CFG – Elimination of Useless symbols - Unit productions - Null productions – Greiback Normal form –Chomsky normal form – Problems related to CNF and GNF.

UNIT III PUSHDOWN AUTOMATA **9**

Pushdown Automata- Definitions – Moves – Instantaneous descriptions – Deterministic pushdown automata – Equivalence of Pushdown automata and CFL - pumping lemma for CFL – problems based on pumping Lemma.

UNIT IV TURING MACHINES **9**

Definitions of Turing machines – Models – Computable languages and functions – Techniques for Turing machine construction – Multi head and Multi tape Turing Machines - The Halting problem – Partial Solvability – Problems about Turing machine- Chomskian hierarchy of languages.

UNIT V UNSOLVABLE PROBLEMS AND COMPUTABLE FUNCTION **9**

Unsolvable Problems and Computable Functions – Primitive recursive functions – Recursive and recursively enumerable languages – Universal Turing machine. MEASURING AND CLASSIFYING COMPLEXITY: Tractable and Intractable problems- Tractable and possibly intractable problems – P and NP completeness - Polynomial time reductions.

TOTAL: 45 PERIODS

Learning Resources:

Text Books

1. John E Hopcraft, Rajeev Motwani, Jeffrey D Ullman, “Introduction to Automata Theory, Languages and Computation”, PEA, Second Edition, 2001
2. Michael Sipser. Introduction to the Theory of Computation, Second Edition, Cenage Learning, India

Reference Books:

1. Green Law, Hoover, “Fundamentals of the Theory of Computation – Principles and practice”, Morgan & Kauffman Publishers, 1998
2. Daniel I.A. Cohen“Introduction to Computer Theory” Wiley-India,ISBN: 978-81-265-1334-5
3. E V Krishnamurthy, “Introduction to Theory of Computer Science”, EWP Second 2nd Ed.
4. K.L.P Mishra, N. Chandrasekaran, “Theory Of Computer Science (Automata, Languages and Computation)”, Prentice Hall India, 2nd Edition
5. Daniel I.A. Cohen, "Introduction to Automata Theory Languages and Computations”, Pearson Education Asia, Second Edition.

Online Resources:

1. http://www.cse.unsw.edu.au/~cs4141/
2. http://www.ugrad.cs.ubc.ca/~cs421/notes/index.html
3. http://www.cs.nyu.edu/courses/spring01/G22.3350-001/

Course Code: U4CSB09
Course Name: Database Management System
Designed for: Year: II Semester: IV

L	T	P	C
3	0	0	3

Pre-requisite:

- Data structure & Algorithm
- Basic C Programming

Links to Other Courses:

- Operating System
- Data Base Technology
- Distributed Computing
- Cloud Computing

Course Educational Objectives

Students undergoing this course are exposed to

- The fundamentals of Database Management Systems.
- Relational Schema.
- ER diagrams.
- Structured Query Language (SQL).
- The fundamentals of Transaction Processing and Query Processing.
- The types of databases.

Course Outcomes

At the end of the course, the students are able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the basic concepts of Database Management System	K2
CO2	Write SQL Queries for the given scenario.	K3
CO3	Apply normalization techniques for the given database application.	K3
CO4	Illustrate the concepts of transaction, Concurrency and Recovery techniques in database.	K2
CO5	Describe the concept of physical storage media.	K2
CO6	Explain the various types of databases	K2

Course Content

UNIT I INTRODUCTION TO DBMS 8

Purpose of Database System -– Views of data – Data Models – Database Languages — Database System Architecture – Database users and Administrator – Entity–Relationship model – E-R Diagrams -- Introduction to relational databases

UNIT II RELATIONAL MODEL 11

The relational Model – The catalog- Types– Keys - Relational Algebra – Domain Relational Calculus – Tuple Relational Calculus - Fundamental operations – Additional Operations- SQL fundamentals– Nested Queries & Join Queries - Integrity – Triggers - Security – Advanced SQL features –Embedded SQL– Dynamic SQL- Missing Information– Views.

UNIT III NORMALIZATION 8

Functional Dependencies – Non-loss Decomposition – Functional Dependencies – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form- Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form

UNIT IV TRANSACTION AND CONCURRENCY 10

Transaction Concepts - Transaction Recovery – ACID Properties – System Recovery – Media Recovery – Two Phase Commit - Save Points – SQL Facilities for recovery – Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Intent Locking – Deadlock- Serializability – Recovery Isolation Levels – SQL Facilities for Concurrency.

UNIT V PHYSICAL STORAGE AND DATABASE CONCEPTS 8

Overview of Physical Storage Media – Magnetic Disks – RAID – Introduction to Distributed Databases and Client/Server Databases- Statistical Databases- Multidimensional and Parallel databases- Spatial and multimedia databases- Mobile and web databases- Object Oriented Databases-XML Databases.

TOTAL: 45 periods

Learning Resources

Text Books:

1. Abraham Silberschatz, Henry F. Korth and S. Sudharshan, “Database System Concepts”, Sixth Edition, Tata Mc Graw Hill, 2011.
2. Ramez Elmasri and Shamkant B. Navathe, “Fundamentals of Database Systems”, Fifth Edition, Pearson Education, 2008.
3. C.J.Date, A.Kannan and S.Swamynathan, “An Introduction to Database Systems”, Eighth Edition, Pearson Education, 2006.

References Books:

1. Raghu Ramakrishnan, “Database Management Systems”, Third Edition, McGraw Hill, 2003.

2. S.K.Singh, “Database Systems Concepts, Design and Applications”, First Edition, Pearson Education, 2006.
3. C. J. Date ,”An Introduction to Database Systems” – 8th Edition, Addison Wesley, 2004.
4. S.K.Singh, “Database Systems Concepts, Design and Applications”, First Edition, Pearson Education, 2006.

i. Online Resources:

a) http://cs.ulb.ac.be/public/_media/teaching/infoh303/dbmsnotes.pdf
b) http://www.iitg.ernet.in/awekar/teaching/cs344fall11/lecturenotes/september%2012.pdf
c) http://sage.virtual-labs.ac.in/home/pub/1/

Course Code: U4CSB10
Course Name: Operating Systems

L	T	P	C
3	0	0	3

Prerequisite:

- System Software
- Computer Organization and Architecture
- Basics of computing

Course Educational Objectives :

Students undergoing this course are exposed to

1. Have an overview of components of an operating systems
2. Learn the concepts of the process and threads
3. Focus on principles of deadlock and related problems of starvations
4. Understand about design issues related to processor scheduling
5. Have a thorough knowledge of Process management, Storage management, I/O and File Management.

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the components of operating systems, process and threads.	K2
CO2	Analyze the process management concept for the given situation.	K3
CO3	Explain the different memory management for the given situation.	K3
CO4	Explain the mass storagestructure system Interface, Implementation and I/O systems.	K2
CO5	Discuss the various operating system concepts for known OS.	K2

Course Content :

UNIT I OPERATING SYSTEMS OVERVIEW 9

Operating system overview: Objectives – functions - Computer System Organization- Operating System Structure - Operating System Operations- System Calls, System Programs. Processes: Process Concept - Process Scheduling - Operations on Processes – Interprocess Communication. Threads: Multicore Programming - Multithreading Models.

UNIT II PROCESS MANAGEMENT 9

Process Synchronization: The Critical-Section Problem - Mutex Locks -Semaphores - Classic Problems of Synchronization – Monitors. CPU Scheduling: Scheduling Criteria - Scheduling Algorithms. Deadlocks: Deadlock Characterization - Methods for Handling Deadlocks -

Deadlock Prevention - Deadlock Avoidance - Deadlock Detection - Recovery from Deadlock.

UNIT III STORAGE MANAGEMENT 9

Main Memory: Swapping - Contiguous Memory Allocation, Segmentation, Paging. Virtual Memory: Demand Paging - Page Replacement - Allocation of Frames - Thrashing. Case Study: Intel 32 and 64 bit architecture.

UNIT IV STORAGE STRUCTURE AND I/O SYSTEMS 9

Mass Storage Structure: Disk Structure - Disk Scheduling - Disk Management. File-System Interface: File Concepts, Directory Structure - File Sharing – Protection. File System Implementation: File System Structure - Allocation Methods, Free Space Management. I/O Systems: I/O Hardware - Application I/O Interface.

UNIT VCASE STUDY 9

Windows 7: Design Principles - System Components - Terminal Services and Fast User – Switching File System. Linux System: Design Principles - Kernel Modules - Process Management - Scheduling - Memory Management - File Systems - Input and Output. MAC: Process Management - Memory Management. Android: Interface, memory management and architecture.

TOTAL: 45 PERIODS

Learning resources

Text Books:

- Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 9th Edition, John Wiley and Sons Inc., 2012.
- Richard Petersen, “Linux: The Complete Reference”, 6th Edition, Tata McGraw-Hill, 2008.

References Books:

- Andrew S. Tanenbaum, “Modern Operating Systems”, 4th Edition, Prentice Hall, Wesley, 2014.
- William Stallings, “Operating Systems – Internals and Design Principles”, 7th Edition, Prentice Hall, 2011.
- Harvey M. Deitel, “Operating Systems”, 7th Edition, Prentice Hall, 2003.
- D M Dhamdhere, “Operating Systems: A Concept-Based Approach”, 2nd Edition, Tata McGraw-Hill Education, 2007.
- Charles Crowley, “Operating Systems: A Design-Oriented Approach”, Tata McGraw HillEducation”, 1996.

Online Resources:

- http://www.tutorialspoint.com/operating_system/
- http://www.mu.ac.in/myweb_test/MCA%20study%20material/OS%20-%20PDF.pdf
- http://codex.cs.yale.edu/avi/os-book/OS8/os8c/slide-dir/PDF-dir/ch2.pdf
- http://www.freebookcentre.net/CompuScience/Free-Operating-Systems-Books-Download.html

Course Code: U4ECB14
Course Name: Microprocessors and Microcontrollers

L	T	P	C
3	0	0	3

Pre-requisite:

- Fundamentals of Computing
- Fundamentals of computing Lab
- Computer Organization and Architecture
- Digital Principles and System Design
- Digital Principles and System Design lab

Course Educational Objectives:

Students undergoing this course are exposed to:

- The internal organization, addressing modes and instruction sets of 8085 processor.
- The internal architecture, memory organizations and addressing modes of 8086 processor.
- The various peripheral such as 8255, 8279, 8251, ADC, DAC 8253, 8257 & 8259 used for interfacing.
- The various functional units of 8051 microcontroller
- The architecture and the functionalities of ARM processor.

Course Outcomes:

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain the internal organization, addressing modes and instruction sets of 8085 processor	K2
CO2	Explain the internal architecture, memory organizations, instruction set and addressing modes of 8086 processor	K2
CO3	Explain the interfacing of various peripheral devices ADC, DAC, 8253, 257, 8259, 8255, 8279, 8251 using 8086 microprocessor.	K2
CO4	Explain the architecture and functional block of 8051 micro controller	K2
CO5	Develop 8051 microcontroller assembly language programme for the given specification.	K3
CO6	Explain the architecture and internal functions of ARM processor.	K2

Course Content :

UNIT I OVERVIEW OF 8085 MICROPROCESSOR 9

General Definitions of Mini Computers, Microprocessor, Microcontroller and Digital Signal Processor-Architecture of 8085 Microprocessor-Addressing Modes-Instruction Set-Timing Diagram-Interrupts-Pin and Signals-Assembly Language Programming.

UNIT II OVERVIEW OF 8086 MICROPROCESSOR 9

Intel 8086 Microprocessor Architecture-Instruction Set and Assembler Directives-Addressing Modes-Procedures-Macros-Maximum and Minimum Modes of Operations-Address Memory

and I/O Memory-Interrupts and Interrupt Service Routines-Pin and Signals-comparison of Pentium processors.

UNIT III PERIPHERAL INTERFACING **9**

Memory Interfacing and I/O Interfacing-Parallel Communication Interface-Serial Communication Interface-D/A and A/D Interface-Timer-Keyboard/Display Controller-Interrupt Controller-DMA Controller.

UNIT IV OVERVIEW OF 8051 MICROCONTROLLER **9**

Architecture of 8051 Microcontroller - I/O Pins, Ports and Circuits - Instruction Set - External Memory of 8051 - Addressing Modes - Counters and Timers - Serial I/O – Interrupts - Assembly Language Programming.

UNIT V OVERVIEW OF LATEST PROCESSORS **9**

RISC and CISC Processor - ARM Processor families – Architecture – Registers – pipeline - core extension - instructions set – Data processing instructions - Branch Instruction - Load and store Instruction - status register Instruction - Mobile Usage in ARM.

TOTAL: 45 PERIODS

Learning Resources:

Text Books :

1. Ramesh S Gaonkar, Microprocessor Architecture, Programming and application with 8085, 4th Edition, Penram International Publishing, New Delhi, 2000. (Unit I).
2. A.K. Ray & K.M.Burchandi, “Advanced Microprocessors and peripherals-Architectures, Programming and Interfacing”, TMH, 2002 reprint. (Unit II,III).
3. Mohammed Ali Mazidi and Janice Gillispie Mazidi, The 8051 Microcontroller and Embedded Systems, Pearson Education Asia, New Delhi, 2003. (Unit IV)
4. Andrew N.Sloss, Dominic Symes and Chris Wright, “ARM System Developers Guide”, Elsevier Morgan Kaufmann Publications, 2004. (Unit V)

Reference Books:

1. Yu-Cheng Liu, Glenn A.Gibson, “Microcomputer Systems: The 8086 / 8088 Family Architecture, Programming and Design”, Second Edition, Prentice Hall of India, 2007.
2. Kenneth J Ayala, The 8051 Microcontroller Architecture Programming and Application, 2nd Edition, Penram International Publishers (India), New Delhi, 1996.
3. M. Rafi Quazzaman, Microprocessors Theory and Applications: Intel and Motorola prentice Hall of India, Pvt. Ltd., New Delhi, 2003.

iii. Online Resources:

1. www.nptel.ac.in/
2.www.microchip.com/wwwproducts/devices.aspx?products=pic18f452
3.www.arm.com

Course Code: U4CSB11
Course Name: Operating System Lab

L	T	P	C
0	0	3	2

Pre-requisite :

- Basics of Computer and C programming
- Computer practice Lab

Course Educational Objectives :

Students are exposed to:

- The basics command of operating systems.
- Demonstrate the scheduling algorithms.
- Demonstrate and Implement the file Organization and allocation strategies
- Demonstrate and Implement the Inter-Process Communication using pipes.
- Demonstrate the page replacement algorithm in different problems.

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Demonstrate the fundamental UNIX commands & system calls	K2,S3
CO2	Apply the scheduling algorithms for the given problem	K3,S3
CO3	Implement the process synchronous concept using message queue, shared memory, semaphore and Dekker's algorithm for the given situation.	K3, S3
CO4	Experiment an algorithm to detect and avoid dead lock	K2, S3
CO5	Implement the various methods in memory allocation and page replacement algorithm.	K3, S3
CO6	Demonstrate the various operations of file system.	K2,S3

Course Content :

Cycle I

1. Basics of UNIX Commands
2. Write Shell Programming to make use of fork, pipe, exec, exit and kill system calls.
3. Write Shell Programming to make use of open, read, write, grep and ls system calls.
4. Write a C program to make use of Message Queue. The Server program reads message from Message Queue and finds number of vowels for messages those from Client1 and also changes the case of message those from Client2.
5. Write a C program to make use of shared memory, to find maximum and minimum numbers among n set of numbers.

Model Practical Examination I

Cycle II

6. Write a C program to implement Dekker's algorithm by creating two related process P0 and P1, where the process P0 gets the input string from the user, process P1 perform reverse the string and the process P0 swap the each consecutive two characters.
7. Write a C program to make use of Semaphore and to solve the Producer/Consumer problem.
8. Write a C program to implement the Banker's algorithms to avoid Deadlock.
9. Write a C program to implement memory allocation using First Fit, Best Fit, and Worst Fit methods and find efficient method among them
10. Write a C program to implement page replacement algorithm such as FIFO,LRU and OPTIMAL.
11. Write a C program to simulate file system using Linked allocation, to create a file, append to a file, display file and display directory structure.

Model Practical Examination II

Learning Resources:

Reference Books:

1. Universal Command Guide: For Operating Systems – April 15, 2002 ,by Guy Lotgering
2. The Easy Guide to Operating Systems, Larry Miller,2012.

L	T	P	C
0	0	3	2

Course Code: U4CSB12
Course Name: Database Management System Lab
Designed for: Year: II Semester: IV

Pre-requisite:

- Data structure Lab.

Course Educational Objectives

Students undergoing this course are exposed to

- Learn to create and use a database
- Be familiarized with a query language
- Have hands on experience on DDL and DML Commands
- Enhancing knowledge about SQL Queries, PL/SQL functions & basics of front end tools.
- Familiarize advanced SQL queries and be exposed to different applications

1. Course Outcomes

At the end of the course, the students are able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Create database using DDL and retrieve data from database using DML for a given situation.	K3,S3
CO2	Experiment Nested query, Integrity Constraints and Views in database	K3,S3
CO3	Demonstrate trigger, function and procedure using PL/SQL.	K3,S3
CO4	Develop Projects using front end and back end.	K4,S3

Course Content

LIST OF EXPRIMENTS

Cycle-1

1. DDL Commands – Table Creation, Altering the table structures, truncating a table and dropping a table.
1. DML Commands – Insert, Select Commands, update & delete Commands.
3. Creating relationship between the databases – Nested Queries & Join Queiries
4. Creating an Employee database to set various constraints.
5. Views – Create a Virtual table (Views) based on the result set of an SQL statement.
6. To create PL/SQL functions and to implement the stored procedures in SQL (Function and Procedures).

Model practical Examination-I

Cycle-2

7. To study the basics of front end tools.
8. To implement the forms using front end tool and use oracle for database creation.

9. Triggers – To create a statement that executes automatically as a side effect of a modification to the DB.
10. Menu Design – To Design menus using menu editor in Visual Basic.
11. Reports – To generate data report from existing DB
12. Mini Project (Application Development using Oracle/Mysql)
    a) Inventory Requirement Processing.
    b) Material Requirement Processing.
    c) Hospital Management System.
    d) Railway Reservation System.
    e) Personal Information System.
    f) Web Based User Identification system.
    g) Timetable Management System.
    h) Hotel Management System.

Model practical Examination-II

2. Learning Resources:

i. Reference Books:

1. Database Management Systems solutions manual, Raghu Ramakrishnan, Johannes Gehrke, Jeff Derstadt, Scott Selikoff and Lin Zhu, third Edition, 2013
2. SQL with Guru99 by Krishna Rungta, Smashwords 2013
3. A Primer on SQL by Rahul Batra, dreamincode.net 2012
4. Learn SQL The Hard Way by Zed A. Shaw, LCodeTHW 2011
5. Developing Time-Oriented Database Applications in SQL, by Richard T. Snodgrass, Morgan Kaufmann 1999

Course Code: U4ECB17
Course Name: Microprocessors and Microcontrollers Lab

L	T	P	C
0	0	3	2

Prerequisite:

- Fundamentals of Computing
- Computer Practice Lab
- Computer Organization and Architecture
- Digital Principles and System Design
- Digital Principles and System Design lab

Course Educational Objectives :

Students undergoing this course will be exposed to:

- Functional concepts of assembly language programme in 8085, 8086, 8051 and ARM processor.
- Concepts of interfacing with 8086 microprocessor using assemble language programming.
- Concepts of assembly language programme in 8086 microprocessor using MASM Software.

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Develop and implement assembly language program for performing basic mathematical manipulation using 8085 microprocessor kit	K3,S3
CO2	Develop and implement assembly language program to data handling using 8086 microprocessor kit	K3,S3
CO3	Develop and implement assembly language program in 8086 microprocessor to data handling using MASM software.	K3,S3
CO4	Demonstrate the application traffic light control, stepper motor, 8279, 8251, 8255, A/D & D/A interface for the given specification using 8086	K3, S3
CO5	Develop and implement assembly language program for performing basic mathematical manipulation using 8051 microcontroller.	K2, S3
CO6	Develop the input/output and keyboard interfacing programme for the given specifications using ARM processor.	K3,S3

Course Content :

8085 Programs using kits

1. 8 bit/16 bit Multiplication/Division using Addition/Subtraction.
2. Code Conversion, Decimal Arithmetic and Bit Manipulation.
3. Matrix Multiplication.

