

		<b>K.S.R. COLLEGE OF ENGINEERING (Autonomous)</b> (Approved by AICTE, New Delhi & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode – 637 215				<b>CURRICULUM UG R - 2012</b>	
Programme		I Year B.E. / B.Tech., (Common To All Programmes)					
<b>SEMESTER - I</b>							
Sl. No.	Course Code	Course Name	Hours/ Week			Credit C	
			L	T	P		
<b>THEORY</b>							
1.	12HS1101	Technical English – I (Common To All Branches)	3	0	0	3	
2.	12MA1102	Engineering Mathematics – I (Common To All Branches)	3	1	0	4	
3.	12PH1103	Engineering Physics – I (Common To All Branches)	3	0	0	3	
4.	12CY1104	Engineering Chemistry (Common To All Branches)	3	0	0	3	
5.	12CS1105	Fundamentals of Computing and Programming (Common To All Branches)	3	0	0	3	
6.(a)	12GE2106	Basics of Civil and Mechanical Engineering (Common To CS, EC, EE & IT)	4	0	0	4	
(b)	12ME2106	Engineering Drawing (Common To AU, CE & ME)	1	3	0		
<b>PRACTICAL</b>							
7.		Physics and Chemistry Laboratory * (Common To All Branches)	-	-	3	-	
8.	12CS1110	Computer Practices Laboratory – I (Common To All Branches)	0	0	3	2	
9.(a)	12AU2111	Computer Aided Drawing Laboratory (Common To AU & ME)	0	0	3	2	
(b)	12GE1111	Engineering Practices Laboratory (Common To CE, CS, EC, EE & IT)	0	0	3		
10.	12HR1112	Career Development Skills – I (Common To All Branches)	0	2	0	1	
<b>Total Credits</b>						<b>25</b>	

\* Laboratory Examination only in the II Semester


<b>SEMESTER - II</b>							
<b>THEORY</b>							
1.	12HS1201	Technical English – II (Common To All Branches)	3	0	0	3	
2.	12MA1202	Engineering Mathematics – II (Common To All Branches)	3	1	0	4	
3.	12PH1203	Engineering Physics – II (Common To All Branches)	3	0	0	3	
4.	12CY1204	Environmental Science and Engineering (Common To All Branches)	3	0	0	3	
5.(a)	12EE2205	Basics of Electrical and Electronics Engineering (Common To AU, CE & ME)	3	1	0	4	
(b)	12AU2205	Engineering Graphics (Common To CS, EC, EE & IT)	1	3	0		
6.(a)	12CE2206	Engineering Mechanics (Common To AU, CE & ME)	3	1	0	4	
(b)	12CS3206	Advanced C Programming (For CS branch only)	4	0	0		
(c)	12EE3206	Electric Circuit Analysis (For EE branch only)	3	1	0		
(d)	12EC3206	Electric Circuit Theory (For EC branch only)	3	1	0		
(e)	12IT3206	Programming and Data Structures (For IT branch only)	4	0	0		
<b>PRACTICAL</b>							
7.	12GE1210	Physics and Chemistry Laboratory (Common To All Branches)	0	0	3	2	
8.	12CS1211	Computer Practice Laboratory – II (Common To All Branches)	0	0	3	2	
9. (a)	12GE1212	Engineering Practices Laboratory (Common To AU & ME)	0	0	3	2	
(b)	12AU2212	Computer Aided Drawing Laboratory (For CE branch only)	0	0	3		
(c)	12CS3212	Advanced C Programming Laboratory (For CS branch only)	0	0	3		
(d)	12EE3212	Electric Circuits Analysis Laboratory (For EE branch only)	0	0	3		
(e)	12EC3212	Electric Circuits Laboratory (For EC branch only)	0	0	3		
(f)	12IT3212	Programming and Data Structures Laboratory (For IT branch only)	0	0	3		
10.	12HR1213	Career Development Skills – II (Common To All Branches)	0	2	0	1	
<b>Total Credits</b>						<b>28</b>	

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Department		Computer Science and Engineering					
Programme		B.E. – Computer Science and Engineering					
<b>SEMESTER - III</b>							
Sl. No.	Course Code	Course Name	Hours/ Week			Credit	
			L	T	P		C
<b>THEORY</b>							
1.	12MA3301	Discrete and Engineering Mathematics	3	1	0	4	
2.	12EC2322	Electric Circuits and Electron Devices (Common to CS & IT)	3	1	0	4	
3.	12EC2323	Digital Principles and System Design (Common to CS & IT)	3	0	0	3	
4.	12CS2304	Computer Organization and Architecture (Common to CS & IT)	3	0	0	3	
5.	12CS3305	C++ and Java Programming	3	0	0	3	
6.	12CS3306	Data Structures	3	0	0	3	
<b>PRACTICAL</b>							
7.	12EC3310	Electric Circuits and Electron Devices Laboratory	0	0	3	2	
8.	12CS3311	C++ and Java Programming Laboratory	0	0	3	2	
9.	12CS3312	Data Structures Laboratory	0	0	3	2	
10.	12HR1313	Career Development Skills- III (Common To All Branches)	0	2	0	1	
<b>Total Credits</b>						<b>27</b>	


<b>SEMESTER - IV</b>							
Sl. No.	Course Code	Course Name	Hours/ Week			Credit	
			L	T	P		C
<b>THEORY</b>							
1.	12MA2401	Numerical Methods (Common To AU,CE,CS,EE & ME)	3	1	0	4	
2.	12CS3402	Database Management Systems	3	0	0	3	
3.	12EC2423	Microprocessors and Microcontrollers (Common to CS & IT)	3	0	0	3	
4.	12IT2444	Software Engineering (Common to CS, EC & IT)	3	0	0	3	
5.	12CS2445	Operating Systems (Common to CS, EC & IT)	3	0	0	3	
6.	12CS3406	Theory of Computation	3	0	0	3	
<b>PRACTICAL</b>							
7.	12EC2410	Microprocessors and Microcontrollers Laboratory (Common to CS & IT)	0	0	3	2	
8.	12CS2411	Operating Systems Laboratory (Common to CS & IT)	0	0	3	2	
9.	12CS3412	Database Management Systems Laboratory	0	0	3	2	
10.	12HR1413	Career Development Skills- IV (Common To All Branches)	0	2	0	1	
<b>Total Credits</b>						<b>26</b>	

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Department		Computer Science and Engineering					
Programme		B.E. – Computer Science and Engineering					
<b>SEMESTER - V</b>							
Sl. No.	Course Code	Course Name	Hours/ Week			Credit C	
			L	T	P		
<b>THEORY</b>							
1.	12MA2501	Probability and Queuing Theory (Common to CS & IT)	3	1	0	4	
2.	12IT2502	Object Oriented Analysis and Design (Common to CS & IT)	3	0	0	3	
3.	12CS2503	Computer Networks (Common to CS & IT)	3	0	0	3	
4.	12CS3504	System Software and Compiler Design	3	0	0	3	
5.	12CS3505	Design and Analysis of Algorithms	3	0	0	3	
6.	12CS3506	Multimedia Technologies	3	0	0	3	
<b>PRACTICAL</b>							
7.	12CS2510	Computer Networks Laboratory (Common to CS & IT)	0	0	3	2	
8.	12CS3511	System Software and Compiler Design Laboratory	0	0	3	2	
9.	12CS3512	Multimedia Laboratory	0	0	3	2	
10.	12HR1513	Career Development Skills – V (Common To All Branches)	0	2	0	1	
<b>Total Credits</b>						<b>26</b>	

<b>SEMESTER - VI</b>							
Sl. No.	Course Code	Course Name	Hours/ Week			Credit C	
			L	T	P		
<b>THEORY</b>							
1.	12HS3601	Engineering Economics and Financial Accounting	3	0	0	3	
2.	12CS2642	C# and .Net Framework (Common to CS & IT)	3	0	0	3	
3.	12EC3623	Wireless Communication Networks	3	0	0	3	
4.	12CS3604	Distributed Computing	3	1	0	4	
5.	12CS3605	PC Hardware, Installation, Trouble Shooting and Servicing	3	0	0	3	
6.		Elective – I	3	0	0	3	
<b>PRACTICAL</b>							
7.	12CS3610	C# and .Net Laboratory	0	0	3	2	
8.	12CS3611	Case Tools Laboratory	0	0	3	2	
9.	12CS3612	Open Source Software Laboratory	0	0	3	2	
10.	12CS3613	Comprehension	0	2	0	1	
<b>Total Credits</b>						<b>26</b>	


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Department		Computer Science and Engineering					
Programme		B.E. – Computer Science and Engineering					
<b>SEMESTER - VII</b>							
Sl. No.	Course Code	Course Name	Hours/ Week			Credit C	
			L	T	P		
<b>THEORY</b>							
1.	12HS1701	Professional Ethics (Common to All Branches)	3	0	0	3	
2.	12CS3702	Cryptography and Network Security	3	0	0	3	
3.	12CS3703	Internet Programming	3	0	0	3	
4.	12CS3704	Mobile and Pervasive Computing	3	0	0	3	
5.		Elective – II	3	0	0	3	
6.		Elective – III	3	0	0	3	
<b>PRACTICAL</b>							
7.	12CS3710	Internet Programming Laboratory	0	0	3	2	
8.	12CS3711	Mini Project	0	0	3	2	
<b>Total Credits</b>						<b>22</b>	

<b>SEMESTER - VIII</b>							
Sl. No.	Course Code	Course Name	Hours/ Week			Credit C	
			L	T	P		
<b>THEORY</b>							
1.	12IT2841	Cloud Computing (Common to CS & IT)	3	0	0	3	
2.		Elective – IV	3	0	0	3	
3.		Elective – V	3	0	0	3	
<b>PRACTICAL</b>							
4.	12CS3810	Project Work	0	0	12	6	
<b>Total Credits</b>						<b>15</b>	

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Department		Computer Science and Engineering				
Programme		B.E. – Computer Science and Engineering				
<b>List of Electives</b>						
<b>ELECTIVE – I (SEMESTER VI)</b>						
Sl. No.	Course Code	Course Name	Hours/ Week			Credit
			L	T	P	C
<b>THEORY</b>						
1.	12EC4601	Analog and Digital Communication	3	0	0	3
2.	12CS4602	Advanced Computer Architecture	3	0	0	3
3.	12CS4603	Component Based Technology (Common to CS & IT)	3	0	0	3
4.	12CS4604	Software Requirements Engineering	3	0	0	3
5.	12CS4605	Real Time Systems	3	0	0	3