8086 Programs using kits and MASM

4. String Manipulations
5. Sorting and Searching
6. Find and Replace

Peripherals and Interfacing Experiments

7. Traffic light control
8. Stepper motor control
9. Key board and Display
10. Serial interface and Parallel interface
11. A/D and D/A interface

8051 Experiments using kits

12. Basic arithmetic and Logical operations
13. Square and Cube program, Find 2's complement of a number
14. Unpacked BCD to ASCII

ARM Processor Experiments

15. I/O Programming.
16. 4X4 Keyboard Matrix.

Learning Resources:

References Books:

1. The 8085 Microprocessor: Architecture, Programming and Interfacing,by Umashankar B.S., Udaya Kumar K.,Pearson Education India, 2008.
2. The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications, Walter A. Triebel and Avtar Singh,1991
3. ARM Architecture Reference Manual ,David Seal , Addison-Wesley Second Edition, ISBN-10: 0201737191, ISBN-13: 978-0201737196

SEMESTER V

Code No	Subjects	L	T	P	C
Theory					
U5MAB07	Discrete Mathematics	3	1	0	4
U5CSB13	Compiler Design	3	1	0	4
U5CSB14	Software Engineering & Project Management	3	0	0	3
U5CSB15	Data Communication and Computer Networks	3	0	0	3
U5CEB13	Environmental Science and Engineering	3	0	0	3
*****	Departmental Elective - I	3	0	0	3
Practical					
U5CSB17	Networks lab	0	0	3	2
U5CSB18	Compiler Design Lab	0	0	3	2
U5CSB19	Windows Programming Lab	1	0	3	2
Total Credits					27

SEMESTER-V

U5MAB07 DISCRETE MATHEMATICS

L	T	P	C
3	1	0	4

Course Educational Objectives:

Students undergoing this course are expected to gain:

- Fundamental concepts of set theory, Functional and relational properties and operations
- Working knowledge on Boolean algebra.
- Basic probability theory and applications, Counting principles.
- Recursive definitions and solutions of simple of recurrence relations and generating functions.
- Graph algorithms and their applications to computer science.

Course Outcomes

Students undergoing this course are able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Formulate and analyze truth tables, tautologies, normal forms and rules of inference in propositional calculus.	K1
CO2	Formulate and analyze normal forms, rules of inference using predicates and validity of arguments	K1
CO3	Solve problems involving sets, functions, relations, graphs and trees, Boolean algebra.	K2
CO4	Demonstrate the knowledge about the functions and their properties, and, also recursive functions and permutation functions	K3
CO5	Apply their working knowledge in Group theory.	K3

Pre-requisites:

- Probability and Queuing theory

Course Content:

UNIT I PROPOSITIONAL CALCULUS

Propositions – logical connectives – compound propositions – conditional and biconditional propositions – truth tables – tautologies and contradictions – contra positive – logical equivalences and implications– De Morgan's laws – normal forms – principal conjunctive and disjunctive normal forms – rules of inference – arguments – validity of arguments

UNIT II PREDICATE CALCULUS 9

Predicates – statement function – variables – free and bound variables – quantifiers – universe of discourse – logical equivalences and implications for quantified statements –

theory of inference – the rules of universal specification and generalization – validity of arguments

UNIT III SET THEORY 9

Basic concepts – subsets – algebra of sets – the power set – ordered pairs and Cartesian product – relations on sets – types of relations and their properties – matrix representation of a relation – graph of a relation – partitions – equivalence relations – partial ordering – poset – Hasse diagram – Lattices and their properties – sub-lattices – Boolean algebra – homomorphism

UNIT IV FUNCTIONS 9

Definitions of functions – classification of functions – types of functions – examples – compositions of functions – inverse functions – binary and n-ary operations – characteristic function of a set – Hashing functions – recursive functions – permutation functions

UNIT V GROUPS 9

Algebraic systems – definitions – examples – properties – semi groups – monoids – homomorphism – sub semi group and submonoids – cosets and Lagrange's theorem – normal subgroups – normal algebraic system with two binary operations – codes and group codes – basic notions of error correction – error recovery in group codes

TOTAL: 45+15(Tutorial) = 60 periods

Learning Resopurces

Text Books

1. Tremblay and Manohar R, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw-Hill, New Delhi, 2009.
2. Kenneth H. Rosen, Discrete Mathematics and its Applications, 6th edition, Tata McGraw Hill, New Delhi, 2008.

Reference Books

1. Bernard Kolman, Robert C. Busby, Sharan Cutler Ross, Discrete Mathematical Structures, 4th Indian reprint, Pearson Education, New Delhi, 2003.
2. Ralph P. Grimaldi, Discrete and Combinatorial Mathematics, 4th edition, Pearson Education, New Delhi, 2002.

Web References

1. http://www.uea.ac.uk/~j108/propcalculus.htm
2. http://people.hofstra.edu/stefan_waner/realworld/logic/logic2.html
3. http://ndp.jct.ac.il/tutorials/Discrete/node13.html
4. https://www.princeton.edu/~hhalvors/restricted/normal.pdf
5. http://people.hofstra.edu/stefan_waner/realworld/logic/logic5.html
6. http://tamanoi.math.ucsc.edu/tamanoi/Chapter%202%20Exercises/Page%207.pdf
7. www.ohio.edu/people/melkonia/math306/slides/logic4.ppt
8. http://crab.rutgers.edu/~guyk/dmlec/lectures/lec17/l17.pdf
9. http://www.math.uvic.ca/faculty/gmacgill/guide/logic.pdf
10. http://people.umass.edu/partee/NZ_2006/Set%20Theory%20Basics.pdf
11. http://mathandmultimedia.com/2010/09/29/basic-concepts-of-functions/
12. http://www.mathsisfun.com/combinatorics/combinations-permutations.html
13. http://ptucse.loremate.com/ds/node/8

U5CSB13 COMPILER DESIGN

L	T	P	C
3	1	0	4

Course Educational Objectives:

Students undergoing this course are expected to:

- To introduce the major concepts of language translation and design of compilers.
- To develop an awareness of the function and complexity of modern compilers, linkers,

loaders and assemblers

- To give students the knowledge and skills necessary to develop system software covering a broad range of engineering and scientific applications.
- To learn context free grammars, compiler parsing techniques, construction of abstract

syntax trees, symbol tables, and actual code generation

- To provide a thorough coverage of the basic issues in programs interacting directly with operating systems

Course Outcomes:

Students undergoing this course are able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Develop lexical rules and grammars for a programming language.	K3
CO2	Apply the different parsing techniques using parsers for designing syntax analyzer.	K2
CO3	Apply the knowledge of intermediate languages.	K2
CO4	Design code generator and solve the issues in it.	K3
CO5	Apply the code optimization in the run time environments.	K2

Pre-requisites:

- Theory of computation
- Operating system

Course content

UNIT I INTRODUCTION TO COMPILERS **9**

Compilers, Analysis of the Source Program, The Phases of a Compiler, Cousins of the Compiler, The Grouping of Phases, Compiler-Construction Tools, Translators-Compilation and Interpretation, A simple one-pass compiler. LEXICAL ANALYSIS:Need and role of lexical analyzer-Lexical errors, Input Buffering - Specification of Tokens, Recognition of Tokens, A Language for Specifying Lexical Analyzers, Finite Automata, From a Regular Expression to an NFA, Design of a Lexical Analyzer Generator.

UNIT II SYNTAX ANALYSIS **9**

Need and role of the parser- Context Free Grammars-Top Down parsing - 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, YACC- Design of a syntax analyzer for a sample language.

UNIT III INTERMEDIATE CODE GENERATION 9

Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.

UNIT IV CODE GENERATION 9

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT V CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS 9

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing**.**

TOTAL: 45+15(Tutorial) = 60 periods

Learning Resources

Text Books

1.Alfred Aho, Ravi Sethi, Jeffrey D Ullman, "Compilers Principles, Techniques and Tools", Pearson Education,Second Edition, 2011.
2.A.A.Puntambekar,"Compiler Design", third Edition, Technical Publications, 2009.

Reference Books

1. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
2. A.A.Puntambekar, "Automata and Compiler Design", 1st Edition Technical Publications, 2010
3. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.
4. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003.
5. Stevens S. Muchnick,"Advanced Compiler Design and Implementation", Morgan Kaufmann,1997.

Web References

1. http://www.cs.nyu.edu/courses/fall06/G22.2130-001/class-notes.html
2. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-KANPUR/compiler-desing/ui/Course_home-2.htm
3. http://www.cs.cmu.edu/~fp/courses/15411-f09/lectures/01-overview.pdf

LEARNING AND TEACHING ACTIVITIES:

Learning and Teaching Modes:

This course relies on lectures to guide through the material, tutorial classes to provide students with class, and a sequence of written and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

U5CSB14 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT **L T P C**
3 1 0 4

Course Educational Objectives:
Students undergoing this course are expected to

- Understand conventional software management and software economics evolution.
- Learn the knowledge about life cycle phases, iterative process planning, organization and responsibilities and process automation can be understood.
- Learn modern project profiles and modern project transition.

Course Outcomes:
Students undergoing this course are able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Design and experiment with software lifecycle models.	K2
CO2	Understand the metrics and risk and apply the risk assessment factors.	K2
CO3	Apply the knowledge and comparison of various testing strategies and tools.	K2
CO4	Apply the concepts of quality and roles of software quality	K2
CO5	Apply the project management principles in developing the projects	K2

Course Content

UNIT I INTRODUCTION **8**

The evolving role of Software – Software characteristics, Software Process: Software Lifecycle models –-The linear sequential model - The prototyping model - The RAD model - Evolutionary software process models - The incremental model - The spiral model- Various Phases in Software Development

UNIT II Risk Management & Metrics **9**

Metrics for Process and Products: Software Measurement, Metrics for software quality.
Risk Analysis & Management: Assessment-Identification–Projection-Refinement-Principles, Introduction to Coding Standards.

UNIT III TESTING TECHNIQUE & TESTING TOOLS **9**

Software testing fundamentals - Test case design - White box testing - Basis path testing - Control structure testing - Black box testing - Testing for specialized environments, Testing strategies - Verification and validation - Unit testing - Integration testing - Validation testing - System testing - The art of debugging, Testing tools - Win runner, Load Runner.

UNIT IV SOFTWARE QUALITY ASSURANCE **10**

Quality concepts - cost of quality - Software Quality Group (SQA)-Roles and responsibilities of SQA group- Formal Technical reviews- Quality standards .

UNIT V SOFTWARE PROJECT MANAGEMENT **9**

Introduction to MS Project –Creating a Project Plan File-Creating Work Break Down Structure-Creating and Assigning Resources-Finalizing the project plan -Case Study.

TOTAL: 45 periods

Text Books

1. Roger. S. Pressman, "Software Engineering – A Practitioner's Approach", seventh Edition, McGraw Hill , 2010.
2. Ian Sommerville, "Software Engineering", eighth edition, Pearson Education, New Delhi, 2011.
3. Bill Brykczynski, Richard D. Stutz ,"Software Engineering Project Management", Wiley India Edition, IEEE computer society, 2007.

Reference Books

1. Fairley R, "Software Engineering Concepts", second edition, Tata McGraw Hill,New Delhi, 2003.
3. Jalote P, "An Integrated Approach to Software Engineering", third edition, Narosa Publishers, New Delhi, 2005.

Web References

1. www. Msuniv.ac.in/soft.pdf
2. ebookbrowse.com/1001-software engineering and project management
3. www.ksu/edu.sa/project management.

U5CSB15 DATA COMMUNICATION AND COMPUTER NETWORKS

L	T	P	C
3	1	0	4

Course Educational Objectives:

Students undergoing this course are expected to

- Gain knowledge of elementary sockets
- Learn the concepts to implement applications using i/o multiplexing and socket options
- Understand different protocols and network components
- To introduce the functions of network in different layers.

Course Outcomes:

Students undergoing this course are able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Understand the hardware and software used in data communications and networking.	K1
CO2	Explain how to implement and analyze simple computer networks.	K2
CO3	Apply the error detection and error correction in the data link layer using the protocols.	K3
CO4	Explain the design issues in the networking and transport layer.	K2
CO5	Explain the design issues in the application layer.	K2

Course Content

UNIT I INTRODUCTION TO DATA COMMUNICATION 9

Data Communication: Data Communication system components, Networks, Protocols- Standard making organizations - Data rate and Channel capacity - Encoding and Digital data communication techniques-Concepts of source coding and channel coding - Asynchronous and Synchronous transmission - Comparison of bit / baud for various keying technique ASK, PSK, FSK, QAM - Interfaces and modems - Digital data transmission - Parallel and Serial DTE / DCE interface data terminal equipment, data circuit terminating equipment - Standards RS 232, Transmission rate of modems, Modem standards.

UNIT II COMPUTER NETWORKS 9

Computer Networks: Network Structure - Network Architecture - Line configuration - Topology of networks - Transmission modes - Categories of Networks - Inter-Networks - OSI model - Functions of different layers - Physical layer - Switching: Circuit switching, Packet switching, Message switching - Network layer - Connection oriented and connectionless services. Local area network - Networking and inter-networking devices - Repeater - Bridges - Routers - Gateways - Ethernet - Token bus - Token ring - FDDI comparison - LAN controller.

UNIT III DATA LINK CONTROL 9

Types of errors and detection, redundancy, VRC, LRC, CRC techniques - Error correction - Forward and backward error correction - Single bit and multi bit error correction - Hamming code. Data link control: Need for data link control - Line discipline, ENQ / ACK, Flow control stop and wait sliding window protocol, Error control, ARQ, Stop and wait ARQ, Sliding window ARQ Protocols: Asynchronous and Synchronous communications - Asynchronous and Synchronous Protocol - Character oriented protocol, BSC, bit oriented protocols - HDLC frames - Link access procedures.

UNIT IV NETWORK AND TRANSPORT LAYER 9

Network layer design issues, Congestion Control algorithm, Routing algorithm - Transport layer - Design issues- Duties of the Transport layer, Connection management - OSI Transport Protocol - Transport Protocol data unit. Upper OSI layers - Session layer: Session and Transport initialization - Synchronization points - Session Protocol Data unit - Presentation layer – Translation.

UNIT V APPLICATION LAYER 9

.Application layer - Message handling systems - Presentation concepts – SNMP-Abstract syntax notation.1 (ASN.1), structure of management, Protocols File Transfer Access and Management (FTAM) - Virtual Terminal (VT) - Directory services - Common Management Information Protocol - TCP/IP: TCP/IP and the Internet - TCP/IP and OSI.

TOTAL: 45 periods

Learning Resources

Text Books

1. Behrouz Forouzan, “Introduction to Data Communications and Networking”, TataMcGraw Hill, 4th Edition, 2007.
2. Stallings, “Data and Computer Communications”, PHI, 8th Edition, 2007.

Reference Books

1. William Schewber ,“Data Communication”, McGraw Hill, 2009.
2. Tanenbaum , “Computer Networks”, PHI, 5th Edition, 2011

Web References

1. http://people.du.ac.in/~ngupta/teach_networks.html
2. http://www.cs.hunter.cuny.edu/~saad/courses/networks/notes/note1_ho.pdf
3. http://www.vub.ac.be/BIBLIO/nieuwenhuysen/courses/chapters/network.pdf
4. http://lecturenotes.in/notes/engg/paper/dccn/page1.html

LEARNING AND TEACHING ACTIVITIES:

Learning and Teaching Modes:

This course relies on lectures to guide through the material, tutorial classes to provide students with class, and a sequence of written and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

U5CEB13 ENVIRONMENTAL SCIENCE AND ENGINEERING **L T PC**
3 0 0 3

Course Educational Objective

Students undergoing this course are able to

- Understand what constitutes the environment, what are precious resources in the environment.
- Explain How to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations.
- Explain How to maintain ecological balance and preserve bio-diversity.

Course Outcomes

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	**Have a clear view of structure of the environment**	K2
CO2	**Basic concepts of Eco system**	K2
CO3	**Understand the importance of environmental pollution**	K2
CO4	**Understand the concept of social issues related to environment**	K2
CO5	**Basic concepts of human pollution and environment.**	K2

Pre Requisite:

- Engineering Chemistry

Course Content

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES 9

Definition, scope and importance – Need for public awareness – Forest resources: Use, effect of their over exploitation and Deforestation, Timber extraction and Mining – Water resources: Surface source, subsurface source and ground water, Rainwater harvesting (Methods & merits and simple layout) floods, drought- Dams, benefits and problems–Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, Drainage and their effects– Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources – Land resources: Land as a resource, land degradation, soil erosion, Desertification and Landslides.

UNIT II ECOSYSTEMS AND BIODIVERSITY 9

Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Aquatic ecosystems (ponds and oceans)

– Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity –Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at local level – India as a mega-diversity nation – Hot spots of biodiversity – criteria for recognizing hot spots – Biodiversity hot spots in India – Threats to biodiversity: habitat loss, poaching of wildlife - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT III ENVIRONMENTAL POLLUTION 9

Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Soil waste Management: Causes, effects and control measures of urban and industrial wastes –Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides and tsunami.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 9

From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, case studies –Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – Wasteland reclamation – Consumerism and waste products – Environment Production Act – Air (Prevention and Control of Pollution) Act – Water (Prevention and control of Pollution) Act –Forest Conservation Act.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 9

Population growth, variation among nations – Population explosion – Family Welfare Programme – Environment and human health – Human Rights – Value Education – HIV / AIDS – Women and Child Welfare – Role of Information Technology in Environment and human health.

TOTAL: 45 periods

Learning Resources:

TEXT BOOKS

1. Gilbert M.Masters, Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition, ISBN 81-297-0277-0, 2004.
2. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co.
3. Townsend C., Harper J and Michael Begon, Essentials of Ecology, Blackwell Science.
4. AnubhaKaushik and C.P. Kaushik, Environmental Science and ngineering,New Age International publishers, 2005.
5. S.S.Dara, Text book of Environmental Chemistry and Pollution ontrol,S.Chand and Co., 2002.
6. N. Nandini, N. Sunitha and SucharitaTandon, Environmental Studies, Sapna Book House, 2007.

REFERENCE BOOKS

1. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001.
2. Mackenzie L. Davis and Susan j. Masten, Principles of Environmental Engineering and Science, McGraw Hill Co., International Edition ISBN 0-07-119449-5, 2004.
3. Wager K.D., Environmental Management, W.B. Saunders Co., Philadelphia, USA, 1998.
4. BharuchaErach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad India, Email: mapin@icenet.net
5. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media.

.WEB REFERENCES

1. http://www.scribd.com/doc/63816326/Environmental-Science-and-Engineering-Lecture-Notes
2. http://ebookbrowse.com/environmental-science-and-engineering-lecture-notes-pdf-d369351274

.

U5CSB16 GRAPHICS AND IMAGE PROCESSING **L TPC**
3 0 0 3

Course Educational Objective

Students undergoing this course are expected to

1. Provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.
2. Explain the thorough introduction to computer graphics techniques, focusing on 2D and 3D modeling, image synthesis, and rendering.
3. Expose to the interdisciplinary nature of computer graphics is emphasized in the wide variety of examples and applications.

Course Outcomes

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Discuss various line drawing, circle drawing, elipse drawing algorithms	K3
CO2	Explain various basic concepts in computer graphics	K2
CO3	Explain various shading models	K2
CO4	Explain basics in image processing	K2
CO5	Discuss about various modeling used to represent image	K3
CO6	Explain about 2D image segmentation	K2
CO7	Explain about image reconstruction and animation I 3D	K2

Pre-requisite

- **Mathematics**

Course content

UNIT I REVIEW OF GRAPHICS FUNDAMENTALS **9**

Basic raster graphical algorithm for 2D primitives, Line drawing algorithm, Circle drawing algorithm, Ellipse drawing algorithm, 2D and 3D transformations; Window, Viewport, Clipping algorithm; Bezier curve, b-spline curve, surfaces, Parallel projection, Perspective projection

UNIT II SHADING **9**

Illumination mode, Specular reflection model, Shading models for curve surfaces, Radiosity method, Rendering, Recursive ray tracing, Texture mapping

UNIT III IMAGE MANIPULATION & STORAGE **9**

Image, Elementary Image processing techniques; Multipass transformation, Image Compositing.
Advanced Modeling Techniques: Procedural Models, Fractal Models, Grammar based models, particle systems, Volume rendering.

UNIT IV SEGMENTATION IN 2D **9**
Greedy and Local Methods – Watersheds and minimum spanning trees Deformable Methods – Intelligent scissors/ livewires, active contours; DP snakes, region and boundary methods

UNIT V IMAGE RECONSTRUCTION AND ANIMATION **9**
Anisotropic reconstruction, restoration, noise removal, high dynamic & range imaging and inpainting **Animation:** 3D animation, morphing and simulation of key frames

TOTAL: 45 periods

Text Books
1. Hearn & Baker, "Computer Graphics C version", 2nd ed. Pearson Education, 2011.
2. Milan Sonka and Vaclav, "Image Processing, Analysis and Machine Vision", 4th Edition, Thomson Learning, 2014.

Reference Books

1. Dave Shreiner, Graham Sellers, John M. Kessenich, Bill M. Licea-Kane ,"OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 4.3", 8th Edition, ARB working group.
2 Hearn and Baker, "Computer Graphics using open GL", 3rd edition, Pearson Education,2009.
3. Rogers, "Procedural Element for Computer Graphics", 2nd ed, Tata McGraw Hill, 2001.

Web References

1. www.cs.manchester.ac.uk/ugt/COMP27112/
2. www.slideshare.net/.../computer-graphics-image-processing-lecture-n.
3. www.springer.com › Home › Computer Science › Image Processing
4. www.cis.temple.edu/~latecki/Courses/CIS601-03/cis601-03.htm

LEARNING AND TEACHING ACTIVITIES:
Learning and Teaching Modes:

This course relies on lectures to guide through the material, tutorial classes to provide students with class, and a sequence of written and online assignments to provide formative assessment opportunities for students to practice techniques and develop their understanding of the course.