<b>ELECTIVE – II (SEMESTER VII)</b>						
Sl. No.	Course Code	Course Name	Hours/ Week			Credit
			L	T	P	C
<b>THEORY</b>						
1.	12EC4741	Digital Image Processing (Common to CS, EC & IT)	3	0	0	3
2.	12IT4702	Enterprise Resource Planning (Common to CS & IT)	3	0	0	3
3.	12CS4703	Data Warehousing and Data Mining	3	0	0	3
4.	12CS4704	Knowledge Based Decision Support System (Common to CS & IT)	3	0	0	3
5.	12CS4705	Artificial Intelligence (Common to CS & IT)	3	0	0	3

<b>ELECTIVE – III (SEMESTER VII)</b>						
Sl. No.	Course Code	Course Name	Hours/ Week			Credit
			L	T	P	C
<b>THEORY</b>						
6.	12IT4706	Electronic Commerce (Common to CS & IT)	3	0	0	3
7.	12CS4707	Grid Computing (Common to CS & IT)	3	0	0	3
8.	12CS4708	Soft Computing (Common to CS & IT)	3	0	0	3
9.	12IT4709	Advanced Database Technology (Common to CS & IT)	3	0	0	3
10.	12CS4710	TCP/IP Suite	3	0	0	3

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Department		Computer Science and Engineering				
Programme		B.E. – Computer Science and Engineering				
<b>ELECTIVE – IV (SEMESTER VIII)</b>						
Sl. No.	Course Code	Course Name	Hours/ Week			Credit
			L	T	P	C
<b>THEORY</b>						
1.	12CS4801	Management Information Systems	3	0	0	3
2.	12CS4802	Green Computing (Common to CS & IT)	3	0	0	3
3.	12CS4803	Nano Computing (Common to CS & IT)	3	0	0	3
4.	12CS4804	3D Modeling and Rendering	3	0	0	3
5.	12CS4805	Service Oriented Architecture	3	0	0	3

<b>ELECTIVE – V (SEMESTER VIII)</b>						
Sl. No.	Course Code	Course Name	Hours/ Week			Credit
			L	T	P	C
<b>THEORY</b>						
6.	12HS4821	Total Quality Management (Common to CS, IT, AU, CE, EE & ME)	3	0	0	3
7.	12CS4807	Quantum Computing	3	0	0	3
8.	12CS4808	Natural Language Processing (Common to CS & IT)	3	0	0	3
9.	12CS4809	Ethical Hacking (Common to CS & IT)	3	0	0	3
10.	12CS4810	High Speed Networks	3	0	0	3
11.	12CS4811	Big Data Analytics	3	0	0	3

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – I****TECHNICAL ENGLISH – I**

(Common To All Branches)

L	T	P	C
3	0	0	3

**12HS1101**

**Objective(s):** To encourage students to actively involve in participative learning of English and to help them acquire Communication Skills through improvement of LSRW skills

**UNIT – I LANGUAGE FOCUS 10 Hrs**

General and Technical Vocabulary - Parts of Speech - Changing from one form to another – Compound Nouns – Numerical Adjectives – Prefix Suffix – Tenses – British And American Vocabulary – Kinds of Sentences – Question Pattern – 'Wh' Question – Yes/No Question.

**UNIT – II LANGUAGE FOCUS 10 Hrs**

Articles – Tense – Active, Passive and Impersonal Passive voice – Gerunds and Infinitives, Cause and Effect, Purpose and Function – Linking Devices (Comparison, Contrast, Additive and Sequential Relation) – Homonyms – Aux. Verbs – One Line Definition.

**UNIT – III READING 07 Hrs**

Skimming – Scanning for Specific Information – Inference – Context Based Meaning – Statistical Interpretation – Graphic Forms / Flow Charts – Tabular Column – Spelling and Punctuation.

**UNIT – IV WRITING 11 Hrs**

Description of Objects – Checklist – Need Based Correspondence (requisition for joining hostel, bonafide certificate, permission for Industrial Visit, to attend a program, etc), Making Complaints – Letter of Invitation – Permission Letter – Pictorial representations based on Information – Tables, Flow Chart, etc - Hints Development.

**UNIT – V LISTENING 07 Hrs**

Listening to News – Understand and Present (Problems) – Critical Analysis – Implications – Listening to Dialogues – Listening to Telephonic Conversation.

**Total Hours: 45****Text Book:**

1. Division of Humanities and Social Sciences Anna University, Chennai, English for Engineers and Technologists (Vols. I & II combined edition) Orient Longmans Rept. (2008).

**Reference:**

1. Dr. S. Sumant, Technical English I, Tata McGraw Hill, Chennai (2012).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**  
**SEMESTER – I**

**ENGINEERING MATHEMATICS – I**  
(Common To All Branches)

	L	T	P	C
<b>12MA1102</b>	3	1	0	4

**Objective(s):** On completion of the course, the students are expected, to apply advanced matrix knowledge to engineering problems, to expose the concept of three dimensional analytical geometry, to improve their ability in solving geometrical applications of differential calculus problems, to equip themselves familiar with the functions of several variables, to understand double and triple integrations and enable them to handles integrals of higher orders.

**UNIT – I      MATRICES      12 Hrs**

Characteristic equation – Eigen values and eigen vectors of a real matrix – Properties of eigen values and eigen vectors (without proof) – Cayley-Hamilton theorem (statement only) and its applications – Orthogonal transformation of a symmetric matrix to diagonal form – Nature of Quadratic form – Reduction of quadratic form to canonical form by orthogonal transformation.

**UNIT – II      THREE DIMENSIONAL ANALYTICAL GEOMETR      12 Hrs**

Direction cosines and ratios – Angle between two lines –Equation of a straight line – Coplanar lines – Shortest distance between skew lines - Equation of a plane – Equation of a sphere – Plane section of a sphere – Tangent Plane – Orthogonal spheres.

**UNIT – III      DIFFERENTIAL CALCULUS      12 Hrs**

Curvature in Cartesian co-ordinates – radius of curvature – Centre of curvature and Circle of curvature – Involutives and Evolutives – Envelopes – Properties of envelopes and evolutives - Evolute as envelope of normals.

**UNIT – IV      FUNCTIONS OF SEVERAL VARIABLES      12 Hrs**

Partial derivatives – Euler’s theorem for homogenous functions – Total derivatives – differentiation of implicit functions – Jacobians – Taylor’s expansion – Maxima and Minima – Method of Lagrangian multipliers

**UNIT – V      MULTIPLE INTEGRALS      12 Hrs**

Double integration – Cartesian and polar coordinates – Change of order of integration – Change of variables between Cartesian and polar coordinates – Triple integration in Cartesian co-ordinates – Area as double integral – Volume as triple integral.

L = 45 T = 15 Total Hours: 60

**Text Book :**

1. Ravish R Singh and Mukul Bhatt, Engineering Mathematics - I, Third Edition, Mcgraw Hill Publications, New Delhi (2012)

**References :**

1. Grewal B.S, Higher Engineering Mathematics, Tata Mcgraw Hill Publishing Company, New Delhi (2007).
2. Erwin Kreyszig, Advanced Engineering Mathematics, 7<sup>th</sup> Edition, Wiley India, (2007).
3. Bali N. P and Manish Goyal, Text book of Engineering Mathematics I & II, Third edition, Laxmi Publications(p) Ltd.(2008).



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – I****ENGINEERING PHYSICS – I**

(Common To All Branches)

L	T	P	C
3	0	0	3

**12PH1103****Objective(s):** *On completion of the course, the student will be able to:*

- Understand the fundamentals of Physics that have a direct application in the field of Engineering.
- Compute and analyze various problems related to Engineering Physics.
- Understand the properties, production of Ultrasonic waves and their application in non-destructive testing and Sonogram.
- Understand the basic configuration of Laser, different types of lasers and their industrial applications
- Know the principle behind the fiber optic communication and the applications of optical fiber in sensors.
- Know the basic equations of Quantum mechanics and different types of Electron microscopes.

**UNIT – I ACOUSTICS****09 Hrs**

Introduction – Classification of sound – Characteristics of musical sound – Loudness – Weber – Fechner law – Decibel – Absorption coefficient – Reverberation – Reverberation time – Sabine's formula: growth & decay (derivation) – Factors affecting acoustics of buildings (reverberation time, loudness, focusing, echo, echelon effect, resonance and noise) and their remedies

**UNIT – II ULTRASONICS****09 Hrs**

Introduction – Production – magnetostriction effect - magnetostriction generator - piezoelectric effect - piezoelectric generator-Detection of ultrasonic waves – properties – Cavitations - Velocity measurement – acoustic grating - Industrial applications –drilling, welding, soldering and cleaning – SONAR - Non Destructive Testing – pulse echo system through transmission and reflection modes -A,B and C –scan displays, Medical applications – Sonograms.

**UNIT – III LASERS AND APPLICATIONS****09 Hrs**

Introduction – Principle of Spontaneous emission and stimulated emission- Population inversion, pumping - Einstein's A and B coefficients (derivation). Types of lasers – He - Ne, CO<sub>2</sub> , Nd-YAG, Semiconductor lasers (homojunction & heterojunction) – Qualitative Industrial Applications - Lasers in welding, heat treatment, cutting – Medical applications - Holography (construction & reconstruction).

**UNIT – IV FIBER OPTICS & APPLICATIONS****09 Hrs**

Principle and propagation of light in optical fibers – Numerical aperture and Acceptance angle (derivation) - Types of optical fibers (material, refractive index, mode) – Double crucible technique of fiber drawing - Splicing, Loss in optical fiber – attenuation, dispersion, bending –Fiber optical communication system (Block diagram) – Light sources - Detectors - Fiber optic sensors – temperature & displacement -Endoscope.

**UNIT – V QUANTUM PHYSICS****09 Hrs**

Black body radiation – Planck's theory (derivation) – Deduction of Wien's displacement law and Rayleigh – Jeans' Law from Planck's theory – Compton effect - Theory and experimental verification – Matter waves – Schrödinger's wave equation – Time independent and time dependent equations – Physical significance of wave function – Particle in a one dimensional box - Electron microscope – Scanning electron microscope - Transmission electron microscope

**Total Hours: 45****Text Books:**

1. Dr.G.Senthil Kumar, Engineering Physics – I VRB Publishers Pvt Ltd, (2009).
2. M.N. Avadhanulu and P.G.Kshirsagar, A Text Book of Engineering Physics, S. Chand & Co, New Delhi (2005).