U5CSB17 NETWORKS LAB **L T P C**
0 0 3 2

Course Educational Objectives:

Students undergoing this course are expected to

- Learn the basic concepts of network programming.
- Understand the concepts of elementary sockets using TCP and UDP and write a network program using TCP and UDP.
- Understand the concepts of I/O Multiplexing and socket options and implement them in programming.
- Understand the concepts of inter-process communication (IPC) using pipes, FIFO, Message Queue, semaphores and shared memory and implement these IPCs.

Course Outcomes:

Students undergoing this course are able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Implement the various protocols.	K3
CO2	Analyze the performance of the protocols in different layers.	K2
CO3	Analyze various routing algorithms.	K2
CO4	Develop a Client and Server Applications.	K3
CO5	Demonstrate Simulators like NS2/ Glomosim / OPNET.	K3

Pre-requisites: NIL

LIST OF EXPERIMENTS:

1. Simulation of ARP / RARP.
2. Write a program that takes a binary file as input and performs bit stuffing and CRC Computation.
3. Simulation of Sliding-Window protocol.
4. Simulation of BGP / OSPF routing protocol.
5. Develop a Client – Server application for chat using TCP.
6. Develop a Client – Server application for chat using UDP.
7. Develop an application for transferring files using FTP.
8. Develop a Client that contacts a given DNS Server to resolve a given host name.
9. Write a Client to download a file from a HTTP Server.
10. Study of Network Simulators like NS2/ Glomosim / OPNET.

U5CSB18 COMPILER DESIGN LAB **LT P C**
0 0 3 2

Course Educational Objectives:

Students undergoing this course are expected to

- To develop programs in different parsers, optimization etc.,
- To develop programs in various tools like LEX and YACC for scanning and parsing

Course Outcomes:

Students undergoing this course are able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Implement the different Phases of compiler using tools	K3
CO2	Analyze the control flow and data flow of a typical program	K2
CO3	Optimize a given program	K3
CO4	Generate an assembly language program equivalent to a source language program	K2
CO5	Develop Symbol Table, E-Closure and Operator precedence parsing.	K3

Pre-requisites:

- Operating System Lab

LIST OF EXPERIMENTS:

1. Implement a lexical analyzer in "C".
2. Implement a Shift Reduce Parser in "C".
3. Use LEX tool to implement a lexical analyzer.
4. Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.
5. Use YACC and LEX to implement a parser for the same grammar as given in problem.
6. Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and * and computes and prints its value.

7 & 8. Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.

9 & 10. Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using an 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.

U5CSB19WINDOWS PROGRAMMING LAB **L T P C**
(common for CSE, IT) **0 1 3 2**

Course Educational Objective

Students undergoing this course will be able to

1. Understand the concepts of Visual C++ programming
2. Learn knowledge about windows programming.
3. Clear the basics concepts of Object Oriented Programming (C++).
4. Understand and deal with editors, tools, class libraries Debugging

Course Outcomes

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the windows environment, windows architecture and programming on windows.	K2
CO2	Explain basic drawing and how to output the text	K2
CO3	Demonstrate the basics of keyboard , mouse and cursors.	K3
CO4	Explain Multithreading in windows	K2
CO5	Explain Memory management in windows	K2

Pre-requisite

- Database management lab

Link to other courses

- J2SE core Java Lab
- ASP.NET Lab
- C# Lab
- Project

Course content
TUTORIAL

UNIT I INTRODUCTION TO WINDOWS &WINDOW MESSAGES

The windows Environment-Windows Programming Options-First window Program-Windows and Messages-Architectural Overview- creating the window – displaying the window – message loop – the window procedure – message processing-WM_PAINT-WM_DESTROY.

UNIT II TEXT OUTPUT AND BASIC DRAWING

Text output – Painting and Repainting – Introduction to GDI – Device context – Basic drawing – Drawing Dots & Lines-GDI Mapping Modes.

UNIT III RESOURCES IN WINDOW

Keyboard Basics-Keystroke Message-Character Messages-Mouse Basics-Client area Mouse Message- Non Client area Mouse Message-Icons-Cursors-Strings-Custom Resources-Menus-Button classes-Control and Colors.

UNIT IV MDI, MULTITHREADING AND DLL

MDI concepts-Sample MDI Implementation-Multithreaded Architecture-Thread Synchronization-Windows Multithreading-Library Basics.

UNIT V WIN32 MEMORY MANAGEMENT

WIN32 Memory Management-WIN32 File I/O and Memory Mapped File.

Learning resources

Text Books

1. Charles Petzold, "Windows Programming", Microsoft press, 1999.(UNIT I – IV)
2. Win Hart, Johnson M. "Windows System Programming ",4th Edition, 2010.

LAB EXPERIMENTS:

1. Window Creation.
2. Writing code for keyboard and Character Messages.
3. Implementation of Basic Drawing.
4. Display of colors using scrollbars.
5. Demonstration of Menu, Accelerator, Tool tip, Tool bar.
6. Creating MDI applications
7. Threads
8. Creating DLLs and using them
9. Mouse Button Program.

SEMESTER VI

Code No	Subjects	L	T	P	C
Theory					
U6MAB03	Numerical Methods	3	1	0	4
U6CSB20	C# and .NET	3	0	0	3
U6CSB21	Object Oriented Analysis and Design	3	0	0	3
U6CSB22	Enterprise java and Web services	3	0	0	3
*****	Departmental Elective - II	3	0	0	3
*****	Open Elective –I	3	0	0	3
Practical					
U6ITB09	Case Tools Lab	0	0	3	2
U6CSB23	Web services Lab	0	0	3	2
U6CSB24	C# and .NET Lab	0	0	3	2
Total Credits					25

L – Lecture; T – Tutorial; P – Practical; C – Credit

SEMESTER-VI

U6MAB03 **Numerical Methods** **L T P C**
3 1 0 4

Pre-requisite:

- Engineering Mathematics-I
- Engineering Mathematics-II
- Transforms and Partial Differential Equations.

Course Educational Objectives:

Students undergoing this course are exposed to

- Development of computational skills in numerical methods.
- Applications of numerical methods in engineering problems which require solutions of linear systems, eigenvalues, eigenvectors, interpolation , solution of ODEs, PDEs and statistical problems , testing of hypotheses.
- Equipping the students with knowledge computational mathematics to take of first graduate course, specialized systems and research.

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Applications of numerical methods for solution of algebraic equations involving different methods under different conditions.	K3
CO2	Applications of interpolation methods and finite differences for solving second order linear equations.	K3
CO3	Applications of numerical differentiation and integration.	K3
CO4	Applications of fourth order Runge - Kutta method single – step methods and multi-step methods, Milnes and Adams predictor and corrector metods for solving ordinary differential equations.	K3
CO5	Numerical solution of partial differential equations of Laplace and Poisson equations, one-dimensional heat equation, two-dimensional heat equation and wave equation.	K3

Course Content :

UNIT I: SOLUTION OF TRANSCENDENTAL EQUATIONS AND EIGENVALUE PROBLEMS **9+3**

Solution of equations – iteration method – Newton-Raphson Method – solution of linear system by Gaussian elimination and Gauss-Jordan method – iterative methods – Gauss-

Jacobi and Gauss-Seidel methods – inverse of a matrix by Gauss-Jordon method –finding the eigenvalues of a matrix by power method

UNIT II: INTERPOLATION 9+3

Lagrangian interpolating polynomials – interpolation with equal intervals – Newton's forward and backward difference formulae – central difference formulae – interpolation with unequal intervals – divided differences – Newton's divided difference formula.

UNIT III :NUMERICAL DIFFERENTIATION AND INTEGRATION 9+3

Differentiation using interpolation formulae – numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rules – Romberg's method – two and three point Gaussian quadrature formulae – double integrals using trapezoidal and Simpson's rules.

UNIT IV: NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS 9+3

Single-step methods – Taylor series method – Euler method for first order equation – Fourth order Runge-Kutta method for solving first and second order equations – multi-step methods – Milne's and Adam's predictor and corrector methods

UNIT V: NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS 9+3

Classification of second order PDE - finite-difference approximations to partial derivatives – solution of Laplace and Poisson equations – solution of one-dimensional heat equation – solution of two-dimensional heat equation - solution of wave equation.

TOTAL : 45+15(Tutorial) = 60 periods

Learning Resources:

Text Books:

1. S.S. Sastry, Introductory Methods of Numerical Analysis, 4th edition, PHI Learning Private Limited, New Delhi, 2007.
2. B.S. Grewal and J.S. Grewal, Numerical Methods in Engineering and Science, 6th edition, Khanna Publishers, New Delhi, 2004.
3. John H. Mathews and Kurtis D. Fink, Numerical Methods using MATLAB, 4th edition, PHI Learning Private Limited, New Delhi, 2007.
4. C.F. Gerald and P.O. Wheatley, Applied Numerical Analysis, 6th edition, Pearson Education, Asia, New Delhi, 2006.

Reference Books:

1. A.K. Ray and K.M.Burchandi, Intel Microprocessors Architecture Programming and Interfacing, McGraw Hill International Edition, 2000
2. Kenneth J Ayala, The 8051 Microcontroller Architecture Programming and Application, 2nd Edition, Penram International Publishers (India), New Delhi, 1996.
3. 3. M. Rafi Quazzaman, Microprocessors Theory and Applications: Intel and Motorola prentice Hall of India, Pvt. Ltd., New Delhi, 2003.

Online Resources:

1. www.mii.lt/na/issues/NA_1101/NA11102.pdf
2. www.math.xmu.edu.cn/school/teacher/bai/papers/thesis.pdf
3. http://www.sosmath.com/calculus/diff/der07/der07.html
4. www.macalester.edu/aratra/edition2/chapter3/chapt3a.pdf
5. www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT...2/node18.html

U6CSB20 C# AND .NET FRAMEWORK **L T P C**
3 0 0 3

Course Educational Objectives:

- The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the framework.
- The student will gain programming skills in C# both in basic and advanced levels.
- By building sample applications, the student will get experience and be ready for large- scale projects.

Prerequisite :

- Introduction to Computing
- Java Programming
- ASP.NET

Course Outcomes :

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

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain briefly about object oriented aspects of C#.	K2
CO2	Display proficiency in C# by building stand-alone applications in the .NET framework using C#.	K3
CO3	Create web-based distributed applications using C#, ASP.NET, SQL Server and ADO.NET	K3
CO4	Create distributed data-driven applications using the .NET Framework, C#, SQL Server and ADO.NET	K3

UNIT I INTRODUCTION TO C# **8**

Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data types, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations

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

Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions

UNIT III APPLICATION DEVELOPMENT ON .NET **8**

Building Windows Applications, Accessing Data with ADO.NET

UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET **8**

Programming Web applications with Web Forms, Programming Web Services

UNIT V THE CLR AND THE .NET FRAMEWORK **12**

Assemblies, Versioning, Attributes, Reflection, Viewing Meta Data, Type Discovery, Reflecting on a type, Marshalling, Remoting, Understanding Server Object Types, Specifying a server with an Interface, Building a server, Building the Client, Using Single Call, Threads.

TOTAL: 45 periods

Learning Resources:

Text Books

1. "Complete Reference C # .NET" "Mathew Mac Donald", Tata McGraw Hill Edition 2001.

2. "Microsoft ASP.NET 3.5 Step by Step", George Shepherd, Microsoft Press Edition

Reference Book

1. "**ASP.Net AJAX Programmer Reference 2.0",**

Online Resources

1. http://www.w3schools.com/c#net/default.asp
2. http://www.tutorialspoint.com/c#.net/
3. http://www.lynda.com/C #-NET-training-tutorials/157-0.html

U6CSB21 OBJECT ORIENTED ANALYSIS AND DESIGN **L T P C**
3 0 0 3

Prerequisite :

- Introduction to Computing
- Object Oriented Programming
- Data Structures & Algorithms
- Software Engineering and Project Management

Course Educational Objectives :

Students exposed to this course are able to

- Developing the object oriented methodologies.
- Analyze the relationships and responsibilities of objects and classes in UML.
- Develop the design and code for real time system.

Course Outcomes :

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

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain the basic principles of object oriented system and its life cycle.	K2
CO2	Explain different models of object analysis and apply uml notations to develop various uml diagrams for the given scenario.	K2
CO3	Apply different object oriented analysis schemes and identify object attributes , methods	K3
CO4	Explain the design process and variety of object oriented design practices	K2
CO5	Understanding of object oriented system to assure software quality.	K2

course content

UNIT I INTRODUCTION **9**

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Information hiding – Class hierarchy – Relationships – Associations – Aggregations- Identity – Dynamic binding – Persistence – Metaclasses – Object oriented system development life cycle.

UNIT II METHODOLOGY AND UML **9**

Introduction – Survey – Rumbugh, Booch, Jacobson methods – Patterns – Frameworks – Unified approach – Unified modeling language – Static and Dynamic models – UML diagrams – Class diagram – Usecase diagrams – Dynamic modeling – Model organization – Extensibility.

UNIT III OBJECT ORIENTED ANALYSIS **9**

Identifying Usecase – Business object analysis – Usecase driven object oriented analysis – Usecase model – Documentation – Classification – Identifying object, relationships, attributes, methods – Super-sub class – A part of relationships Identifying attributes and methods – Object responsibility

UNIT IV OBJECT ORIENTED DESIGN **9**

Design process – Axions – Cololllaries – Designing classes – Class visibility – Refining attributes – Methods and protocols – Object storage and object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface

UNIT V SOFTWARE QUALITY **9**

Quality assurance – Testing strategies – Object orientation testing – Test cases – Test Plan – Debugging principles – Usability – Satisfaction – Usability testing – Satisfaction testing.

TOTAL: 45 periods

TEXT BOOK

1. Ali Bahrami, “Object Oriented System Development”, McGraw Hill International Edition, 1999.

REFERENCE BOOKS

1. Craig Larman, Applying UML and Patterns, 2nd Edition, Pearson, 2002.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, “The Unified Modeling LanguageUser Guide”, Addison Wesley Long man, 1999.
3. Bernd Bruegge, Allen H. Dutoit, Object Oriented Software Engineering using UML, Patterns and Java, Pearson 2004

WEB REFERENCES

1. people.aub.edu.lb/~ws06/OOCourse.pdf
2. www.sts.tu-harburg.de/teaching/ws-98.99/OOA+D/entry.html
3. www.kinindia.com › Kin India › Anna University › CSE
4. users.csc.calpoly.edu/~csturner/courses/205/lecture9and10.ppt
5. www.freetechbooks.com › Object Oriented Programming

U6CSB22 ENTERPRISE JAVA & WEB SERVICES **L T P C**
3 0 0 3

.

Pre-requisites:

- Java Programming
- J2SE Lab
- Object Oriented Programming
- Object Oriented Programming Lab.

Course Educational Objective:

Students are exposed to:

- Basic Internet Protocols.
- JAVA and HTML tools for Internet programming.
- Scripting languages – Java Script.
- Dynamic HTML programming and Web services
- Server Side Programming tools

Course Outcomes:

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain Appropriate database Connectivity of Java and SQL for a web Application	K2
CO2	Discuss various services in Hibernate and Struts framework	K2
CO3	Design a static web page using HTML for the given Applicaion	K3
CO4	Design a Dynamic web page using DHTML and JavaScript for the given web application	K3
CO5	Demonstrate Programs using XML and AJAX	K2

Course content:

UNIT I **9**

TCP and Datagram Sockets – Remote Method Invocation - Servlets, Java Server Pages .– JDBC - Java Beans – Enterprise Java Beans .

UNIT II **9**

Java Security – Native Methods – Java Virtual Machine - Naming Services – Java Mail – Java Messaging Services – Transactions- Introduction to struts Frame work .

UNIT III **9**

Introduction to hibernate – Hibernate, HQL – J2EE(struts) and hibernate –Hibernate and AspectJ – Birt Reporting Tool. Introduction – Network concepts - Web concepts – Internet addresses – URL – Retrieving. Data with URL - CGI – Introduction to HTML – HTML protocols – HTTP, SMTP, POP3, MIME, IMAP – Forms – Events – CSS – Introduction – Basics- CSS Styling- CSS Grouping.

UNIT IV **9**

DHTML - Introduction – Object refers, Collectors all and Children. Dynamic style, Dynamic position, frames - Navigator– Creating Images - Data Binding. Introduction to JAVA Scripts – Object Based Scripting for the web. Structures – Functions – Arrays – Objects

UNIT V **9**

Introduction – XML Syntax & rules – DTD – Data Binding – XML link- style language – converting HTML to XML – parsers DOM – SAX – Java & XML – Introduction to Web services - DOM – Web Security.

TOTAL: 45 periods

Learning resources

Text Books:

1. Harvey & Paul Deitel & Associates (Author), Harvey Deitel (Author), Abbey Deitel "Internet and World Wide Web How To Program ",5th Edition.

Reference Books:

1. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999.
2. Elliotte Rusty Harold, "Java Network Programming", O'Reilly Publishers, 2002

Online Resources:

1. Eric Ladd, Jim O' Donnel, "Using HTML 4, XML and JAVA", Prentice Hall of India – QUE, 1999.
2. http://www.w3schools.com/ajax/
3. http://www.java-samples.com/java-beans/
4. http://www.tutorialspoint.com/php/
5. http://ajax.net-tutorials.com/

U6ITB09 CASE TOOLS LAB **L TP C**
(common for CSE, IT) **0 0 3 2**

Prerequisite : DBMS Lab

Course Educational Objectives :

Students undergoing this course are expected to

- Do Program Analysis and Project Planning.
- Do Software requirement Analysis and data modeling
- Do Software Development , Debugging and Testing

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Identify project scope, Objectives, infrastructure	K2
CO2	Describe the individual modules of the project	K2
CO3	Make design with modelling diagrams and add interface to class diagrams.	K3
CO4	Demonstrate software development.	K3
CO5	Perform a different software testing methods	K2

Course Content

1. Prepare the following documents for two or three of the experiments listed below and develop the software engineering methodology.
2. Program Analysis and Project Planning. Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
3. Software requirement Analysis Describe the individual Phases / Modules of the project, Identify deliverables.
4. Data Modeling Use work products – Data dictionary, Use diagrams and activity diagrams, build and test lass diagrams, Sequence diagrams and add interface to class diagrams.
5. Software Development and Debugging
6. Software Testing Prepare test plan, perform validation testing, Coverage analysis, memory leaks, develop test case hierarchy, Site check and Site monitor.

List of Applications:

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance

Text Book

1. Martin Forwler, Kendall Scott. "UML distilled-Applying the standard object modelling language", Addison Wesley, 1997.
2. Richard C lee, William M Tepfenhart, "UML and C++ - A practical guide to object oriented development", Prentice Hall, 1997.

Reference Books

1. Grady Booch, "Object Oriented Analysis and design with applications" II edition Addison Wesley, 1994.

2.Roger. S. Pressman, “Software Engineering – A Practitioner’s Approach”, sixth Edition, McGraw Hill ,International Edition, Singapore, 2006.

Online Resources:

1.www.ibm.com/software/rational/uml/

2.sourcecodesonline.blogspot.com/.../railway-ticket-reservation-case-tools....

U6CSB23 WEBSERVICES LAB **L T P C**
0 0 3 2

Course Educational Objectives :
Students undergoing this course will be provided with:

- To install and configure web services infrastructure and framework for developing/delivering web services using the Java programming language.
- To deploy a simple Java web service, invoke this service using a Java web services client .

Course Outcomes :
Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Create a web application using the following languages: HTML, CSS, JavaScript, JSP, java, and SQL.	K2
CO2	Describe the benefits of new technologies such as java script function library that provides client-side/browser animations, java beans (java objects that persist between pages), AJAX (partial page refresh), web services (class methods that can be called over the internet).	K2
CO3	Develop XML Programs.	K3
CO4	Demonstrate programs using PHP and CSS.	K3

J2EE:

1. Develop static pages (using Only HTML) of an online Bookstore. The pages should resemble: www.amazon.com. The website should consist the following pages.

Home page, Registration and user Login, User Profile Page, Books catalog, Shopping Cart,
Payment By credit card, Order Conformation

2. Validate the Registration, user login, user profile and payment by credit card pages using
JavaScript.

3. Create and save an XML document at the server, which contains 10 users information. Write a
program, which takes User Id as an input and returns the user details by taking the user information from the XML document.

4.BeanAssignments
a.Create a Java Bean which gives the exchange value of INR (Indian Rupees) into equivalent American/Canadian/Australian Dollar value.

b. Create a simple Bean with a label - which is the count of number of clicks. Then create a Bean
Info class such that only the "count" property is visible in the Property Window.

5. Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies. Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

6. Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.

7. Implement the "Hello World!" program using JSP Struts Framework.

Web services:

1.Design a Web page Using HTML
2.Design a Web page Using DHTML
3. Write a Simple program using Java Script
4. Write a simple program using CSS
5. Write a simple program using CSS and xml
6. Write a simple program using CSS and PHP
7. Write a simple program using PHP
8. Write a simple program using XML.

Learning resources

i. Text Books:

1."Internet and World Wide Web How To Program "5th Edition by Harvey & Paul Deitel & Associates (Author), Harvey Deitel (Author), Abbey Deitel

ii. Refernce Books:

1. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999.
2. Elliotte Rusty Harold, "Java Network Programming", O'Reilly Publishers, 2002

iii. Online Resources:

6. Eric Ladd, Jim O' Donnel, "Using HTML 4, XML and JAVA", Prentice Hall of India – QUE, 1999.
7. http://www.w3schools.com/ajax/
8. http://www.java-samples.com/java-beans/
9. http://www.tutorialspoint.com/php/
10. http://ajax.net-tutorials.com/

U6CSB24 C # AND .NET LAB **L T P C**
0 0 3 2

Prerequisite : DBMS Lab

Course Educational Objectives :

Students undergoing this course are expected to

- Do Program Analysis and Project Planning.
- Do Software requirement Analysis and data modeling
- Do Software Development , Debugging and Testing

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Implement the basic concepts of C#.	K2
CO2	Demonstrate the concepts of Object Oriented Concepts in C#	K2
CO3	Develop Graphical User Interface and work with database	K3

Course Content :

1. Implémentation of control statement, operator in C#
2. Implémentation of pointers, arrays, delegates, enumeration, output parameter in C#
3. Implementation of menus (dropdown , popup , toolbar , status bar , menu bar)
4. Implementation of inheritance , interface , exception handling concepts
5. Implementation of overloading and overriding
6. Implementation of multi threading
7. Implementation of files and streams
8. Implementation of notepad creation
9. ADO.NET using
    a. console application
    b. Data Reader
    c. Data adapter and dataset
10. Database design and implementation (Mini Project).

Text Books

1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004. Second Edition
2. J. Liberty, "Programming C#", 2nd ed., O'Reilly, 2002.
3. Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.
4. Deitel Deitel List Field Yaeger Zlatkina "C# HOW TO PROGRAM".

Reference Books

1. Robinson et al, "Professional C#", 2nded., Wrox Press, 2002.
2. Andrew Troelsen, "C# and the .NET Platform", A! Press, 2003.
3. Christian Nagel ,Bill Evjen,Jay glynn,Morgan Skinner "Professional C# 2005".

Online Resoures:

1. http://www.c-sharpcorner.com/beginners/
2.www.tutorialspoint.com/csharp/
3. WWW. W3schools.com

SEMESTER VII

U7CSB25 DATA WAREHOUSING AND MINING **L T P C**
3 0 0 3

Preamble:
Data warehousing and data mining is one of the most advanced fields of computer science which involves use of Mathematics, Statistics, Information Technology and information Sciences in discovering new information and knowledge from large databases It is a new emerging interdisciplinary area of research and development which has created interest among scientists of various disciplines like computer science, mathematics, statistics, information technology etc

Course Educational Objectives:

Students undergoing this course are expected to

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

Course Outcomes:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the concepts of data warehouse.	K2
CO2	Analyze OLAP tools	K2
CO3	Apply Data mining techniques and methods on large data sets.	K3
CO4	Compare and contrast classification and prediction techniques	K3
CO5	Explain data mining tools on various applications	K2
CO 6	Understand the basics of big data analytics	K2

Pre-requisites:

- Database Management system

Course content

UNIT IDATA WAREHOUSING **9**

Data warehousing Components –Building a Data warehouse –DataMarting – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools – Metadata.

UNIT IIBUSINESS ANALYSIS 9

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

UNIT IIIDATA 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 –Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification–Prediction

UNIT VCLUSTERING AND APPLICATIONS AND TRENDS IN DATA MINING 9

Cluster Analysis - Types of Data – Categorization of Major Clustering Methods – Kmeans – Partitioning Methods – Hierarchical Methods–Outlier Analysis – Data Mining Application-Web Mining-Text Mining – Introduction to Big Data Analytics- Business Intelligence.

TOTAL: 45 periods

Text Books:

1. Alex Berson and Stephen J. Smith, " Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Third Edition, MK, 2011.

Reference Books:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, " Introduction To Data Mining", Person Education, Second Edition, 2013.
2. K.P. Soman, Shyam Diwakar and V. Ajay," Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, " Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Daniel T.Larose, "Data Mining Methods and Models", Wile-Interscience, 2006

Online Resources:

1. *www.dei.unipd.it/~capri/SI/MATERIALE/DWDM0405.pdf*
2. www.cs.gsu.edu/~cscyqz/courses/dm/dmlectures.html
3. www.edunotes.in/datawarehousing-and-data-mining-notes
4. iiscs.wssu.edu/drupal/node/3394
5. cde.annauniv.edu/MCAQP/pdf/...2010/.../DMC1628-2010.pdf
6. www.kodaitech.edu.in/mykit%20documents/CS2032.pdf
7. itcloud.net46.net/cs2032-data-warehousing-and-data-mining-notes-unit-iv/
8. civilsoftwares.com/tag/cs2032-data-warehousing-and-data-mining/

U7CSB26 MOBILE COMMUNICATION AND COMPUTING **L T P C**
(common for CSE, IT) **3 0 0 3**

Course Educational Objectives:

Students undergoing this course are expected to

- To learn the basics of Wireless voice and data communications technologies.
- To build working knowledge on various telephone and satellite networks.
- To study the working principles of wireless LAN and its standards.
- To build knowledge on various Mobile Computing algorithms.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

Course Outcomes:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the basics of wireless communication systems.	K2
CO2	Demonstrate the concepts of Telecommunication networks	K3
CO3	Design wireless LAN.	K3
CO4	Develop and demonstrate various routing protocols.	K3
CO5	Explain Wireless application Protocols to develop mobile content application and to appreciate the social and ethical issues of mobile computing, including privacy.	K2

Pre-requisites:

- Data communications and computer networks

Course Content:

UNIT I Wireless Communication Fundamentals **9**

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

UNIT II Telecommunication Networks **9**

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT-2000 – Satellite Networks - Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

UNIT III Wireless LAN **9**

Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – HIPERLAN – Blue Tooth.

UNIT IV Mobile Network Layer **9**

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics.

UNIT V Transport and Application Layers **9**

Traditional TCP – Classical TCP improvements – WAP, WAP 2.0.

TOTAL: 45periods

Text Books

1. Jochen Schiller, "Mobile Communications", PHI/Pearson Education, Second Edition, 2003.
   (UNIT I Chap 1,2 &3- UNIT II chap 4,5 &6-UNIT III Chap 7.UNIT IV Chap 8-UNIT V Chap 9&10.)
2. William Stallings, "Wireless Communications and Networks", PHI/Pearson Education, 2002. (UNIT I Chapter – 7&10-UNIT II Chap 9)

Reference Books

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, New York, 2003.
3. Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and Sons Ltd, 2002.

Online Resources

1. http://forum.jntuworld.com/showthread.php?6087-Mobile-Computing-Notes-All-units-(Including-exercises)
2. www.cise.ufl.edu/class/cen5531fa06/notes/intro-mobilecomputing.pdf
3. www.edunotes.in/mobile-computing
4. freecomputerbooks.com/networkWirelessBooks.html
5. notesengine.com/dept/cse/7sem/anna_university_7_sem_cse_mpc.html

U7CSB27 INFORMATION STORAGE MANAGEMENT **L T P C**
3 0 0 3

Course Educational Objective

- Evaluate storage architectures, including storage subsystems, DAS, SAN, NAS, and CAS. Define backup, recovery, disaster recovery, business continuity, and replication.
- Examine emerging technologies including IP-SAN.
- Understand logical and physical components of a storage infrastructure.
- Identify components of managing and monitoring the data center.
- Define information security and identify different storage virtualization technologies.

Course Outcomes:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the data storage technologies and storage system environment	K2
CO2	Apply the RAID concepts for data protection and explain the working of intelligent storage system.	K3
CO3	Discuss about different network storage and content addressed storage.	K2
CO4	Describe the storage virtualization techniques and Information Availability & Monitoring & Managing Datacenter	K2
CO5	Explain the storage security ,infrastructure and Disaster Recovery	K2

Pre-requisite

- Operating Systems
- Digital system and principal design
- Database Management system

Course content

UNIT I **9**

Introduction to Information Storage Technology

Review data creation and the amount of data being created and understand the value of data to a business, Challenges in Data Storage and Management, Data Storage Infrastructure. **Storage Systems Environment:** Components of a Storage System Environment: Disk drive Components, Disk Drive Performance, Logical Components.

UNIT II **9**

Data protection: Concept of RAID and its Components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Comparison of Levels. **Intelligent Storage Systems;** Components, Intelligent Storage Array, High-level architecture and working of an intelligent storage system.

UNIT III **9**

Introduction to Networked Storage: Evolution of networked storage, Architecture, Overview of FC-SAN, NAS, and IP-SAN. Network-Attached Storage (NAS): Benefits of NAS, Components, Implementations, File Sharing, I/O operations, Performance and Availability. **Content Addressed Storage (CAS):** features and Benefits of a CAS. CAS Architecture, Storage and Retrieval, Examples.

UNIT IV **9**

Storage Virtualization: Forms, Taxonomy, Configuration, Challenges, Types of Storage Virtualizations. **Information Availability & Monitoring & Managing Datacenter:** Information Availability, Business continuity, Failure Analysis, Business impact Analysis, Differentiate between business continuity (BC) and disaster recovery (DR).

UNIT V **9**

Disaster Recovery: Backup, Methods, And Technologies, Replication technologies: Local replicas, Technologies, Restore and Restart, Multiple Replicas. Remote Replication. DR in practice. **Storage Security and Management**: Security Framework, Storage security domains, List and analyzes the common threats in each domain, Security Implementations. **Managing the Storage Infrastructure:** Monitoring the Storage Infrastructure, Storage Management Activities, Challenges and solutions.

TOTAL: 45 periods

TEXT BOOKS

1. Stephen Haag and Maeve Cummings, ”Information Systems Essentials, II Edition, Mc-graw /Irwin 2008.
2. Ralph Stair “principles of information Systems, VI edition, 2003.

7.2 REFERENCE BOOK

1. Harold koontz and Heinz Weirich,” Essentials of management” ,fifth edition, Tata McGraw Hill,1998

WEB REFERENCES

1. www.cs.washington.edu/education/courses/cse341/95au/.../storage.ht...
2. education.emc.com › Home › Training › Learning Paths
3. www.faadooengineers.com › ... › FaaDoOEngineers.com Recycle Bin
4. www.cs.cmu.edu/~fp/**course**s/15312-f03/handouts/18-**storage**.pdf

U7CSB28 CRYPTOGRAPHY AND NETWORK SECURITY **L T P C**
3 1 0 4

Preamble:

This course describes the explosive growth in computer systems and their interconnections via networks, has increased the dependence of both organizations and individuals on the information stored and communicated using these systems. This, in turn, has led to a heightened awareness of the need to protect data and resources from disclosure, to guarantee the authenticity of data and messages, and to protect systems from network-based attacks and the disciplines of cryptography and network security have matured, leading to the development of practical, readily available applications to enforce network security.

Course Educational Objectives:

Students undergoing this course are expected to

- Learn fundamentals of cryptography and its application to network security.
- Understand network security threats, security services, and countermeasures.
- Acquire background on well known network security protocols such as IPSec, SSL, and WEP.
- Understand vulnerability analysis of network security.
- Acquire background on hash functions; authentication; firewalls; intrusion detection techniques.

Course Outcomes:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Compare various Cryptographic Techniques	K3
CO2	Demonstrate various data encryption techniques.	K3
CO3	Implement Hashing and Digital Signature techniques	K3
CO4	Explain the various Security Application	K2
CO5	Design and implement Secure applications	K3

Pre-requisites:

NIL

Course Content:

UNIT I INTRODUCTION **9**

OSI Security Architecture - Classical Encryption techniques - Cipher Principles - Data Encryption Standard - Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES - AES Cipher - Triple DES - Placement of Encryption Function - Traffic Confidentiality

UNIT II PUBLIC KEY CRYPTOGRAPHY 9

Key Management - Diffie-Hellman key Exchange - Elliptic Curve Architecture and Cryptography - Introduction to Number Theory - Confidentiality using Symmetric Encryption - Public Key Cryptography and RSA.

UNIT III AUTHENTICATION AND HASH FUNCTION 9

Authentication requirements - Authentication functions - Message Authentication Codes - Hash Functions - Security of Hash Functions and MACs - MD5 message Digest algorithm - Secure Hash Algorithm - RIPEMD - HMAC Digital Signatures - Authentication Protocols - Digital Signature Standard

UNIT IV NETWORK SECURITY 9

Authentication Applications: Kerberos - X.509 Authentication Service - Electronic Mail Security - PGP - S/MIME - IP Security - Web Security.

UNIT V SYSTEM LEVEL SECURITY 9

Intrusion detection - password management - Viruses and related Threats - Virus Counter measures - Firewall Design Principles - Trusted Systems.

TOTAL: 45+(15 Tutorials)=60 Periods

Learning Resources

Text Books:

1. Wade Trappe, Lawrence C Washington, " Introduction to Cryptography with coding theory", 2nd ed, Pearson, 2007.
2. William Stallings, "Cryptography and Network security Principles and Practices", Pearson/PHI, 4th ed, 2006.

Reference Books:

1. W. Mao, "Modern Cryptography – Theory and Practice", Pearson Education, Second Edition, 2007.
2. Charles P. Pfleeger, Shari Lawrence Pfleeger – Security in computing Third Edition – Prentice Hall of India, 2006.

Online Resources:

1. williamstallings.com/Extras/**Security-Notes**/
2. cs.brown.edu/**course**s/csci1510/.../goldwasser_bellare_**notes**.pdf
3. www.cs.bilkent.edu.tr/~selcuk/teaching/cs519/
4. freevideolectures.com › Computer Science › IIT Kharagpur

U7CSB29 ASP.NET LAB **L T P C**
0 1 3 3

COURSE EDUCATIONAL OBJECTIVES

Students undergoing this course are expected to

- To learn the basic validation script in ASP.Net.
- To understand the session state and view state
- Students can understand the programs connected with database

COURSE OUTCOMES

Students undergoing this course are able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Effectively use visual studio .NET	K3
CO2	An understanding of the goals and objectives of the .NET Framework. .NET is a revolutionary concept on how software should be developed and deployed.	K3
CO3	A working knowledge of the C# programming language.	K3
CO4	An understanding of how to use forms to develop GUI programs under .NET	K2
CO5	Knowledge of some of the tools available in the .NET Framework class library.	K3

PREREQUISITE

- Java Programming

COURSE CONTENT

UNIT I

Introducing VB .NET - Form object - Introduction to data types in VB - The user interface and control names - The Visual Basic code - Modules and scopes - VB .NET functions - Class Libraries - Interfaces & Abstract Classes - Delegates and Events - Intrinsic controls in VB .NET - User interface design (MDI & SDI Models).

UNIT II

ASP.Net web Server Controls-Web Control Classes-Validation and Rich Controls-Custom Composite Controls- User Control. ASP.Net State Management- View State-Custom Cookies- Session State-Session Tracking-Session State Configuration-ASP.Net Security-SSL- Forms Authentication-Windows Authentication- ADO.Net Introduction- Data Binding – Accessing Database-ADO.Net Data Access- ADO.Net with LINQ.

UNIT III

Web Services- Enterprise Services-Deployment-.Net Remoting-ASP.Net Personalization and Localization - AJAX Introduction-ASP.Net Server Side Support for AJAX-AJAX Client Side Support-Custom Controls- Handler and Session State-Generic Handlers (ASHX Files)-ASP.Net Master Pages- Themes-Skins.

TEXT BOOKS

1. Bill Sheldon, Billy Hollis, Rob Windsor, David McCarter, Gastón Hillar, Todd Herman, Professional Visual Basic 2012 and .NET 3.5 Programming, Paperback Publisher, 2012.
2. "Microsoft ASP.NET 3.5 Step by Step", George Shepherd, Microsoft Press Edition, 2010.
3. "Complete Reference ASP.NET" "Mathew Mac Donald", Tata McGraw Hill Edition 2001.

REFERENCE BOOK

1. "ASP.Net AJAX Programmer Reference 2.0",

VB . NET LAB

1. Design a Logon form and validate it and Design a form to create a digital clock
2. Design a traffic signal application
3. Design a form to open and save files using menus
4. Design a application for student information system using ADO.NET.

ASP.NET LAB

1. Implement Validation Controls
2. Write a Program to implement Custom Composite Control
3. Write a Program to implement User Control
4. Write a Program to implement view State and Session State.
5. Write a Program to implement ASP.Net Security (Windows Authentication, Forms Authentication)
6. Write a Program to implement ASP.Net Server Side Controls.
7. Write a Program to implement ASP.Net Master Pages,Themes and Skins.
8. Write a Program to implement Handlers and Session State.
9. Write a Program to implement Custom Handlers.
10. Write a Program to implement AJAX Client Side Support.

U7CSB30 BUSINESS COMMUNICATION LAB **L T P C**
0 0 3 2

COURSE EDUCATIONAL OBJECTIVES

Students undergoing this course are able to

- Learn the body language and mock interviews using training sessions
- Analyze the various audio and video samples using presentation skills
- Implement the team building activity using various leadership and managerial skills.

COURSE OUTCOMES

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Improve upon the phonetic pronunciation and actual feeling of the subject.	K2
CO2	Understand, and prepare them to face the soft skills requirements and challenges of corporate world.	K2
CO3	Improve upon their language skills, oral communication skills, group discussion, global world culture, personal development and confidence level.	K2
CO4	Learn to communicate effectively and to think creatively and critically, both independently and with others	K2

PREREQUISITES

- Nil

COURSE CONTENT

UNIT I GROUP DISCUSSION

Why is GD part of selection process ? -Structure of GD – Moderator – led and other GDs -Strategies in GD – Team work -Body Language -Mock GD -Video samples

UNIT II INTERVIEW SKILLS

Kinds of interviews – Required Key Skills – Corporate culture – Mock interviews- Video samples

UNIT III PRESENTATION SKILLS

Elements of effective presentation – Structure of presentation -Presentation tools – Voice Modulation – Audience analysis -Body language – Video samples-oral presentation-delivery methods and handling of stage fear.

UNIT IV TEAM BUILDING

Understanding the role of Teams in Organizations- Pursuing Team Leadership- Preparing to be a Team Partner- Getting Started with your Team- Managing a Team Diplomatically-Concluding Team Activities.

UNIT V WRITING FOR EMPLOYMENT

Writing a resume - Accepting /Rejecting job offers- Teaching at work- Professional Net Working Sites - Web Conferencing

LEARNING RESOURCES

REFERENCE BOOKS

1. Thorpe, E, and Thorpe, S, **Objective English**, Pearson Education, Second Edition, New Delhi, 2007.
2. Anderson, P.V, **Technical Communication**, Thomson Wadsworth, Sixth Edition, New Delhi, 2007.
3. Butterfield , Jeff, **Soft Skills For Everyone.** cegage learning, Canada,2011

U7CSB31 MINI PROJECT **L T P C**
0 0 3 2

COURSE EDUCATIONAL OBJECTIVE

Students undergoing this course are expected to

- Choose any project of solving social problems
- Team Project with a maximum of three in a team
- Need to concentrate on software development methodologies
- Documentation is based on the standards

COURSE OUTCOMES

Students undergoing this course are able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Understand programming language concepts, particularly Java and object-oriented concepts	K2
CO2	Demonstrate independent learning	K2
CO3	Demonstrate the ability to locate and use technical information from multiple sources.	K2
CO4	Demonstrate an understanding of professional ethics. Participate in a class or project team	K2

Mini Project Titles

1. Hotel Management System
2. Advertisement Agency
3. ATM Systems
4. Vehicle Management System
5. Telecom Business Management System
6. Online Crime Record Management System
7. New Method of Cryptography
8. Library Management System
9. Hospital Management system
10. Human Resource Management
11. Pharmacy Management
12. Traveler (an android app.)
13. Visa Processing and Management
14. Insurance Management System
15. Gas Agency System
16. Airline Reservation System
17. Payroll System
18. Transportation Management System

VIII SEMESTER

U8CSB32 PROJECT WORK **L TP C**
0 024 12

ELECTIVE LIST

UEEEB42 EMBEDDED SYSTEM DESIGN **L T P C**
3 0 0

Course Educational Objectives:

- To introduce students to the embedded systems, its hardware and software.
- To introduce devices and buses used for embedded networking.
- To explain programming concepts and embedded programming in C and C++.