**References:**

1. Dr. P. Mani, Engineering Physics, Dhanam Publications, Chennai (2007).
2. Brij Lal and Subramaniam, Text Book of Sound, S. Chand & Co Ltd, New Delhi (2005)
3. Dr. P. Mani, Engineering Physics – I, Dhanam Publications, Chennai, (2012).
4. S. Selladurai, Engineering Physics-I, PHI Learning Pvt, Ltd., New Delhi, (2010).
5. Dr.S.Muthukumar, G.Balaji and S.Masilamani, Engineering Physics- I, Sri Krishna HI—Tech Publishing company Pvt. Ltd. (2010).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – I****ENGINEERING CHEMISTRY**

(Common To All Branches)

L T P C

**12CY1104**

3 0 0 3

**Objective(s):** *The student should be conversant with the principles of water characterization and treatment of water for potable and industrial purposes, polymer chemistry and engineering applications of polymers, corrosion and its control, non-conventional energy sources and energy storage devices and chemistry of fuels.*

**UNIT – I WATER TREATMENT****09 Hrs**

Characteristics – Alkalinity – types of alkalinity and determination; Hardness – units, types and estimation by EDTA method (problems); Boiler feed water – requirements, disadvantages of using hard water in boilers, internal conditioning and external conditioning – zeolite process and demineralization process; Domestic water treatment; Desalination – Reverse Osmosis and Electrodialysis.

**UNIT – II POLYMERS AND COMPOSITES****09 Hrs**

Polymers – definition; Polymerization – types – addition and condensation polymerization – free radical polymerization mechanism; Plastics – classification, preparation, properties and uses of bakelite, polycarbonate, polyurethane, nylon-6,6, PET; Compounding and Fabrication of Polymers – Compression and Injection moulding; Rubber – vulcanization of rubber, synthetic rubbers – butylrubber and SBR; Composites – definition, types, polymer matrix composites – FRP only.

**UNIT – III CHEMISTRY OF CORROSION AND ITS CONTROL****09 Hrs**

Introduction – Electrochemical cells – reversible and irreversible cells; Electrochemical series – significance; Corrosion – chemical corrosion – Pilling-Bedworth rule, electrochemical corrosion – mechanism, galvanic corrosion and differential aeration corrosion; Factors influencing corrosion; Corrosion control – cathodic protection methods, corrosion inhibitors and protective coatings – preliminary treatment, Paints – constituents and functions; Metallic coatings – Electroplating (Au) and Electroless plating (Ni).

**UNIT – IV NON-CONVENTIONAL ENERGY SOURCES AND STORAGE DEVICES****09 Hrs**

Energy resources – growing energy needs; Nuclear energy – fission and fusion reactions; Light water nuclear reactor for power generation and breeder reactor; Solar energy conversion – solar cells; Wind energy; Fuel cells – hydrogen – oxygen fuel cell; Batteries – alkaline batteries, lead–acid, nickel–cadmium and lithium batteries.

**UNIT – V FUELS AND COMBUSTION****09 Hrs**

Fuels – calorific value, gross and net calorific values (problems); Coal – proximate and ultimate analyses; Metallurgical coke – manufacture by Otto- Hoffmann method; Petrol – fractional distillation, cracking-types; Synthetic petrol – Bergius and Fischer Tropsch process; Knocking – octane number and cetane number; Flue gas analysis – Orsat gas apparatus; Theoretical air for combustion (problems).

**Total Hours: 45****Text Books:**

1. P.C. Jain and Monica Jain, Engineering Chemistry, Dhanpat Rai Pub. Co., New Delhi, 15<sup>th</sup> Edition (2009).
2. S.S.Dara, A Text book of Engineering Chemistry, S.Chand & Co.Ltd., New Delhi (2005).

**References:**

1. B. Sivasankar, Engineering Chemistry, Tata McGraw-Hill Pub. Co. Ltd., New Delhi (2008).
2. B.K. Sharma, Engineering Chemistry, Krishna Prakashan Media (P) Ltd., Meerut (2001).
3. N. Krishnamurthy, P. Vallinayagam and D. Madhavan, Engineering Chemistry, PHI Learning Private Ltd, New Delhi (2009).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – I****FUNDAMENTALS OF COMPUTING AND PROGRAMMING**

(Common To All Branches)

L T P C

**12CS1105**

3 0 0 3

**Objective(s):** To equip students with comprehensive knowledge of computer fundamentals and C programming so that they can develop programs on their own for various applications.

**UNIT – I INTRODUCTION TO COMPUTERS 09 Hrs**

Introduction – Characteristics of Computers – Evolution of Computers – Generations of Computers – Classification of Computers – Application of Computers – Components of Computer System and Specifications – Number Systems: Natural Numbers – Integers – Decimal – Binary – Octal – Hexadecimal – Conversion of one number system to other number system – BCD – Excess 3 – Gray Code – Alphanumeric Codes – 1's and 2's Complements

**UNIT – II COMPUTER SOFTWARE AND PROBLEM SOLVING 09 Hrs**

Computer Software – Categories of Software – Software Development Steps – Internet Evolution – Basic Internet Terms – Types of Internet Connection – Internet Services – Program Development Lifecycle – Algorithm – Flow Charts – Pseudo code – Programming Languages

**UNIT – III INTRODUCTION TO C 09 Hrs**

Introduction to C – Structure of C Program – programming Rules – Executing the program– C Declaration – Character Set – Delimiters – Keywords – Identifiers – Constants – Data Types – Variables : Definition – Declaration – Initialization – Type Conversion – Constant and Volatile – Operators and Expressions – Input and Output in C – Decision Making Statements - Branching and Loop Control Statements – Storage Classes

**UNIT – IV ARRAYS, FUNCTIONS AND STRUCTURES 09 Hrs**

Arrays: Introduction – Definition – Types – Functions – Introduction – Declaration and Prototype – Types – Call by Value – Call by Reference – Recursive Function – Working with Strings and Standard Functions – Structures and Unions : Introduction – Features – Declaration and Initialization – Structure within Structure – Array of Structure – Structure and Function – Enumerated Data Type – Union.

**UNIT – V POINTERS AND FILES 09 Hrs**

Pointers: Introduction – Features – Declaration – Arithmetic Operations – Array of Pointers – Pointers to Functions – Pointer to Structures – Pointer to Pointer – Void Pointer – Files: Introduction – Types – Steps for File Operation – File I/O – Command Line Arguments – The Preprocessor Directives.

**Total Hours: 45****Text Books :**

1. Ashok.N.Kamthane,Computer Programming, Pearson Education – India,(2008).
2. B.L. Juneja and A. Seth, Computer Fundamentals and C Programming, Cengage Learning India,(2012).

**References :**

1. Pradip Dey, Manas Ghosh, Programming in C, Oxford University Press (2007).
2. Byron Gottfried, Programming with C, 2nd Edition, TMH publications, (2006).
3. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Pearson Education Inc., (2005).
4. Alexis Leon, Mathews Leon,Introduction to Computers, Leon Techworld,(2009).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – I**

**BASICS OF CIVIL AND MECHANICAL ENGINEERING**

(Common To CS, EE, EC & IT)

L	T	P	C
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**12GE2106**

**Objective(s)** *Basic civil and Mechanical Engineering is a foundation for Civil and Mechanical Engineering disciplines. This course is designed to enable the students to acquire fundamental knowledge in these two disciplines*

**UNIT – I SURVEYING AND CIVIL ENGINEERING MATERIALS 15 Hrs**

Surveying: Objects – Types – Classification – Principles – Measurements of Distances – Angles – Leveling – Determination of Areas – Illustrative Examples. Civil Engineering Materials: Bricks – Stones – Sand – Cement – Concrete – Steel Sections.

**UNIT – II BUILDING COMPONENTS AND STRUCTURES 15 Hrs**

Foundations: Types, Bearing Capacity – Requirement of Good Foundations- Superstructure – Types of Bridges and Dams - Brick Masonry – Stone Masonry – Beams – Columns – Lintels – Roofing – Flooring – Plastering – Mechanics – Internal and External Forces – Stress – Strain – Elasticity.

**UNIT – III POWER PLANT ENGINEERING 10 Hrs**

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

**UNIT – IV I C ENGINES 10 Hrs**

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

**UNIT – V REFRIGERATION AND AIR CONDITIONING SYSTEM 10 Hrs**

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

**Total Hours: 60**

**Text Books:**

1. Ramesh Babu, Basic Civil and Mechanical Engineering, VRB Publishers (2011).
2. G.Shanmugam and M.S.Palanichamy, Basic Civil and Mechanical Engineering, TMH Publishing Co., New Delhi (1996).

**References:**

1. S.Seetharaman, Basic Civil Engineering, Anuradha Agencies (2005).
2. S.Ramamrutham, Basic Civil Engineering, Dhanpat Rai Publishing Co. (P) Ltd. (1999).
3. K. Venugopal and V. Prahua Raja, Basic Mechanical Engineering, Anuradha Publishers, Kumbakonam, (2000).
4. S.R.J. Shantha Kumar, Basic Mechanical Engineering, Hi-tech Publications, Mayiladuthurai, (2000).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – I****ENGINEERING DRAWING**

(Common To AU, CE &amp; ME)

	L	T	P	C
<b>12ME2106</b>	1	3	0	4

**Objective(s):** To develop students' graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

**UNIT – I PLANE CURVES AND ORTHOGRAPHIC PROJECTION 15 Hrs**

Introduction on drafting instruments, BIS conventions and specifications, Lettering and Dimensions – Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes– Drawing of tangents and normal to the above curves. Representation of Three Dimensional objects – General principles of orthographic projection – First angle projection.

**UNIT – II PROJECTION OF POINTS, LINES AND PLANE SURFACES 15 Hrs**

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to any one reference plane.

**UNIT – III PROJECTION OF SOLIDS 15 Hrs**

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

**UNIT – IV SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 15 Hrs**

Sectioning of above solids in simple vertical position by cutting planes 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, cylinders and cones.

**UNIT – V ISOMETRIC AND PERSPECTIVE PROJECTIONS 15 Hrs**

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones. Perspective projection of prisms, pyramids and cylinders by visual ray method.

**Total Hours: 75****Text Books:**

1. K. V. Natarajan, A text book of Engineering Graphics, Dhanalakshmi Publishers, Chennai (2006).
2. M.S. Kumar, Engineering Graphics, D.D. Publications, (2007).