. Course Outcomes

Students undergoing this course are able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain about Various Registers and memory Devices	K2
CO2	Describe About Cache and Memory Management Functions	K2
CO3	Explain Various types of Buses and Device Drivers	K2
CO4	Explain I/O Instruction Mechanism	K2
CO5	Describe Various Real time Operating Systems	K2

Pre-requisites:

- Microprocessors and Microcontrollers
- Computer Organization and architecture

Course Content:

UNIT IINTRODUCTION TO EMBEDDED SYSTEM **9**

Introduction to functional building blocks of embedded systems – Register, memory devices, ports, timer, interrupt controllers using circuit block diagram representation for each categories**.**

UNIT II PROCESSOR AND MEMORY ORGANIZATION **9**

Structural units in a processor; selection of processor & memory devices; shared memory; DMA; nterfacing processor, memory and I/O units; memory management – Cache mapping techniques, dynamic allocation - Fragmentation.

UNIT III DEVICES & BUSES FOR DEVICES NETWORK **9**

I/O devices; timer & counting devices; serial communication using I^2C, CAN, USB buses; parallel communication using ISA, PCI, PCI/X buses, arm bus; interfacing with devices/ports, device drivers in a system – Serial port & parallel port.

UNIT IVI/O PROGRAMMING SCHEDULE MECHANISM 9

Intel I/O instruction – Transfer rate, latency; interrupt driven I/O - Non-maskable interrupts; software interrupts, writing interrupt service routine in C & assembly languages; preventing interrupt overrun; disability interrupts. Multi threaded programming – Context switching, premature & non-premature multitasking, semaphores. Scheduling – Thread states, pending threads, context switching, round robin scheduling, priority based scheduling, assigning priorities, deadlock, watch dog timers.

UNIT VREAL TIME OPERATING SYSTEM (RTOS) 9

Introduction to basic concepts of RTOS, Basics of real time & embedded system operating systems, RTOS – Interrupt handling, task scheduling; embedded system design issues in system development process – Action plan, use of target system, emulator, use of software tools.

TOTAL: 45 Periods

Text Books

1. Rajkamal, 'Embedded System – Architecture, Programming, Design', Tata McGraw Hill, 2003.
2. Daniel W. Lewis 'Fundamentals of Embedded Software', Prentice Hall of India, 2004.

Reference Books

1. David E. Simon, 'An Embedded Software Primer', Pearson Education, 2004.
2. Frank Vahid, 'Embedded System Design – A Unified hardware & Software Introduction', John Wiley, 2002.
3. Sriram V. Iyer, Pankaj Gupte, 'Embedded Real Time Systems Programming', Tata McGraw Hill, 2004.
4. Steve Heath, 'Embedded System Design', II edition, Elsevier, 2003.

Web References

1. www.react.uni-saarland.de/.../**embedded-systems**-08.../**lecture-notes**.h...
2. www.stanford.edu/class/ee281/**lectures**.html
3. ebookmaterials.blogspot.com/.../**embedded-system-design**-and-practi...
4. www.cs.columbia.edu/~sedwards/classes/2012/4840/index.html

UECSB33 REAL TIME SYSTEMS **L T PC**
3 00 3

Course Educational Objectives:

Students undergoing this course are expected to:

- To know about the specification and design techniques of a Real Time System.
- To understand about real time task communication and synchronization
- To have a vast knowledge of queuing models and Real Time System integration

Course Outcomes

Students undergoing this course are able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Distinguish a real-time system from other systems	K2
CO2	Identify the functions of operating system	K2
CO3	Understand basic multi-task scheduling algorithms for periodic, aperiodic, and sporadic tasks as well as understand the impact of the latter two on scheduling	K2
CO4	Understand capabilities of at least one commercial off-the-shelf R-T kernel	K2
CO5	Explain the relevant literature and research trends of real-time systems.	K2

Pre-requisites:

- Operating System
- Data Base management Systems

Course Content:

UNIT I Introduction **9**

Introduction - Issues in Real Time Computing, Structure of a Real Time System. Task Classes, Performance Measures for Real Time Systems, Estimating Program Run times. Task Assignment and Scheduling - Classical Uniprocessor scheduling algorithms, UniProcessor scheduling of IRIS Tasks, Task Assignment, Mode Changes, and Fault Tolerant Scheduling.

UNIT II Programming Languages and Tools **9**

Programming Language and Tools – Desired Language characteristics, Data Typing, Control structures, Facilitating Hierarchical Decomposition, Packages, Run-time (Exception)

Error handling, Overloading and Generics, Multitasking, Low Level programming, Task scheduling, Timing Specifications, Programming Environments, Run-time Support.

UNIT III Real Time Databases **9**

Real time Databases - Basic Definition, Real time Vs General Purpose Databases, Main Memory Databases, Transaction priorities, Transaction Aborts, Concurrency Control Issues, Disk Scheduling Algorithms, Two-phase Approach to improve Predictability, Maintaining Serialization Consistency, Databases for Hard Real Time systems.

UNIT IV Communication **9**

Real-Time Communication - Communications Media, Network Topologies Protocols, Fault Tolerant Routing. Fault Tolerance Techniques - Fault Types, Fault Detection. Fault Error containment Redundancy, Data Diversity, Reversal Checks, Integrated Failure handling.

UNIT V Evaluation Techniques **9**

Reliability Evaluation Techniques - Obtaining Parameter Values, Reliability Models for Hardware Redundancy, Software Error models. Clock Synchronization - Clock, A Nonfault-Tolerant Synchronization Algorithm, Impact of Faults, Fault Tolerant Synchronization in Hardware, Fault Tolerant Synchronization in Software

TOTAL: 45 periods

Text Books

1. Real-Time Systems, Jane Liu, Prentice Hall, 2000
2. C.M. Krishna, Kang G. Shin, “Real-Time Systems”, McGraw-Hill International Editions, 2010.

Reference Books

1. Stuart Bennett, “Real Time Computer Control-An Introduction”,Second edition Perntice Hall PTR, 1994.

2. Peter D. Lawrence, “Real time Micro Computer System Design – An Introduction”, McGraw Hill, 2008.
3. S.T. Allworth and R.N. Zobel, “Introduction to real time software design”, Macmillan,II Edition, 2012.
4. Philip.A.Laplante “Real Time System Design and Analysis” PHI , III Edition, April 2010.

Web References

1. www.cse.chalmers.se/edu/course/EDA222/lectures.html
2. www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv468-P...
3. www.cs.wustl.edu/~fredk/Courses/cse522/fall03/notes.html
4. home.iitj.ac.in/~sk/RTOS-LECTURES/RTOS_Lecture2.pdf

UECSB34 INFORMATION SECURITY **L T P C**
3 0 0 3

. Course Educational Objective
Students undergoing this course are expected to:

- **Understanding the basics of Information Security**
- **Study of legal, ethical and professional issues in Information Security**
- **Study the technological aspects of Information Security**

Course Outcomes:
Students undergoing this course are able to:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain network security threats and countermeasures.	K2
CO2	Identify and explain symmetric algorithms for encryption-based security of information.	K2
CO3	Identify and explain public-key based asymmetric algorithms for encryption-based security of information.	K2
CO4	Examine the issues related to administration security, physical security, and program security.	K2
CO5	Determine appropriate mechanisms for protecting information systems ranging from operating systems to database management systems and to applications	K2

Prerequisite

- Software Engineering and project Management

Course content

UNIT I INTRODUCTION **9**

History, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II SECURITY INVESTIGATION **9**

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

UNIT III SECURITY ANALYSIS **9**

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV LOGICAL DESIGN **9**

Blueprint for Security, Information Security Poicy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V PHYSICAL DESIGN **9**

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Cotrol Devices, Physical Security, Security and Personnel

TOTAL: 45 periods

Learning Resources

Text Book

1. Michael E Whitman and Herbert J Mattord, “Principles of Information Security”, Vikas Publishing House, New Delhi, 2012

Reference Books

1. Micki Krause, Harold F. Tipton, “ Handbook of Information Security Management”, Vol 1-3 CRC Press LLC, 2004.
2. Stuart Mc Clure, Joel Scrambray, George Kurtz, “Hacking Exposed”, Tata McGraw-Hill, 2003
3.Matt Bishop, “ Computer Security Art and Science”, Pearson/PHI, 2002

Web References

1. www.edunotes.in/Home
2. www.yolearn.net › TNEA 2012
3. www.faadooengineers.com/.../389-INFORMATION-SECURITY-Ebo...
4. ceng520.cankaya.edu.tr/course.php?page=Lecture%20Notes

UECSB35 USER INTERFACE DESIGN **L T P C**
3 0 0 3

Course Educational Objective
Students undergoing this course are expected to

- To study the concept of menus, windows, interfaces.
- To study about business functions.
- To study the characteristics and components of windows.
- To study the various controls for the windows.
- To study about various problems in windows design with color, text, graphics.
- To study the testing methods

Course Outcomes:
Students undergoing this course are able to

CO Nos	**Course Outcomes**	**Level of learning domain (Based on revised Bloom's taxonomy)**
CO1	Understand the concept of usability, design principles, guidelines, heuristics and other fundamentals of Human-Computer Interaction.	K2
CO2	Analyse a set of requirements in terms of its user-interface implications	K2
CO3	Demonstrate knowledge of different interaction styles	K3
CO4	Demonstrate knowledge about some interaction design patterns and their applicability	K3
CO5	Develop a usage scenario for a given set of user requirements and available technologies.	K3

Prerequisite

- Java Programming
- Database management Systems

Course content

UNIT I INTRODUCTION **8**

Human–Computer Interface – Characteristics Of Graphics Interface –Direct Manipulation Graphical System – Web User Interface –Popularity –Characteristic & Principles.

UNIT II HUMAN COMPUTER INTERACTION **10**

User Interface Design Process – Obstacles –Usability –Human Characteristics In Design – Human Interaction Speed –Business Functions –Requirement Analysis – Direct – Indirect Methods – Basic Business Functions – Design Standards – System Timings –Human Consideration In Screen Design – Structures Of Menus – Functions Of Menus– Contents Of Menu– Formatting – Phrasing The Menu – Selecting Menu Choice– Navigating Menus– Graphical Menus.

UNIT III WINDOWS **9**

Characteristics– Components– Presentation Styles– Types– Managements– Organizations– Operations– Web Systems– Device– Based Controls Characteristics– Screen – Based Controls – Operate Control – Text Boxes– Selection Control– Combination Control– Custom Control– Presentation Control.

UNIT IV MULTIMEDIA **9**

Text For Web Pages – Effective Feedback– Guidance & Assistance– Internationalization– Accesssibility– Icons– Image– Multimedia – Coloring.

UNIT V WINDOWS LAYOUT– TEST **9**

Prototypes – Kinds Of Tests – Retest – Information Search – Visualization – Hypermedia – WWW– Software Tools.

TOTAL: 45 periods

Learning Resources
Text Books

1. Wilbent. O. Galitz ,“The Essential Guide To User Interface Design”, John Wiley& Sons, 2001.
2. Ben Sheiderman, “Design The User Interface”, Pearson Education, 1998.

Reference Books

1. Alan Cooper, “The Essential Of User Interface Design”, Wiley – Dream Tech Ltd., 2002.
2. Lidwell, W., Holden, K., Butler, J., & Elam, K. (2010).Universal principles of design, Mass:
Rockport Publishers.
3. Visocky, O. G. J., & Visocky, O. G. K. (2008).The information design handbook. Cincinnati, Ohio:

web Reference

1. www.iannauniversity.com/.../it2024-**user-interface-design**-u...
2. www.cramster.com › ... › software design › resource › lecture note
3. www.aw-bc.com/DTUI3/lec**notes**.doc.
4. https://www.cosc.brocku.ca/~bockusd/3p94/webui1.pdf

UECSB36 HIGH SPEED NETWORKS **L T P C**
3 0 0 3

Course Educational Objectives:

Students undergoing this course are expected to

- Demonstrate the knowledge of network planning and optimization
- Develop an in-depth understanding, in terms of architecture, protocols and applications, of major high-speed networking technologies
- Evaluate various technologies and identify the most suitable one to meet a given set of requirements for a hypothetical corporate network
- Develop necessary background to be able to manage projects involving any of the high-speed networking technologies

Course Outcomes :

Students undergoing this course are able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
C01	Explain the architecture, protocols and applications, of major high-speed networking technologies	K2
C02	Apply the concept learnt in this course to optimize and troubleshoot high speed network.	K3
C03	Explain the techniques involved to support real time traffic and congestion control in ATM networks	K2
CO4	Explain the concepts of integrated and differentiated services	K2
CO5	Design and configure network that have outcome characteristics needed to support a specified set of applications.	K3

Prerequisite

- Data communication and Networks
- TCP/IP Design and implementation.

Course content

UNIT I HIGH SPEED NETWORKS **9**

Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, ATM logical Connection – ATM Cell – ATM Service Categories – AAL. High Speed LAN's: Fast Ethernet – Gigabit Ethernet– Fibre Channel – Optical Networks-3G Broadband.

UNIT II CONGESTION AND TRAFFIC MANAGEMENT **8**

Queuing Analysis – Queuing Models – Single Server Queues – Effects of Congestion – Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT III TCP AND ATM CONGESTION CONTROL 12

TCP Flow control – TCP Congestion Control – Retransmission – Timer Management – Exponential RTO backoff – KARN's Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes – Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats – ABR Capacity allocations – GFR traffic management.

UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES 8

Integrated Services Architecture – Approach, Components, Services- Queuing Discipline – FQ – PS – BRFQ – GPS – WFQ – Random Early Detection – Differentiated Services.

UNIT V PROTOCOLS FOR QOS SUPPORT 8

RSVP – Goals & Characteristics, Data Flow, RSVP operations – Protocol Mechanisms – Multiprotocol Label Switching – Operations, Label Stacking – Protocol details – RTP – Protocol Architecture – Data Transfer Protocol– RTCP.

TOTAL: 45 periods

Learning Resources

Text Books:

1. William Stallings, "High speed networks and internet", Second Edition, Pearson Education, 2002.

Reference Books:

1. Warland, Pravin Varaiya, "High performance communication networks", Second Edition , Jean
Harcourt Asia Pvt. Ltd., , 2001.
2. Irvan Pepelnjk, Jim Guichard, Jeff Apcar, "MPLS and VPN architecture", Cisco Press, Volume 1 and
2, 2003.
3. Abhijit S. Pandya, Ercan Sea, "ATM Technology for Broad Band Telecommunication Networks",
CRC Press, New York, 2004.

Online Resources:

1. www.eie.polyu.edu.hk/~wai/**course**/ccn_download_01.htm
2. www.iannauniversity.com/.../cs2060-**high-speed-networks-lecture**.ht...
3. books.google.co.in/books?isbn=3540436588
4. www.yolearn.net › TNEA 2012

Course Code: UECSB37

L	T	P	C
3	0	0	3

Course Name: ROBOTICS

Prerequisite:

No prerequisite. Knowledge in controls, linear system, probability, artificial intelligence, software engineering will help to understand properly.

Course Educational Objectives:

Students undergoing this course are exposed to

- The mathematics associated with the same.
- Actuators and sensors necessary for the functioning of the robot.

Course Outcomes:

Upon the successful completion of the course, learners will be able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
C01	Discuss about scope of industrial robots and robot intelligence	K2
C02	Explain different components of robot technology (or) explain working principles of robots	K2
C03	Write a simple code using robot programming	K2
C04	Discuss Characteristics of robot level and task level language	K2
C05	Design and control robot work cell	K2
C06	Know the future trends and technologies of robots in various domain	K2

Course Content :

UNIT I SCOPE OF ROBOTS AND INTELLIGENCE 9

The scope of industrial Robots - Definition of an industrial robot - Need for industrial robots - applications. Robot Intelligence – State Space Search – Problem Reduction – Use of Predicate – logic – means Ends Analysis – Problem Solving – Robot Learning – Robot Task Planning – Basic Problems in Task Planning.

UNIT II ROBOT COMPONENTS 9

Fundamentals of Robot Technology - Automation and Robotics - Robot anatomy - Work volume - Precision of movement - End effectors - Sensors.

UNIT III ROBOT PROGRAMMING **9**

Robot Programming - Methods - interlocks textual languages. Characteristics of Robot level languages, characteristic of task level languages.

UNIT IV ROBOT WORK CELL **9**

Robot Cell Design and Control - Remote Center compliance - Safety in Robotics.

UNIT V FUTURE TRENDS **9**

Advanced robotics, Advanced robotics in Space - Specific features of space robotics systems - long-term technical developments, Advanced robotics in under – water operations. Robotics Technology of the Future - Future Applications.

TOTAL: 45 periods

Text Books:

1. Barry Leatham - Jones, "Elements of industrial Robotics" PITMAN Publishing, 1987.

Reference Books:

1. Mikell P.Groover, Mitchell Weiss, Roger N.Nagel Nicholas G.Odrey, "Industrial Robotics Technology, Programming and Applications ", McGraw Hill Book Company 1986.
2. Fu K.S. Gonzaleaz R.C. and Lee C.S.G., "Robotics Control Sensing, Visioon and Intelligence
(chapter10) " McGraw Hill International Editions, 1987.
3. Bernard Hodges and Paul Hallam, " Industrial Robotics", British Library Cataloging in Publication 1990.
4. Deb, S.R. Robotics Technology and flexible automation, Tata Mc GrawHill, 1994.

Online Resources:

1. ocw.mit.edu › ... › Mechanical Engineering › Introduction to Robotics
2. opencourses.emu.edu.tr/course/view.php?id=32
3. www.fb1.uni-bremen.de/~stugaet/wiki/images/.../Robotics1_SS09.pd...
4. www.learnerstv.com/Free-Engineering-Video-lectures-ltv071-Page1....

UECSB38 COMPONENT BASED TECHNOLOGY **L TP C**
3 0 0 3

Course Educational Objective
Students undergoing this course are expected to

- Introduces in depth JAVA, Corba and .Net Components
- Deals with Fundamental properties of components, technology and architecture and middleware.
- Component Frameworks and Development are covered in-depth.

Course Outcomes:
Students undergoing this course are able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Implement the Software components like JAVA, Corba and .Net Components	K2
CO2	Design and develop applications using JAVA Beans.	K2
CO3	Develop and demonstrate CORBA Component model.	K2
CO4	Demonstrate concepts of distributed COM.	K2
CO5	Design and develop applications using Enterprise JAVA Bean.	K2

Prerequisite

- Java Programming
- Enterprise java and web services

Course content

UNIT I **9**
Software Components – objects – fundamental properties of Component technology – modules – interfaces – callbacks – directory services – component architecture – components and middleware

UNIT II **9**
Threads – Java Beans – Events and connections – properties – introspection – JAR files – reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP

UNIT III **9**

Java and CORBA – Interface Definition language – Object Request Broker – system object model portable object adapter – CORBA services – CORBA component model – containers – application server – model driven architecture

UNIT IV **9**

COM – Distributed COM – object reuse – interfaces and versioning – dispatch interfaces – connectable objects – OLE containers and servers – Active X controls – .NET components - assemblies – appdomains – contexts – reflection – remoting

UNIT V **9**

Connectors – contexts – EJB containers – CLR contexts and channels – Black Box component framework – directory objects – cross-development environment – component-oriented programming – Component design and implementation tools – testing tools - assembly tools

TOTAL: 45 periods

Text Books:

1. Clemens Szyperski, "Component Software: Beyond Object-Oriented Programming", Pearson Education publishers, 2003
2. Gerald Brose, Andreas Vogel, Kerth Duddy ,"*Java programming with CORBA*", 3rd edition, Wiley computer publications.,2003

Reference Books:

1. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999.
2. Mowbray, "Inside CORBA", Pearson Education, 2003.
3. Freeze, "Visual Basic Development Guide for COM & COM+", BPB Publication, 2001.
4. Hortsamann, Cornell, "CORE JAVA Vol-II" Sun Press, 2002.
5. Dale Rogerson, "*INSIDE COM* ", Microsoft COM, Third edition: 2003

Online Resources:

1. www.edunotes.in/component-based-technology
2. www.estudiez.com/index.php?ctg=lesson_info&lessons_ID...
3. www.niceindia.com/qbank/it-1401_component_basedtechnology.pdf
4. www.rejinpaul.com/.../mc1631-component-based-technologies.html

Course Code: UECSB39

L	T	P	C
3	0	0	3

Course Name: SOFTWARE QUALITY ASSURANCE

Prerequisite:

- Software Engineering Principles,
- Software Testing

Course Educational Objectives:

- This course introduces concepts, metrics, and models in software quality assurance.
- The course covers components of software quality assurance systems before, during, and after software development.
- It presents a framework for software quality assurance and discuss individual components in the framework such as planning, reviews, testing, configuration management, and so on.

Course Outcomes:

Upon the successful completion of the course, learners will be able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
C01	Relate Quality Assurance Plan	K2
C02	Understand how to conduct formal inspections, record and evaluate results of inspection	K3
C03	Apply quality tools and technique in their projects	K3
C04	Establish software development with quality plan	K3
C05	Explain about standard and certification	K2

Course Content:

UNIT I FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE 9

The Role of SQA – SQA Plan – SQA considerations – SQA people – Quality Management – Software Configuration Management

UNIT II MANAGING SOFTWARE QUALITY 9

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

UNIT III SOFTWARE QUALITY ASSURANCE METRICS 9

Software Quality – Total Quality Management (TQM) – Quality Metrics – Software Quality Metrics Analysis

UNIT IV SOFTWARE QUALITY PROGRAM **9**

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

UNIT V SOFTWARE QUALITY ASSURANCE STANDARDIZATION **9**

Software Standards–ISO 9000 Quality System Standards - Capability Maturity Model and the Role of SQA in Software Development Maturity – SEI CMM Level 5 – Comparison of ISO 9000 Model with SEI's CMM

TOTAL: 45 periods

Learning Resources

Text Books

1. Mordechai Ben-Menachem / Garry S Marliss, "Software Quality", Vikas Publishing House, Pvt, Ltd., New Delhi.
2. Watts S Humphrey, " Managing the Software Process", Pearson Education Inc.