**References:**

1. Venugopal & V. Prabhu Raja, Engineering Graphics, New Age International (P)Limited (2008).
2. N.D. Bhatt, Engineering Drawing, Charotar Publishing House, 46<sup>th</sup> Edition, (2003).
3. B. Shah and B.C. Rana, Engineering Drawing, Pearson Education (2005).
4. K. R. Gopalakrishna, Engineering Drawing, (Vol.I & II), Subhas Publications (1998).
5. Basant Agarwal and C.M. Agarwal, Engineering Drawing, Tata McGraw Hill Publishing Company Limited, New Delhi, (2008).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – I**

**PHYSICS AND CHEMISTRY LABORATORY**

(Common To All Branches)

**12GE1210**

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0 0 3 -

**Objective(s):** *To gain practical knowledge in the following experiments*

**List of Experiments in Physics Laboratory**

1. Determination of wavelength of laser using grating and angle of divergence of the laser beam
2. Determination of acceptance angle and numerical aperture of an optical fiber
3. Determination of thickness of the material by air – wedge method
4. Determination of velocity of Ultrasonic waves and compressibility using ultrasonic interferometer
5. Determination of wavelength of mercury spectrum by Spectrometer grating
6. Determination of thermal conductivity of a bad conductor by Lee's disc method

**List of Experiments in Chemistry Laboratory**

1. Estimation of Hardness in Water by EDTA Method
2. Estimation of Copper in Brass by EDTA Method
3. Estimation of Dissolved Oxygen (DO) in Water by Winkler's Method
4. Estimation of Chloride in Water Sample by Argentometry
5. Estimation of Alkalinity of Water Sample
6. Determination of Molecular Weight and Degree of Polymerization using Viscometry

**Total Hours: 45**

**References:**

1. Dr.G.Senthilkumar, Physics Lab manual, VRB Publications Pvt. Ltd.,(2006).
2. J.B. Yadav , Advanced Practical Physical Chemistry, GOEL Publishing House.
3. Gurdeep Raj, Advanced Practical Inorganic Chemistry, GOEL Publishing House.

**Note:** A Minimum of FIVE experiments shall be offered in each Laboratory Laboratory classes on alternate weeks for Physics and Chemistry

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – I**

**COMPUTER PRACTICES LABORATORY - I**

(Common To All Branches)

**12CS1110**

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0 0 3 2

**Objective(s):** *To gain practical knowledge in the following experiments.*

**LIST OF EXPERIMENTS**

1. Study Experiment

- Hardware Specification and PC Assembly
- Getting connected to Internet

2. Word processing

- Documentation Creation, Text Manipulation with Scientific Notation
- Table Creation, Table Formatting and Conversion
- Mail Merge
- Flow Chart Preparation.

3. Spread Sheet

- Charts – Bar Chart, Pie Chart, Line Chart, X,Y – Chart
- Object Inclusion, Picture and graphics
- Protecting the Document

4. Power Point Presentation and Access

- Creation of Presentation
- Generation of Report using Access

5. C Programming

- Simple C Program with Data Types, Expressions and Comment Lines
- Programming with Conditional Statements
- Programming with Branching and Looping Statements
- Programming with Arrays and Structures
- Programming with Functions and Pointers

**Total Hours: 45**

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – I**

**COMPUTER AIDED DRAWING LABORATORY**

(Common To AU & ME)

**12AU2111**

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0 0 3 2

**Objective(s):** *To gain practical knowledge in the following experiments*

**LIST OF EXPERIMENTS**

1. Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a Title Block with necessary text and projection symbol.
3. Drawing of curves like parabola, spiral, involute using B spline or cubic spline
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning.
5. Drawing front view, top view and side view of objects from the given pictorial views (e. g. V-block, Base of a mixie, Simple stool, Objects with hole and curves)
6. Drawing of a plan of residential building ( Two bed rooms, kitchen, hall, etc.)
7. Drawing of a simple steel truss.
8. Drawing sectional views of prism, pyramid, cylinder, cone, etc
9. Drawing isometric projection of simple objects.
10. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

Note:

Plotting of drawings must be made for each exercise and attached to the records written by students

**Total Hours: 45**



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – I****ENGINEERING PRACTICES LABORATORY**

(Common To CE, CS, EC, EE &amp; IT)

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**12GE1111**

0 0 3 2

**Objective(s):** To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

**GROUP A (CIVIL & MECHANICAL)**

<b>Plumbing:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Study of Plumbing tools and accessories.</li> <li>b) Preparation of plumbing line sketches for water supply and sewage works.</li> <li>c) Hands-on-exercise - Basic pipe connections – Mixed pipe material connection.</li> </ul>	
<b>Carpentry:</b>	<b>5 Hrs</b>
<ul style="list-style-type: none"> <li>a) Study of Carpentry tools.</li> <li>b) Hands-on-exercise - Wood work, joints by sawing, planning and cutting.</li> </ul>	
<b>Welding:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Preparation of arc welding of butt joints, lap joints and tee joints.</li> <li>b) Gas welding practice.</li> </ul>	
<b>Basic Machining:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Simple Turning and Taper turning.</li> <li>b) Drilling Practice.</li> </ul>	
<b>Sheet Metal Work:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Model making – Trays, funnel and Cone.</li> </ul>	
<b>Demonstration on:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Smithy operations, upsetting, swaging, setting down and bending.</li> <li>b) Foundry operations like mould preparation for gear and step cone pulley.</li> <li>c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.</li> <li>d) Centrifugal pump and Window Air Conditioner</li> </ul>	

**LIST OF EXPERIMENTS:**

1. Study of Carpentry tools, Welding tools, Sheet metal tools, Plumbing tools and Basic Machining tools.
2. To make a Tee joint from the given wooden piece.
3. To make a Lap joint/dovetail joint from the given wooden piece.
4. To make a butt joint using arc welding.
5. To make a Lap joint/Tee joint using arc welding.
6. To prepare a tray (square/rectangular) from the given tin sheet metal.
7. To prepare cone/funnel from the given tin sheet metal.
8. To prepare the mixed pipe (GI&PVC) connections for shower set from the main water supply.
9. To make a thread on given (GI&PVC) pipe and prepare the connections for wash basin from the main water supply.
10. To make plain/step turning on a given MS rod by using Lathe.
11. Make drilling and tapping operation on a given MS plate by using drilling machine.
12. Demonstration – Draw a neat sketch and explain the working principle of
  - a) Smithy Operation
  - b) Mould Preparation
  - c) Square and Vee fitting Operation
  - d) Centrifugal Pump
  - e) Window Air Conditioner

(contd..)