Reference Books

1. Gordon G Schulmeyer, "Handbook of Software Quality Assurance", Third Edition, Artech House Publishers 2007
2. Nina S Godbole, "Software Quality Assurance: Principles and Practice", Alpha Science International, Ltd, 2004

Online References

1. www.ou.ac.lk/science/.../277-cpu3147-software-quality-assurance
2. www.site.uottawa.ca/~awilliam/seg3203/May02.ppt
3. www.slideshare.net/.../sdpm-lecture-8-software-quality-assurance
4. ceng482.cankaya.edu.tr/.../CENG%20482_W1_publish_RLSD.pdf

UECSB40 KNOWLEDGE BASED DECISION SUPPORT SYSTEM **L T P C**
3 0 0 3

Course Educational Objective

The course has been so designed as to include.

- Development of support system
- Methods of managing knowledge
- Intelligent decision system development

Course Outcomes:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Develop decision support system.	K2
CO2	Demonstrate Decision making systems.	K3
CO3	Apply the methods of managing knowledge.	K3
CO4	Design and implement intelligent decision system.	K3
CO5	Implement Management support system	K3

Prerequisite

- Data mining and data warehousing

Course content

UNIT I **9**

Decision Making and computerized support: Management support systems. Decision making systems modeling- support.

UNIT II **9**

Decision Making Systems – Modeling and Analysis – Business Intelligence – Data Warehousing, Data Acquisition - Data Mining. Business Analysis – Visualization -Decision Support System Development.

UNIT III **9**

Collaboration, Communicate Enterprise Decision Support System & Knowledge management – Collaboration Com Technologies Enterprise information system –knowledge management.

UNIT IV **9**

Intelligent Support Systems – AI & Expert Systems – Knowledge based Systems – Knowledge Acquisition , Representation & Reasoning, Advanced intelligence system – Intelligence System over internet.

UNIT V **9**

Implementing MSS in the E-Business ERA – Electronic Commerce – integration, Impacts and the future management support systems.

TOTAL: 45 periods

Learning Resources

Text Books:

1. Decision Support Systems & Intelligent Systems – Seventh edition Efraim Turban & Jay E. Aronson
Ting-Peng Liang - Pearson/prentice Hall
2. Decision support Systems – Second Edition – George M Marakas - Pearson/prentice Hall.

Reference Books:

Decision Support Systems – V.S. Janakiraman & K. Sarukesi
2. Decision Support systems and Data warehouse Systems by Efrem G Mallach- McGraw Hill
3 . Ganesh Natarajan, Sandhya Shekhar, "Knowledge management – Enabling Business Growth", Tata
McGraw-Hill, 2002.
4. Efrem A.Mallach, "Decision Support and Data Warehouse Systems", Tata McGraw-Hill, 2002.
5. S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, Prentice Hall, 3rd Edition, 2009

Online Resources:

1. notesbygsodhi.blogspot.com/2011/04/dss.html
2. ceit.aut.ac.ir/~shiry/lecture/DSS/Introduction.ppt
3. nptel.iitm.ac.in/courses/105108081/module9/lecture39/lecture.pdf
4. oucsace.cs.ohiou.edu/~marling/iccbr03/elbalaa.pdf

UECSB41 CLOUD OMPUTING **L T P C**
3 0 0 3.

Course Educational Objective

- The main objective of cloud computing, accessing resources and services needed to perform functions with dynamically changing needs.
- To understand the cloud privacy and security concepts to create secure cloud environment.
- To learn the various cloud platforms to implement real time cloud applications.

Course Outcomes:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Discuss the genesis of Cloud computing	K2
CO2	Discuss the technology and tool kits to facilitated the Cloud computing	K2
CO3	Explain the fundamentals of cloud security	K2
CO4	Demonstrate the issues in Cloud Computing.	K2
CO5	Demonstrate how to install cloud platform and how to evaluate the performance of it.	K2

Prerequisite
Enterprise Java and Web services

Course content
UNIT I **9**
Introduction to Cloud Computing: Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds, Administering & Monitoring cloud services, benefits and limitations, Deploy application over cloud, Comparison among SAAS, PAAS, IAAS Cloud computing platforms: Infrastructure as service: Amazon EC2,Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing.

UNIT II **9**
Introduction to Cloud Technologies: Study of Hypervisors Compare SOAP and REST Webservices, AJAX and mashups-Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services Virtualization Technology: Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization Multitenant software: Multi-entity support, Multi-schema approach, Multitenance using cloud data stores, Data access control for enterprise applications.

UNIT III **9**
Cloud security fundamentals: Vulnerability assessment tool for cloud, Privacy and Security in Cloud computing security architecture: Architectural Considerations- General

Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control Identity management, Access control, Autonomic Security Cloud computing security challenges: Virtualization security management virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud.

UNIT IV **9**

Issues in cloud computing: Implementing real time application over cloud platform Issues in Intercloud environments, QOS Issues in Cloud, Dependability, data migration, streaming in Cloud. Quality of Service (QoS) monitoring in a Cloud computing environment. Cloud Middleware. Mobile Cloud Computing. Inter Cloud issues. A grid of clouds, Sky computing, load balancing, resource optimization, resource dynamic reconfiguration, Monitoring in Cloud.

UNIT V **9**

Cloud computing platforms: Installing cloud platforms and performance evaluation Features and functions of cloud platforms: Xen Cloud Platform, Eucalyptus, OpenNebula, Nimbus, TPlatform, Apache Virtual Computing Lab (VCL), Enomaly Elastic Computing Platform,

Learning Resources

Text Books:

1. George Coulouris, Jean Dollimore and Tim Kindberg, “Distributed Systems Concepts and Design”, Pearson Education, 3rd Edition, 2006.
2. Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley &Sons ,2005.
3. Gautam Shroff, Enterprise Cloud Computing- Technology, Architecture and Applications, Cambridge University Press, 2010.

Reference Books:

1. Andrew S Tanenbaum, Maartenvan Steen, “Distributed Systems, Principles and Paradigms”, Pearson Education, 2002.
2. Albert Fleishman, “Distributed Systems Software Design and Implementation”, Springer Verlag, 1994.
3. Sape Mullender, “Distributed Systems”, Addison Wesley, 2nd Edition, 1993.
4. Joshy Joseph & Craig Fellenstein, “Grid Computing”, Pearson Education 2004.
5. Barrie Sosinsky, Cloud Computing Bible, John Wiley & Sons, 2011.

Online Resources:

1. www.rackspace.com/cloud
2. www.cloudcomputingexpo.com
3. www.ibm.com/cloud-computing/us/en

UEBAB04 PROFESSIONAL ETHICS AND HUMAN VALUES **L T P C**
3 0 0 3

. . Course Educational Objective

Students undergoing this course are expected to

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

Course Outcomes:

Students undergoing this course are able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Understand the human values	K2
CO2	Explain about the sense of Engineering Ethics	K2
CO3	Apply engineering in social experimentation	K2
CO4	Explain Safety, Responsibilities And Rights	K2
CO5	Discuss about global issues	K2

Prerequisite

- Higher secondary level

Course content

UNIT I HUMAN VALUES **9**

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

UNIT II ETHICS **9**

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

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION **9**

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

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

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

UNIT V GLOBAL ISSUES **9**

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

TOTAL: 45 periods

Learning Resources

Text Books:

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

Reference Books:

1. Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint now available).
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Leatning, United States, 2000 (Indian Reprint now available)
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.

Online Resources:

1. www.faadooengineers.com › ... › Other Engineering Ebooks
2. craftkeys.com/professional/professional-ethics-and-human-values-lec...
3. www.linxdown.me/.../professional+ethics+and+human+values+lectur...

UECSB42 DATA BASE TECHNOLOGIES **L T P C**
3 0 0 3

Course Educational Objective

- To understand the concepts of Oracle architecture components
- To get overview of Storage Structure and Relationships

Course Outcomes:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the concepts of Oracle architecture components.	K2
CO2	Use data files and log files	K3
CO3	Explain the overview of Storage Structure and Relationships	K3
CO4	Illustrate the concepts of Managing Process	K3
CO5	Demonstrate the Roles of Managers.	K2

Prerequisite

- Database Management systems

Course content

UNIT I **9**

Oracle Architectural Components – Getting Started with the Oracle Server – Managing an Oracle instance – Creating a Database.

UNIT II **9**

Using Data Dictionary and Dynamic Performance Views – Maintaining the Control File – Maintaining Online Redo Log Files – Managing Tablespaces and Data Files.

UNIT III **9**

Storage Structure and Relationships – Managing Undo Data – Managing Tables – Managing Indexes.

UNIT IV **9**

Maintaining Data Integrity – Managing Password Security and Resources – Managing Users – Managing Privileges.

UNIT V **9**

Managing Roles – Auditing – Loading Data into a Database – Using Globalization Support.

TOTAL: 45 periods

Learning Resources

Reference Books:

1. Oracle9i Database Administration Fundamentals I, Volume I, Author Marie St. Gelais, Publisher Shane Mattimoe. 2009

2. Oracle9i Database Administration Fundamentals I, Volume II, Author Marie St. Gelais, Publisher Shane Mattimoe. 2009

Online Resources:

1. wwwdb.inf.tu-dresden.de › Lectures
2. web.eecs.umich.edu/~teorey/lec.notes.pdf
3. ocw.mit.edu/courses/civil...database...technologies.../lecture-notes
4. https://www.cs.duke.edu/courses/fall04/cps116/LectureNotes.html

UECSB43 DISTRIBUTED COMPUTING **L T PC**
3 00 3

Course Educational Objectives:

Students undergoing this course are exposed to

- Form a significant field of computer science and an active area of research distributed systems.
- A clear understanding of the concepts that underlie distributed computing systems along with design and implementation issues.
- Key mechanisms and models for distributed systems will be considered.

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Gain a clear understanding of the concepts that underlie Hardware and software infrastructure systems along with design and implementation issues.	K2
CO2	Demonstrate understanding of theoretical foundations of programming concurrent computing systems	K1
CO3	Understand key mechanisms and models for distributed systems including logical clocks, causality, vector timestamps, consistent global states, election algorithms, distributed mutual exclusion, consistency, replication, fault tolerance, distributed deadlocks, recovery, agreement protocols	K1
CO4	Explain the common concepts of distributed database.	K2
CO5	Implement the applications of Object-oriented Databases.	K3

Pre-requisite:

- Data communication and networks.
- Operating systems
- Database Management systems

Course Content

UNIT I THE HARDWARE INFRASTRUCTURE **9**

Broad Band Transmission Facilities - Open Interconnection Standards - Local Area Networks - Wide Area Networks - Network Management - Network Security - Cluster Computers.

UNIT II SOFTWARE ARCHITECTURES **9**

Client - Server Architectures - Challenges - Design Methodology - Intranets and Groupware - Hardware and Software for Intranet - Groupware and Features - Network as a Computer - The Internet - IP Addressing - Internet Security - Open Systems - Concepts and Reality.

UNIT III OPERATING SYSTEM ISSUES 9

Distributed Operating Systems - Transparency - Inter-Process Communication - Client - Server Model – Remote Procedure Call - Group Communications - Threads - System Models - Process Synchronisation - Deadlocks - Solutions - Load Balancing - Distributed File Systems - Distributed Shared Memory Systems - Micro-Kernels.

UNIT IV FUNDAMENTAL DISTRIBUTED COMPUTING ASPECTS 9

Theoretical Foundations - Logical Clocks - Vector Clocks - Global State - Termination - Correctness – Election Algorithms - Termination Detection - Fault Tolerance - Missing Token - Consensus Algorithms - Byzantine - Consensus - Interactive Consistency.

UNIT V MANAGING DISTRIBUTED DATA 9

Distributed Databases - Distribution Transparency - Distributed Database Design - Query Translation – Query Optimisation - Concurrency Control - Object-Oriented Databases - Strategic Considerations - Applications of Object-oriented Databases.

TOTAL:45 Periods

Learning Resources:

Text Books

1. Sape Mullender, Distributed Systems, Addison-Wesley, 1993.
2. Albert Fleishman, Distributed Systems - Software Design & Implementation, Springer-Verlag, 1994.

Reference Books

1. Mukesh Singal and Shivaratu N.G., Advanced Concepts in Operating Systems, McGraw Hill, Newyork,1994.
2. George Coulouris and Jean Dollimore, Distributed Systems - Concepts and Design, Addison-Wesley, 1988.
3. Gerard Tel, Introduction to Distributed Algorithms, Cambridge University Press, 1994.

Online Resources

1. mucompssem8.blogspot.com/2012/03/distributed-computing-notes.htm
2. cs-www.cs.yale.edu/homes/aspnes/classes/465/notes.pdf
3. dcg.ethz.ch/lectures/podc_allstars/
4. web.eecs.umich.edu/~farnam/498/handout1c.pdf
5. www.cs.princeton.edu/courses/archive/spr01/cs461/lectures.html

UECSB44 INFORMATION AND CODING THEORY **L T P C**
3 0 0 3

Course Educational Objectives:

Students undergoing this course are exposed to

- Understand the difference between "data" and "information" in a message.
- Learn how to analyze and measure the information per symbol emitted from a source.
- Learn how to analyze the information-carrying capacity of the communication channel.
- Learn how to design source compression codes to improve the efficiency of information transmission.
- Learn how to adapt and tailor known error control codes for use in particular applications.
- Learn the basic theory needed for data encryptions.

Course Outcomes

Upon the successful completion of the course, learners will be able to

CO Nos.	**Course Outcomes**	**Level of learning domain (Based on revised Bloom's taxonomy)**
CO1	Understand the mathematical theory of linear channel codes for error detection and correction	K1
CO2	Evaluate the information rate of various information sources.	K2
CO3	Implement cyclic block codes using feedback shift register logic circuits.	K2
CO4	Explain and analyse source coding, compression and error control methods.	K2
CO5	demonstrate and design simple convolutional codes.	K3

Pre-requisite: Digital principles and system design

Course Content

UNIT I INFORMATION THEORY **9**

Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Joint and conditional entropies, Mutual information - Discrete memory less channels – BSC, BEC – Channel capacity, Shannon limit.

UNIT II SOURCE CODING: TEXT, AUDIO AND SPEECH **9**

Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

UNIT III SOURCE CODING: IMAGE AND VIDEO **9**

Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard

UNIT IV ERROR CONTROL CODING: BLOCK CODES **9**

Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder – CRC

UNIT V ERROR CONTROL CODING: CONVOLUTIONAL CODES **9**

Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

TOTAL= 45 PERIODS

Learning Resources
Text Books:

1. R Bose, “Information Theory, Coding and Crptography”, TMH 2007
2. Fred Halsall, “Multidedia Communications: Applications, Networks, Protocols and Standards”, Perason Education Asia, 2002

Reference Books

1. K Sayood, “Introduction to Data Compression” 3/e, Elsevier 2006
2. S Gravano, “Introduction to Error Control Codes”, Oxford University Press 2007
3. Amitabha Bhattacharya, “Digital Communication”, TMH 2006

Web References

1. www.haverford.edu/cmsc/slindell/Classes/235/235.htm
2. www.cl.cam.ac.uk/teaching/.../InfoTheory/InfoTheoryLectures.pdf
3. www.mth.msu.edu/~jhall/classes/codenotes/coding-notes.html
4. u.cs.biu.ac.il/~lindell/89-662/coding_theory-lecture-notes.pdf

UECSB45 PARALLEL COMPUTING **L T P C**
3 0 0 3

Course Educational Objective

Students undergoing this course are expected to

- To study the scalability and clustering issues and the technology necessary for them.
- To understand the technologies enabling parallel computing.
- To study the different types of interconnection networks.
- To study the different parallel programming models.
- To study the software support needed for shared memory programming.

Course Outcomes:

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the different types of interconnection networks	K2
CO2	Demonstrate the concepts Parallel Algorithms	K3
CO3	Demonstrate the concepts of Shared memory Based parallel Computers	K3
CO4	Illustrate and Simulate Shared memory on networks.	K3
CO5	Demonstrate different parallel programming models	K3

Prerequisite

- Computer Networks
- Algorithms
- Distributed Computing

Course content

UNIT I **9**

Fundamental Theoretical issues in designing parallel algorithms and architecture-parallel computers based on interconnection networks such as Hyper cubes-Shuffle-Exchanges-Trees-Meshes

UNIT II **9**

Butterfly networks-parallel Algorithm for arithmetic- Linear Algerbra-fourier Transforms-recurrence Evaluations and defence graph problem- Use of Graph embedded techniques to compare different Networks

UNIT III **9**

Shared memory Based parallel Computers-algorithms for list ranking-maximal independent set

UNIT IV **9**

Arithmetic Expression Evaluation-convex hull problems and others-message routing – simulation of shared memory on networks

UNIT V **9**

Thompson grid Model for VLSI layouts for standard interconnection networks-Area universal networks.

TOTAL: 45 periods

Text Books:

1.Kai Hwang and Zhi.Wei Up," Scalable Parallel Computing ",Tata McGrawHill,New Delhi 2003

2.David E.Culler & Jaswinder Pal Singh," Parallel Computing Architecture"

Reference Books:

1.Michael J.Quinn,"Parallel Programming in C with MPI & Open MP", Tata McGrawHill,New Delhi 2003

2.Kai Hwang,"Advanced Computer Architecture", Tata McGrawHill,New Delhi 2003

3.Parallel Programming: Techniques and Applications Using Networked Workstations and ParallelComputers, 2nd Edition, Prentice Hall

4.Parallel Computing on Heterogeneous Networks, by Alexey Lastovetsky, Wiley, 2003, ISBN: 0-471-22982-2

5.The Sourcebook of Parallel Computing, by Jack Dongarra, Ian Foster, Geoffrey Fox, Ken Kennedy, Andy White, Linda Torczon, and William Gropp, Morgan Kaufmann, ISBN: 1-55860-871-0

Online References

1. www.clear.rice.edu/comp422/lecture-notes/index.html
2. cs.nju.edu.cn/~gchen/teaching/fpc/fpc99.html
3. brahms.emu.edu.tr/rza/chapter1.pdf
4. grid.hust.edu.cn/ppcourse/lecture.html

UEBAB01 TOTAL QUALITY MANAGEMENT **L T P C**
3 0 0 3

Pre-requisite: None

Course Educational Objectives:

Students undergoing this course are exposed to

- understand the philosophy and core values of Total Quality Management (TQM);
- Determine the voice of the customer and the impact of quality on economic performance and long-term business success of an organization;
- Apply and evaluate best practices for the attainment of total quality.

Course Outcomes:

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Develop an understanding on quality management philosophies and frameworks	K2
CO2	Develop in-depth knowledge on various tools and techniques of quality management	K1
CO3	Learn the applications of quality tools and techniques in both manufacturing and service industry	K1
CO4	understand proven methodologies to enhance management processes, such as benchmarking and business process reengineering;	K2
CO5	Choose a framework to evaluate the performance excellence of an organization, and determine the set of performance indicators that will align people with the objectives of the organization.	K3

Course Content

UNIT I INTRODUCTION TO QUALITY MANAGEMENT **9**

Definitions – TOM framework, benefits, awareness and obstacles. Quality – vision, mission and policy statements. Customer Focus – customer perception of quality, Translating needs into requirements, customer retention. Dimensions of product and service quality. Cost of quality.

UNIT II PRINCIPLES AND PHILOSOPHIES OF QUALITY MANAGEMENT **9**

Overview of the contributions of Deming, Juran Crosby, Masaaki Imai, Feigenbaum, Ishikawa, Taguchi, Shingeo and Walter Shewhart. Concepts of Quality circle, Japanese 5S principles and 8D methodology.

UNIT III STATISTICAL PROCESS CONTROL AND PROCESS CAPABILITY 9

Meaning and significance of statistical process control (SPC) – construction of control charts for variables and attributed. Process capability – meaning, significance and

measurement – Six sigma concepts of process capability. Reliability concepts – definitions, reliability in series and parallel, and product life characteristics curve. Total productive maintenance (TMP) – relevance to TQM, Terotecchnology.Business process re-engineering (BPR) – principles, applications, reengineering process, benefits and limitations.

UNIT IV TOOLS AND TECHNIQUES FOR QUALITY MANAGEMENT 9

Quality functions development (QFD) – Benefits, Voice of customer, information organization, House of quality (HOQ), building a HOQ, QFD process.

Failure mode effect analysis (FMEA) – requirements of reliability, failure rate, FMEA stages, design, process and documentation. Taguchi techniques – introduction, loss function, parameter and tolerance design, signal to noise ratio. Seven old (statistical) tools. Seven new management tools. Bench marking and POKA YOKE.

UNIT V QUALITY SYSTEMS ORGANIZING AND IMPLEMENTATION 9

Introduction to IS/ISO 9004:2000 – quality management systems – guidelines for performance improvements. Quality Audits.TQM culture, Leadership – quality council, employee involvement, motivation, empowerment, recognition and reward.Information technology – computers and quality functions, internet and electronic communications. Information quality issues.

TOTAL: 45 periods

Text Books

1. Dale H.Besterfield et al, Total Quality Management, Third edition, Perarson Education (First Indian Reprints 2004)

2. Shridhara Bhat K, Total Quality Management – Text and Cases, First Edition 2002, Himalaya Publishing House.

Reference Books

1. William J.Kolarii, Creating quality, McGraw Hill, 1995

2. Poornima M.Charantimath., Total quality management, Pearson Education, First Indian Reprint 2003.

3. Rose J.E. Total Quality Management, Kogan Page India Pvt Ltd, 1993.

4. Indian standard – quality management systems – Guidelines for performance improvement (Fifth Revision), Bureau of Indian standards, New Delhi.

Web References

1. homepages.stmartin.edu/fac_staff/dstout/.../lecture_notes.htm
2. www.tricity.wsu.edu/Su_DecS340/LectureNotes/5TQM.doc
3. https://www.msu.edu/course/fsm/325/l_tqm.pdf

UECSB46 UNIX INTERNALS **L T P C**
3 0 0 3

Course Educational Objectives :

Student undergoing this course are exposed to

- Get thorough understanding of the kernel.
- Understand the file organization and management.
- Enhance knowledge about various system calls.
- Have knowledge of process architecture, process control & scheduling and memory management.

Course Outcomes :

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain the basic concepts of UNIX Operating System	K2
CO2	Explain the operational concepts of Buffer,INode	K2
CO3	Discuss the various operations of File concepts	K2
CO4	Describe the various aspects of Process Control.	K2
CO5	Apply various Scheduling techniques for a given situations.	K3
CO6	Describe the various operations of I/O subsystems	K2

Prerequisite :

- Operating system
- Operating system Lab

Course Content

UNIT I **9**

History – System structure – User perspective – Operating system services – Assumptions about hardware. Introduction to the Kernel : Architecture of the UNIX operating system – Introduction to system concepts – Kernel data structures – System administration – Summary and Preview.

UNIT II **9**

Buffer headers – Structure of the buffer pool – Advantages and disadvantages of the buffer cache. Internal representation of files : Inodes – Structure of a regular file – Directories – Conversion of a path name to an Inode – Super block – Other file types.

UNIT III **9**

Open – Read – Write – File and record locking – Adjusting the position of file I/O – LSEEK – Close – File creation – Creation of special files – Pipes – Dup – Mounting and unmounting file systems

UNIT IV **9**

Process states and transitions – Layout of system memory – The context of a process –

Saving the context of a process. Process Control: Process creation – Signals – Process termination – Awaiting process termination – Invoking other programs – The shell – System boot and the INIT process.

UNIT V **9**

Process Scheduling – Memory Management Policies : Swapping – A hybrid system with swapping and demand paging. The I/O Subsystem : Driver Interfaces– Disk Drivers- Terminal Drivers.

TOTAL: 45 Periods

Learning resources

Text Book

1. Maurice J. Bach, "The Design of the Unix Operating System", Prentice Hall of India,2004.

Reference Books

1. Vahalia, "Unix Internals: The New Frontiers", Pearson Education Inc, 2003.
2. S. J. Leffler, M. K. Mckusick, M. J. .Karels and J. S. Quarterman., "The Design And Implementation of the 4.3 BSD Unix Operating System", Addison Wesley, 1998.
3. Uresh Vahalia, "Unix Internals: The New Frontiers", Pearson Education, 1996.
4. Steve D Pate, "UNIX File systems: Evolution, Design and Implementation", Wiley Publishing Inc., 2003

Online resources

1. dl.acm.org/citation.cfm?id=225502
2. www.cnet.com/products/unix-internals-the-new-frontiers-reference-boo
3. https://www.cs.nyu.edu/courses/fall00/G22.2245-001/lect13.ppt
4. nuovacei.it/unix-internals-pdf-54619-free-COb43?page_id=51
5. csestudies.weebly.com
6. www.cs.ucsb.edu/~rich/class/cs170/notes/FileSystem/rich.fs.html

UECSB47 TCP/IP DESIGN AND IMPLEMENTATION **L T P C**
3 0 0 3

Course Educational objectives

Students undergoing this course are exposed to

- To understand the internals of the TCP/IP protocols
- To understand how TCP/IP is actually implemented
- To understand the interaction among the protocols.

Course Outcomes:

Upon the successful completion of the course, learners will be able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Explain the concept of Internet services, Internetworking concepts and architecture model	K2
CO2	Identify different types internet addressing and explain protocols involved in addressing technique	K2
CO3	Describe various functions of UDP protocol.	K2
CO4	Discuss about routing architecture for different network structure.	K2
CO5	Explain implementation of TCP for various networking models.	K2

Prerequisite:

- Basics of Computers and C Programming
- Computer Networks

Course Content

UNIT I INTRODUCTION **9**

The TCP /IP Internet, Internet Services, Ethernet Technologies, Asynchronous Transfer mode, Internetworking concepts and architecture model : Inter Connection and properties, Internet Architecture, Interconnection Through IP Routers

UNIT II INTERNET ADDRESSES AND PROTOCOLS **9**

Classful Internet Address: Introduction, Universal Identifiers, Scheme, Address specify Network Connections, Broadcast, IP Multicast Address, Weakness. ARP, RARP, IP Connectionless Datagram Delivery, Forwarding IP Datagram's, Error and Control Messages.

UNIT III UDP AND TCP **9**

UDP: Message Format, Header, Encapsulation and Protocol Layering, Checksum Computation, Multiplexing, De-multiplexing. Reliable Stream Transport Service (TCP).

UNIT IV ROUTING **9**

Routing Architectures: Cores, Peers, Algorithms, Exterior Gateway Protocol, Border Gateway Protocol , Routing Information Protocol, Interior Gateway Protocol: Open SPF Protocol.

UNIT V TCP IMPLEMENTATION **9**

Internet Multicasting, IP Switching, Multi Protocol Label Switching, Mobile IP, Client-Server Model of interactions, The Socket Interface, Bootstrap and Auto configuration.

TOTAL: 45 periods

Learning Resources

Text Book

1. Douglas E Comer," Internetworking with TCP/IP Principles, Protocols and Architecture", PHI, Volume 1, Fifth Edition, 2006.
2. W.Richard Stevans "TCP/IP Illustrated" Vol 1.2003.

Reference Book

1. Behrouz A. Forouzan, " TCP/IP Protocol Suite" Fourth Edition, Tate MC Graw Hill, 2010.
2. W.Richard Stevens "TCP/IP Illustrated" Volume 2, Pearson Education 2003

Web Resource

1. www.einsteincollege.ac.in/cse_lecture_notes.html
2. www.cs.virginia.edu/~cs458/slides.html
3. craftkeys.com/tcp/tcp-ip-design-and-implementation-lecture-notes/

UECSB48 SOFT COMPUTING **L T P C**
3 0 0 3

Course Educational Objectives:

Students undergoing this course are exposed to

- learn an overall knowledge of soft computing theories and fundamentals
- understanding on the fundamentals of non-traditional technologies and approaches to solving hard real-world problems
- Fundamentals of artificial neural networks, fuzzy sets and fuzzy logic and genetic algorithms.

Course Outcomes:

Upon the successful completion of the course, learner will be able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Discuss briefly about introduction of neural network and its architecture.	K2
CO2	Explain back propagation method with example.	K2
CO3	Discuss briefly about introduction of fuzzy logic.	K2
CO4	Explain fuzzy membership and its rules.	K2
CO5	Explain genetic algorithm with its applications	K3

Prerequisite:

Nil

Course content

UNIT-I NEURAL NETWORKS-1(INTRODUCTION & ARCHITECTURE) 9

Neuron, Nerve structure and synapse, Artificial Neuron and its model, activation functions, Neural network architecture: single layer and multilayer feed forward networks, recurrent networks.Various learning techniques; perception and convergence rule,
Auto-associative and hetro-associative memory.

UNIT-II NEURAL NETWORKS-II (BACK PROPOGATION NETWORKS) 9

Architecture: perceptron model, solution, single layer artificial neural network, multilayer perception model; back propogation learning methods, effect of learning rule co-efficient ;back propagation algorithm, factors affecting backpropagation training, applications.

UNIT-III FUZZY LOGIC-I (INTRODUCTION) 9

Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion.

UNIT-IV FUZZY LOGIC –II (FUZZY MEMBERSHIP, RULES) 9

Membership functions, interference in fuzzy logic, fuzzy if-then rules, Fuzzy implications and Fuzzy algorithms, Fuzzyfications & Defuzzificataions, Fuzzy Controller, Industrial applications.

UNIT-V GENETIC ALGORITHM(GA) 9

Basic concepts, working principle, procedures of GA, flow chart of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications.

TOTAL: 45 periods

Learning Resources

Text Books:

1. S. Rajsekaran & G.A. Vijayalakshmi Pai, "Neural Networks,Fuzzy Logic and Genetic Algorithm:Synthesis and Applications" Prentice Hall of India.
2. N.P.Padhy,"Artificial Intelligence and Intelligent Systems" Oxford University Press,2005

Reference Books:

1. Siman Haykin,"Neural Netowrks"Prentice Hall of India
2. Timothy J. Ross, "Fuzzy Logic with Engineering Applications" Wiley India,2009
3. Kumar Satish, "Neural Networks" Tata Mc Graw Hill,2004

UECSB49 WEB TECHNOLOGY **L T P C**
3 0 0 3

Course Educational Objectives:

Students undergoing this course are exposed to

- Get introduction about various Scripting Languages.
- Familiar with an up-to-date survey of developments in. Web Technologies.
- To know techniques involved to support real-time Software development.

Course Outcomes:

Upon the successful completion of the course, learners will be able to

CO Nos	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Design a basic web site using HTML, XML, XHTML.	K3
CO2	Use client side technology to design web site.	K3
CO3	Use server-side technologies (Servlets and JSP) to design websites.	K3
CO4	Recognize and evaluate website organizational structure and design elements.	K3
CO5	Develop simple back-end database using web service	K3

Prerequisite:

- JAVA Programming,
- J2SE Lab

Course Content

UNIT I 9

Web Essentials: Clients, Servers, and Communication. The Internet-Basic Internet Protocols -The World Wide Web-HTTP request message-response message-Web Clients Web Servers-Case Study. Markup Languages: XHTML. An Introduction to HTMLHistory-Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTMLElements-Relative URLs-Lists-tables-Frames-Forms-XML Creating HTML Documents Case Study.

UNIT II 9

Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML Style Rle Cascading and Inheritance-Text Properties-Box Model Normal Flow Box Layout-Beyond the Normal Flow-Other Properties-Case Study. Client-Side Programming: The JavaScript Language-History and Versions Introduction JavaScript in Perspective-Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

UNIT III 9

Host Objects : Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window-Case Study. Server-Side Programming: Java Servlets- Architecture -Overview-A Servelet-Generating Dynamic Content-Life Cycle-Parameter Data-Sessions-Cookies-URL Rewriting-Other Capabilities-Data Storage Servelets and Concurrency-Case Study-Related Technologies.

UNIT IV 9

Representing Web Data: XML-Documents and Vocabularies-Versions and Declaration - Namespaces JavaScript and XML: Ajax-DOM based XML processing Event-oriented Parsing: SAX-Transforming XML Documents-Selecting XML Data: PATH-Template-based Transformations: XSLT-Displaying XML Documents in Browsers-Case Study-Related Technologies. Separating Programming and Presentation: JSP Technology Introduction-JSP and Servlets-Running JSP Applications Basic JSP-JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm-CaseStudy-Related Technologies.

UNIT V 9

Web Services: JAX-RPC-Concepts-Writing a Java Web Service-Writing a Java Web Service Client-Describing Web Services: WSDL- Representing Data Types: XMLSchema-Communicating Object Data: SOAP Related Technologies-Software Installation-Storing Java Objects as Files-Databases and Java Servlets.

TOTAL = 45 PERIODS

Learning Resources

Text Book:

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", PearsonEducation, 2006.

Reference:

1. Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition, PearsonEducation, 2007

.2. Deitel, Deitel, Goldberg, "Internet & World Wide Web How To Program", ThirdEdition, Pearson Education, 2006.

3. Marty Hall and Larry Brown,"Core Web Programming" Second Edition, Volume Iand II, Pearson Education, 2001.4. Bates, "Developing Web Applications", Wiley, 2006

Oline Resource:

1. lecturenotes.in/notes/engg/paper/iwt/index.html
2. http://lecture-notes-forstudents.blogspot.in/p/web-technology-lecture-notes-and.html
3. http://www.4shared.com/file/120547364/ea506122/Web_TechnologiesModule1.html
4. www.edunotes.in/web-technology-1
5. https://computerscienceebooks.wordpress.com

UECSB50 MULTIMEDIA SYSTEMS **L T P C**
3 0 0 3

Course Educational Objectives

To study the multimedia concepts and various I/O technologies.
To enable the students to develop their creativity

Course Outcome

Upon the successful completion of the course, learners will be able to

COURSE NO.S	COURSE OUTCOME	LEVELS OF LEARNING DOMAINS
CO1	To learn the basic concepts of multimedia and animation techniques	K2
CO2	To analyze the basic tools required for multimedia	K2
CO3	To learn how to manage the resources in multimedia	K2
CO4	To define the notion of multimedia communication systems	K2
CO5	To apply the different types of services in multimedia application.	K3

Pre Requisite

- Data structures
- Java programming

Course Content

UNIT I **9**

INTRODUCTION: Elements of multimedia system – Need and aspects of multimedia - Information units.
MULTIMEDIA:Sound - Audio file formats – MIDI – Images - Computer Image Processing - Principles of animation - Animation techniques - Creating animated scenes – Video - Basic concepts - Video Capture - Recording format - Storage for multimedia - CD Technologies - Multimedia Workstations

UNIT II **9**

MULTIMEDIA TOOLS: Basic tools - Image-editing tool - Painting and drawing tools – Sound editing programs - Video formats - Linking multimedia objects – OLE -presentation tools - authoring tools. DATA COMPRESSION: Source entropy and hybrid coding – JPEG – MPEG - H.261 - DVI

UNIT III **9**

MULTIMEDIA OPERATING SYSTEMS: Introduction - Real Time - Resource Management - Process Management - File Systems - Database Systems - Multimedia

Database Management System - Characteristics of an MDBMS - Data Analysis - Data Structure - Operations on Data - Integration in a Database Model

UNIT IV **9**

MULTIMEDIA COMMUNICATION SYSTEMS: Application Subsystem - Transport Subsystem – Synchronization -Introduction - Notion of Synchronization - Presentation Requirements - A Reference Model for Multimedia Synchronization - Synchronization in distributed environment

UNIT V **9**

MULTIMEDIA APPLICATIONS: Video conferencing - Tele conferencing – Tele services – messaging services – retrieval services – Tele action services

TOTAL: 45 Periods

Text Book

1. Ralf Steinmetz, Klara Nahrstedt, "Multimedia: Computing, Communications and Applications", Pearson Education Asia, New Delhi, 2002.

Reference Books

1. Tay Vaughan, “Multimedia: Making it work”, sixth edition, Tata McGraw Hill, New Delhi, 2002.
2. Fred Halsall, “Multimedia Communication, Application Networks, Protocols and Standard”, fourth edition, Addison Wesley, New Delhi, 2001.
3. John F.Koegal Buford, “Multimedia Systems”, Pearson Educational Asia, New Delhi, 2001.
4. Ron, Goldberg, "Multimedia Producer's Bible", fifth edition, Comdex Computer Publishing, New Delhi, 1996.

Online resources

1. surendar.chandrabrown.org/teach/spr09/cse40373/**lecture**.html
2. discovery.bits-pilani.ac.in/~vimalsp/267MMC/**Lectures**/**Lecture**-1.ppt
3. www.cs.bc.edu/~hjiang/c335/**notes**/index.html

UECSB51 ENTERPRISE RESOURCE PLANNING **L T P C**
3 0 0 3

Course Educational Objectives

Students undergoing this course are expected to

- To know the basics of ERP
- To understand the key implementation issues of ERP
- To know the business modules of ERP
- To be aware of some popular products in the area of ERP
- To appreciate the current and future trends in ERP

Course Outcomes

Upon the successful completion of the course, learners will be able to

COURSE NO.S	COURSE OUTCOME	LEVELS OF LEARNING DOMAINS
CO1	To learn business process and product life cycle management	K2
CO2	To define the pre implementation task and its challenges	K2
CO3	To analyze the business modules and different management techniques	K2
CO4	To evaluate the how to perform the ERP market	K2
CO5	To analyze the E- business and future directions towards ERP	K3

Pre-Requisite

- Total quality management

Course Content

UNIT I ERP AND TECHNOLOGY **10**

Introduction – Related Technologies – Business Intelligence – E-Commerce and E-Business – Business Process Reengineering – Data Warehousing – Data Mining – OLAP – Product life Cycle management – SCM – CRM

UNIT II ERP IMPLEMENTATION **10**

Implementation Challenges – Strategies – Life Cycle – Pre-implementation Tasks – Requirements Definition – Methodologies – Package selection – Project Teams – Process Definitions – Vendors and Consultants – Data Migration – Project management – Post Implementation Activities.

UNIT III ERP IN ACTION & BUSINESS MODULES **8**

Operation and Maintenance – Performance – Maximizing the ERP System – Business Modules – Finance – Manufacturing – Human Resources – Plant maintenance – Materials Management – Quality management – Marketing – Sales, Distribution and service.

UNIT IV ERP MARKET **9**

Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software – Epicor – Intutive

UNIT V ERP – PRESENT AND FUTURE 8

Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP.

TOTAL = 45 PERIODS

Learning Resourses'

Text Book

1. Alexis Leon, "ERP DEMYSTIFIED", Tata McGraw Hill, Second Edition, 2008.2. Mary Sumner, "Enterprise Resource Planning", Pearson Education, 2007.

Reference Book

1. J im Mazzullo,"SAP R/3 for Everyone", Pearson,2007.2. Jose Antonio Fernandz, " The SAP R /3 Handbook", Tata McGraw Hill, 1998.3. Biao Fu, "SAP BW: A Step-by-Step Guide", First Edition, Pearson Education, 2003

Online Resourses

1. www.me.iitb.ac.in/~subash/erp.pdf
2. www.slideshare.net/Agcristi/lecture-note-3815679
3. www.iimahd.ernet.in/.../2090305444ERP%20Systems%20TPE.pdf

UECSB52 SERVICE ORIENTED ARCHITECTURE **L T P C**
3 0 0 3

Course Educational Objective
Students undergoing this course are expected

- To gain understanding of the basic principles of service orientation
- To learn service oriented analysis techniques
- To learn technology underlying the service design
- To learn advanced concepts such as service composition, orchestration and Choreography

Course Outcomes
Upon the successful completion of the course, learners will be able to

COURSE NO.S	COURSE OUTCOME	LEVELS OF LEARNING DOMAINS
CO1	Know about the basic principles of service oriented architecture , its components and techniques	K2
CO2	Explain the architecture of web services	K2
CO3	Design and explain web services using protocol	K2
CO4	Explain technology underlying the service design	K2
CO5	Acquire the fundamental knowledge of cloud computing	K2

Pre-requisite

- **Nil**

Course Content
UNIT I **9**

Roots of SOA – Characteristics of SOA - Comparing SOA to client-server and distributed internet architectures – Anatomy of SOA- How components in an SOA interrelate -Principles of service orientation

UNIT II **9**

Web services – Service descriptions – Messaging with SOAP –Message exchange Patterns – Coordination –Atomic Transactions – Business activities – Orchestration – Choreography - Service layer abstraction – Application Service Layer – Business Service Layer – Orchestration Service Layer

UNIT III **9**

Service oriented analysis – Business-centric SOA – Deriving business services-service modeling - Service Oriented Design – WSDL basics – SOAP basics – SOA composition guidelines – Entity-centric business service design – Application service design – Task-centric business service design

UNIT IV **9**

SOA platform basics – SOA support in J2EE – Java API for XML-based web services(JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries(JAXR) - Java API for XML based RPC (JAX-RPC)- Web Services Interoperability Technologies (WSIT) - SOA support in .NET – Common Language Runtime - ASP.NET web forms – ASP.NET web services – Web Services Enhancements (WSE)

UNIT V **9**

WS-BPEL basics – WS-Coordination overview - WS-Choreography, WS-Policy, WS-Security

TOTAL = 45 PERIODS

Text Books

1. Thomas Erl, ‘‘Service-Oriented Architecture: Concepts, Technology, and Design’’,Pearson Education, 2005.

Reference Books:

1. Thomas Erl, “SOA Principles of Service Design “(The Prentice Hall Service- Oriented Computing Series from Thomas Erl), 2005
.2. Newcomer, Lomow, “Understanding SOA with Web Services”, Pearson Education,2005.
3. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services, AnArchitect’s Guide”, Pearson Education, 2005.
4. Dan Woods and Thomas Mattern, “Enterprise SOA Designing IT for Business Innovation” O’REILLY, First Edition, 2006

Web References

1. http://www.slideshare.net/Agcristi/lecture-note-3815679
2. http://www.iimahd.ernet.in/assets/upload/mdp/2090305444ERP%20Systems%20TPE.pdf

UECSB53 ADVANCED JAVA PROGRAMMING **L T P C**
3 0 0 3

Course Educational Objectives

Students undergoing this course are expected to

To learn advanced Java programming concepts like interface, threads,Swings etc.
To develop network programs in Java
To understand Concepts needed for distributed and multi-tier applications
To understand issues in enterprise applications development.

Course Outcome

Upon the successful completion of the course, learners will be able to

COURSE NO.S	COURSE OUTCOME	LEVELS OF LEARNING DOMAINS
CO1	To understand the concept of I/O streaming and threads	K2
CO2	To analyze Advanced Java Networking concepts	K2
CO3	To know about IDl technology and Custom sockets	K2
CO4	To learn Server Side Programming Concepts and JDBC Principles	K2
CO5	To develop Media Applications, 3D Graphics and to work with Swings	K3
CO6	To learn J2EE,Session Beans and Entity Beans	K2

Pre-Requisite

- Object oriented programming
- Enterprise java and web services

Course Content

UNIT I JAVA FUNDAMENTALS **9**

Java I/O streaming – filter and pipe streams – Byte Code interpretation - Threading – Swing.

UNIT II NETWORK PROGRAMMING IN JAVA **9**

Sockets – secure sockets – custom sockets – UDP datagrams – multicast sockets – URL classes – Reading Data from the server – writing data – configuring the connection – Reading the header – telnet application – Java Messaging services

UNIT III APPLICATIONS IN DISTRIBUTED ENVIRONMENT **9**

Remote method Invocation – activation models – RMI custom sockets – Object Serialization – RMI – IIOP implementation – CORBA – IDL technology – Naming Services – CORBA programming Models - JAR file creation

UNIT IV MULTI-TIER APPLICATION DEVELOPMENT **9**

Server side programming – servlets – Java Server Pages - Applet to Applet communication – applet to Servlet communication - JDBC – Applications on databases – Multimedia streaming applications – Java Media Framework.

UNIT V ENTERPRISE APPLICATIONS **9**

Server Side Component Architecture – Introduction to J2EE – Session Beans – Entity Beans – Persistent Entity Beans.

TOTAL: 45 PERIODS

TextBooks1. Elliotte Rusty Harold, " Java Network Programming", O'Reilly publishers, 2000

2. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999.

3. Hortsmann & Cornell, "CORE JAVA 2 ADVANCED FEATURES, VOL II", Pearson Education, 2002.

Reference Books

1.Web reference: http://java.sun.com.

2. Patrick Naughton, "COMPLETE REFERENCE: JAVA2", Tata McGraw-Hill, 2003.

Online Resources

1. www.cs.rit.edu/~jmk/java707/lecnotes/lecnotes.html
2. http://www.inf.ed.ac.uk/teaching/courses/cs2/LectureNotes/CS2Bh/APJ/apj5.pdf
3. http://ebookmaterials.blogspot.in/2011/07/advanced-programming-in-java-lecturer.html

UECSB54 OPEN SOURCE SYSTEMS **L T P C**
3 0 0 3

Course Educational Objective

- To study open source technologies and tools in order to incorporate with the IT industry.
- To know the online web development tools like PHP, MySQL for dynamic web page creation.
- To describe the different web servers and their service providers with different platforms.

Course Outcomes

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Identify the need for open source system and their necessity for moving towards open source system.	**K2**
CO2	Explain the different open source tools and technologies	**K2**
CO3	Provide appropriate open source databases for their applications	**K2**
CO4	Recognize and understand ways of using open source tools and technologies to improve intra and inter-organizational processes.	**K2**
CO5	Understand how open source languages are used for dynamic web page creation in social networking sites.	**K2**

Prerequisite

- **Operating Systems**
- **Computer Networks**
- **Database Management Systems**

Course Content

UNIT I

Introduction:

Need of Open Sources – Advantages of Open Sources – Applications – Commercial aspects of Open Source movement – Certification courses issues. **Open Source Operating Systems:** LINUX – Introduction – General Overview – Kernal mode and User mode process. **Advanced Concepts:** Scheduling, Time Accounting – Personalities – Cloning and Backup your Linux System – Linux Signals – Development with Linux. **Linux Networking:** Configuration Files – Red Hat Linux network GUI configuration tools – Assigning an IP address – Subnets – Route – Tunneling – Useful Linux network commands – Enable Forwarding.

UNIT II

MySQL: Introduction – What is MySQL? - MySQL Data Types - Primary Keys and Auto Increment Fields – Queries - Download MySQL Database - Facts About MySQL database - Connecting to a MySQL Database - writing your own SQL programs - Closing a Connection.

PHP MySQL Create Database and Tables: Create a Database - Create a Table - Insert Data Into a Database Table - Insert Data From a Form into a Database. Record Selection Technology: Select Data From a Database Table - Display the Result in an HTML Table - The WHERE clause - The ORDER BY Keyword – Working with Strings – Date and Time – Working with metadata. **Sorting Query Results:** Sort Ascending or Descending - Order by Two Columns - Update Data In a Database - Delete Data In a Database - Using sequences – MySQL and Web. **Database ODBC:** Create an ODBC Connection - Connecting to an ODBC - Retrieving records - Retrieving Fields from a Record - Closing an ODBC Connection.

UNIT III

PHP Introduction: A Brief History of PHP - Installing PHP - A Walk Through PHP - Installing and Configuring PHP on Windows. **Language Basics:** Lexical Structure -Data Types -Variables -Expressions and Operators – Constants - Flow-Control Statements - Including Code -Embedding PHP in Web Pages **Functions:** Calling a Function - Defining a Function - Variable Scope -Function Parameters - Return Values -Variable Functions - Anonymous Functions. **Strings:** Quoting String Constants - Printing Strings - Accessing Individual Characters -Cleaning Strings - Encoding and Escaping -Comparing Strings - Manipulating and Searching Strings - Regular Expressions.

Arrays : Indexed Versus Associative Arrays - Identifying Elements of an Array - Storing Data in Arrays - Multidimensional Arrays - Extracting Multiple Values - Converting Between Arrays and Variables - Traversing Arrays - Sorting - Acting on Entire Arrays - Using Arrays.

UNIT IV

Objects : Terminology - Creating an Object - Accessing Properties and Methods - Declaring a Class - Introspection – Serialization **Extending PHP:** Architectural Overview - What You'll Need - Building Your First Extensions - The config.m4 File - Memory Management - The pval / zval Data Type - Parameter Handling - Returning Values - References - Global Variables - Creating Variables - Extension INI Entries – Resources. **Databases:** Using PHP to Access a Database - Relational Databases and SQL - Advanced Database Techniques - Sample Applications.

UNIT V

Web Server: Apache Web Server – Working with Web Server – Configuring and using apache web services. **Open source software tools:** Browsers – Processors – Compilers – Model driven architecture tools. **Eclipse IDE platform:** Architecture – History – Simultaneous Releases.

Case Study: E-Governance - Government Policy toward Open Source.

Learning Resources

Text Books

1. The Linux Kernel Book Rem Card,Eric Dumas and Frank Mevel Wiley Publications sons, 2003
2. MySQL Bible Steve Suchring John Wiley sons, 2002

Reference Book

1. Programming PHP Rasmus Lerdorf and Levin Tatroe O'Reilly Publications, 2002

Web References

1. cs.wallawalla.edu/~aabyan/LN/OS/osln.pdf
2. http://cs.wallawalla.edu/~aabyan/LN/OS/osln.pdf

UECSB55 MOBILE ADHOC AND SENSOR NETWORKS **L T P C**
3 0 0 3

Course Educational Objective

- To understand the principles of sensor networks and mobile ad hoc networks, and their impact on protocol design
- To develop MAC and routing protocols for sensor and mobile networks
- To develop efficient protocols for sensor and mobile networks
- To understand and develop information dissemination protocols for sensor and mobile networks

Course Outcomes

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Understanding of the principles of mobile ad hoc networks (MANETs) and what distinguishes them from infrastructure-based networks..	**K2**
CO2	Understanding of the principles and characteristics of wireless sensor networks (WSNs). to balance speed and bandwidth consumption	**K2**
CO3	Understand how proactive routing protocols function and their implications on data transmission delay and bandwidth consumption	**K2**
CO4	Understand how reactive routing protocols function and their implications on data transmission delay and bandwidth consumption	**K2**
CO5	Understand how hybrid routing protocols function and their ability	**K2**

Prerequisite

- Computer Networks

Course Content

UNIT I ROUTING **9**

Cellular and Ad hoc wireless networks – Issues of MAC layer and Routing – Proactive,Reactive and Hybrid Routing protocols – Multicast Routing – Tree based and Meshbased protocols – Multicast with Quality of Service Provision

UNIT II QUALITY OF SERVICE **9**

Real-time traffic support – Issues and challenges in providing QoS – Classification ofQoS Solutions – MAC layer classifications – QoS Aware Routing Protocols – Ticketbased and Predictive location based Qos Routing Protocols

UNIT III ENERGY MANAGEMENT AD HOC NETWORKS **9**

Need for Energy Management – Classification of Energy Management Schemes – Battery Management and Transmission Power Management Schemes – Network Layerand Data Link Layer Solutions – System power Management schemes

UNIT IV MESH NETWORKS **9**

Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic Routing – Self Configuration and Auto Configuration - Capacity Models – Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks

UNIT V SENSOR NETWORKS **9**

Introduction – Sensor Network architecture – Data Dissemination – Data Gathering – MAC Protocols for sensor Networks – Location discovery – Quality of Sensor Networks – Evolving Standards – Other Issues – Recent trends in Infrastructure less Networks

TOTAL = 45 PERIODS

Learning Resources

Text Book

1. C. Siva Ram Murthy and B.S.Manoj, "Ad hoc Wireless Networks – Architectures andProtocols', Pearson Education, 2004

Reference Books

1. Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks", Morgan KaufmanPublishers, 2004
2. C.K.Toh, "Adhoc Mobile Wireless Networks", Pearson Education, 2002.
3. Thomas Krag and Sebastin Buettrich, 'Wireless Mesh Networking', O'ReillyPublishers.

Web References

1. archive.cone.informatik.uni-freiburg.de/.../lecture/.../MANET-01.ppt
2. www.rimtengg.com/coit2007/proceedings/pdfs/122.pdf
3. people.cs.vt.edu/~irchen/6204/.../lecture4-mobile-ad-hoc-networks.p.

UECSB57 VIRTUALIZATION TECHNIQUES **L T P C**
3 0 0 3

Course Educational Objective

Students undergoing this course are expected to

- Computing Virtualization tools, applications and techniques
- Network Virtualization
- Virtualization and Cloud Computing

Course Outcomes

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Explain the basics of Virtualization.	K2
CO2	Discuss the concepts of server virtualization.	K2
CO3	Demonstrate and design network virtualization	K3
CO4	Demonstrate the concepts of virtualization storage.	K2
CO5	Create virtual machines products.	K3

Prerequisite

- Data communication and Computer Networks
- Web Technologies

Course Content

UNIT I OVERVIEW OF VIRTUALIZATION **10**

Basics of Virtualization - Virtualization Types – Desktop Virtualization – Network Virtualization – Server and Machine Virtualization – Storage Virtualization – System-level or Operating Virtualization – Application Virtualization-Virtualization Advantages – Virtual Machine Basics – Taxonomy of Virtual machines - Process Virtual Machines – System Virtual Machines – Hypervisor - Key Concepts

UNIT II SERVER CONSOLIDATION **8**

Hardware Virtualization – Virtual Hardware Overview - Sever Virtualization – Physical and Logical Partitioning - Types of Server Virtualization – Business cases for Sever Virtualization – Uses of Virtual server Consolidation – Planning for Development – Selecting server Virtualization Platform

UNIT III NETWORK VIRTUALIZATION **10**

Design of Scalable Enterprise Networks - Virtualizing the Campus WAN Design – WAN Architecture - WAN Virtualization - Virtual Enterprise Transport Virtualization–VLANs and Scalability - Theory Network Device Virtualization Layer 2 - VLANs Layer 3 VRF Instances Layer 2 - VFIs Virtual Firewall Contexts Network Device Virtualization - Data- Path Virtualization Layer 2: 802.1q - Trunking Generic Routing Encapsulation – Ipsec L2TPv3 Label Switched Paths - Control-Plane Virtualization–Routing Protocols- VRF - Aware Routing Multi-Topology Routing.

UNIT IV VIRTUALIZING STORAGE 8

SCSI- Speaking SCSI- Using SCSI buses – Fiber Channel – Fiber Channel Cables – Fiber Channel Hardware Devices – iSCSI Architecture – Securing iSCSI – SAN backup and recovery techniques – RAID – SNIA Shared Storage Model – Classical Storage Model – SNIA Shared Storage Model – Host based Architecture – Storage based architecture – Network based Architecture – Fault tolerance to SAN – Performing Backups – Virtual tape libraries.

UNIT V VIRTUAL MACHINES PRODUCTS 9

Xen Virtual machine monitors- Xen API – VMware – VMware products – Vmware Features – Microsoft Virtual Server – Features of Microsoft Virtual Server

TOTAL : 45 periods

Learning Resources

.Text Books

1. William von Hagen, Professional Xen Virtualization, Wrox Publications,January, 2008.
2. Chris Wolf , Erick M. Halter, Virtualization: From the Desktop to the Enterprise, APress 2005.

Reference Books

1. Kumar Reddy, Victor Moreno, Network virtualization, Cisco Press, July, 2006.
2. James E. Smith, Ravi Nair, Virtual Machines: Versatile Platforms for Systems and Processes, Elsevier/Morgan Kaufmann, 2005.
3. David Marshall, Wade A. Reynolds, Advanced Server Virtualization:VMware and Microsoft Platform in the Virtual Data Center, Auerbach Publications, 2006.

Web References

1. www.cs.sunysb.edu/~chiueh/cse674/list.pdf
2. www.stanford.edu/class/ee282/handouts/lect.10.vm.pdf
3. grids.ucs.indiana.edu/ptliupages/publications/10-fg-hypervisor.pdf
4. http://www.slideshare.net/sigindia/emc-lecture-session-virtualization-technology-and-directions-9731982

UECSB58 MOBILE APPLICATION AND DEVELOPMENT **L T P C**
3 0 0 3

PRE REQUISITE

Data communication network
TCP/IP

. **COURSE EDUCATIONAL OBJECTIVES**

- To learn the techniques in implementation, software design, and user-interaction design.
- To learn about concepts at the core of modern mobile computing, such as software and data distribution models and location awareness.

COURSE OUTCOME

Upon the successful completion of the course, learners will be able to

COURSE NO.S	COURSE OUTCOME	LEVELS OF LEARNING DOMAINS
CO1	To learn applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.	K2
CO2	To learn the deployment of applications for mobile devices.	K2
CO3	To analyze the languages for mobile specific enhancement	K2
CO4	To define the OS architecture of different mobile platforms	K2
CO5	To design and development of context-aware solutions for mobile devices	K3
CO6	To able to analyse power management and security for mobile devices.	K3

UNIT I **9**

Introduction to mobile devices and Administrator - Mobile devices vs. desktop devices - ARM and intel architectures - Power Management - Screen resolution - Touch interfaces - Application deployment - App Store, Google Play, windows Store - Development environments (XCode , Eclipse , VS2012 , PhoneGAP, etc)- Native vs. web applications

UNIT II **9**

HTML5/JS/CSS3 - Quick recap of technologies - Mobile-specific enhancements (Browser-detection ,Touch interfaces , Geolocation , Screen orientation)- Mobile browser "interpretations" (Chrome/Safari/Gecko/IE) - Sample case studies .

UNIT III **9**

Mobile OS Architectures - Comparing and Contrasting architectures of all three – Android, iOS and Windows - Underlying OS (Darwin vs. Linux vs. Win 8) - Kernel structure and native level programming - Runtime (Objective-C vs. Dalvik vs. WinRT) - Approaches to power management - Security

UNIT IV **9**

Android/iOS/Win 8 Survival, basic apps "(App-structure, built-in Controls, file access, basic graphics), useful apps (DB access, network access, conacts/photos/etc) - Native level programming on Android - Low-level programming on (jailbroken) iOS - Windows low level APIs

UNIT V **9**

Advanced Topics: Power Management - Wake locks and assertions - Low-level OS support - Writing power-smart applications - Augmented Reality via GPS and other sensors (GPS - Accelerometer - Camera)- Mobile device security, in depth (Mobile malware , Device protections , iOS "Jailbreaking", Android "rooting" and Windows' defenestration")

TOTAL = 45 PERIODS

.TEXT BOOK

1. Mark Gargenta, "Learning ANDROID", Oreilly Publication, First Edition, March 2011.

ONLINE RESOURSES

1. vjit.ac.in/new/wp-content/.../Mobile-Application-Development.doc
2. http://www.eli.sdsu.edu/courses/fall09/cs696/notes/index.html
3. http://www.slideshare.net/iivanoo/lecture01-11910341

UECSB59 SOFTWARE TESTING **L T P C**
3 0 0 3

PRE-REQUISITE
Software Engineering and project Management

COURSE EDUCATIONAL OBJECTIVE
- To learn about life cycle models for requirements, defects, test cases, and test results.
- To learn about Process models for unit, integration, system and acceptance testing.

COURSE OUTCOMES:
Upon the successful completion of the course, learners will be able to

COURSE NO.S	COURSE OUTCOME	LEVELS OF LEARNING DOMAINS
CO1	To understand the concept of I/O streaming and threads	
CO2	To analyze Advanced Java Networking concepts	
CO3	To know about IDl technology and Custom sockets	
CO4	To learn Server Side Programming Concepts and JDBC Principles	
CO5	To develop Media Applications, 3D Graphics and to work with Swings	
CO6	To learn J2EE,Session Beans and Entity Beans	

UNIT I INTRODUCTION **9**

Testing as an Engineering Activity – Role of Process in Software Quality – Testing as aProcess – Basic Definitions – Software Testing Principles – The Tester's Role in aSoftware Development Organization – Origins of Defects – Defect Classes – The DefectRepository and Test Design – Defect Examples – Developer/Tester Support forDeveloping a Defect Repository.

UNIT II TEST CASE DESIGN **9**

Introduction to Testing Design Strategies – The Smarter Tester – Test Case DesignStrategies – Using Black Box Approach to Test Case Design Random Testing – Requirements based testing – positive and negative testing –– Boundary ValueAnalysis – decision tables - Equivalence Class Partitioning state-based testing – cause-effect graphing – error guessing - 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 FlowGraphs – Covering Code Logic – Paths – Their Role in White–box Based Test Design – code complexity testing – Evaluating Test Adequacy Criteria.

UNIT III LEVELS OF TESTING **9**

The Need for Levels of Testing – Unit Test – Unit Test Planning –Designing the UnitTests. The Test Harness – Running the Unit tests and Recording results – Integrationtests – Designing Integration Tests – Integration Test Planning – scenario testing – defect bash elimination -System Testing – types

of system testing - Acceptance testing – performance testing - Regression Testing – internationalization testing – ad-hoc testing -Alpha – Beta Tests – testing OO systems – usability and accessibility testing

UNIT IV TEST MANAGEMENT **9**

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

UNIT V CONTROLLING AND MONITORING **9**

Software test automation – skills needed for automation – scope of automation – designand architecture for automation – requirements for a test tool – challenges in automation- Test metrics and measurements –project, progress and productivity metrics – StatusMeetings – Reports and Control Issues – Criteria for Test Completion – SCM – Types ofreviews – Developing a review program – Components of Review Plans– ReportingReview Results. – evaluating software quality – defect prevention – testing maturitymodel

TOTAL = 45 PERIODS

TEXT BOOK

1. Srinivasan Desikan and Gopalaswamy Ramesh, " Software Testing – Principles andPractices", Pearson education, 2006.2. Aditya P.Mathur, "Foundations of Software Testing", Pearson Education,2008.

REFERENCE BOOKS:

1. Boris Beizer, "Software Testing Techniques", Second Edition,Dreamtech, 2003.
2. Elfriede Dustin, "Effective Software Testing", First Edition, Pearson Education, 2003.
3.Renu Rajani, Pradeep Oak, "Software Testing – Effective Methods, Tools andTechniques", Tata McGraw Hill, 2004

ONLINE RESOURCES

1. www.ida.liu.se/~TDDC01/lectureMaterial/PUM-2007april-LC-1.pdf
2. www.cs.aau.dk/~kgl/TOV03/tretmans-notes.PDF
3. www.csus.edu/indiv/v/velianitis/161/SoftwareTesting.ppt