**GROUP B (ELECTRICAL and ELECTRONICS)**

**LIST OF EXPERIMENTS**

**ELECTRICAL ENGINEERING:**

**10 Hrs**

1. Residential House Wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent Lamp Wiring.
3. Stair-Case Wiring
4. Measurement of Electrical Quantities – Voltage, Current, Power & Power Factor in RLC circuit.
5. Measurement of Energy using Single Phase Energy Meter.
6. Study of Ceiling Fan, Iron Box and Emergency Lamp

**ELECTRONICS ENGINEERING:**

**10 Hrs**

1. Study of Electronic Components and Equipments – Resistor Colour Coding
2. Measurement of AC Signal Parameters (peak-peak, rms value, time period, frequency) using CRO.
3. Study of logic gates AND, OR, ExOR and NOT.
4. Soldering Practice – Components Devices and Circuits – Using general purpose PCB.
5. Construction of Half Wave and Full Wave Rectifier

. Total Hours: 45

**References:**

1. K.Jeyachandran, S.Natarajan and S, Balasubramanian, A Primer on Engineering Practices laboratory, Anuradha Publications, (2007).
2. T.Jeyapooan, M.Saravanapandian & S.Pranitha, Engineering Practices Lab Manual, Vikas Publishing House Pvt.Ltd, (2006)
3. H.S. Bawa, Workshop Practice, Tata McGraw – Hill Publishing Company Limited, (2007).
4. Rajendra Prasad & P.M.M.S. Sarma, Workshop Practice, Sree Sai Publication, (2002).
5. P.Kannaiah & K.L.Narayana, Manual on Workshop Practice, Scitech Publications, (1999).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – I****CAREER DEVELOPMENT SKILLS – I**

(Common To All Branches)

<b>12HR1112</b>	L	T	P	C
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**Objective(s):** To make the students aware about their career and expose them to the concepts of communication and practice through interactive soft ware and to enable them understand about themselves and provide them with Experiential Learning.

**UNIT – I CAREER AWARENESS 3 Hrs**

Career Planning – Career Options – Importance of Career Planning – General Awareness about the Course and Opportunities (Engineering Dept) – Basic Life Skills – Self introduction (Activity on Self Introduction).

**UNIT – II STORY TELLING AND ROLE PLAY 7 Hrs**

Listening to Stories and Contextual Conversations – Narrative Techniques & Developing Situations – Summarizing Abilities – Tenses for Storytelling – Specific Vocabulary – Body Language. (Activity on Story Telling and Role Play).

**UNIT – III SELF ESTEEM AND ATTITUDE 7 Hrs**

Term Self Esteem – Signs of Self Esteem – Advantages – Do's and Don'ts to Develop Positive Self esteem – Low Self-esteem – Symptoms – Positive and Negative Self-esteem. Building Positive Attitude – Importance – Measures of Attitude – Confidence Building Techniques.

**UNIT – IV BASIC ETIQUETTES 3 Hrs**

Dress Code – Behavioral Skills – Personal Etiquette (Cleanliness, Dining / Table Manners, Dressing / Grooming, etc.) – Social Etiquette (Polite Talk, Manners).

**UNIT – V COMMUNICATION ESSENTIALS 10 Hrs**

Listening Skills (Active Listening) – Voice and Accent – Body language (Non-Verbal Communication) – Pronunciation Practice (Activity – Using Interactive Software for Communication Skills in the Language Laboratory).

**Total Hours: 30****Text Book(s):**

1. Jeff Butterfield, Soft Skills for Everyone, Cengage Learning India pvt Ltd, New Delhi, (2011).

**References:**

1. Bhatnagar Nitin, Communicative English for Engineers and Professionals, ISBN 9788131732045, Pearson Publication, New Delhi (2010).
2. V.Sasikumar, P.Kiranmai Dutt & Geetha Rajeevan, Listening & Speaking, ISBN 9788175963344, Pearson Education, New Delhi, (2007).
3. V.Sasikumar Spoken English: A Self-Learning Guide to Conversation Practice, Tata McGraw Hill Publishing Company Limited, New Delhi. (2011).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – II**

**TECHNICAL ENGLISH - II**

(Common To All Branches)

<b>12HS1201</b>	L	T	P	C
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**Objective(s):** To encourage students to actively involve in participative learning of English and to help them acquire Communication Skills through improvement of LSRW skills

**UNIT – I LANGUAGE FOCUS 10 Hrs**

Technical Vocabulary – Adjectives (Comparatives) – Conjunction, Preposition- Clauses (Simple, Compound Complex) – SI Units – Abbreviation & Acronyms – Homophones- Idioms – Foreign Words and Phrases – Phrasal Verbs

**UNIT – II LANGUAGE FOCUS 10 Hrs**

Relative Clauses – Imperative – Adverbial Clauses of Time, Place and Manner – Intensifiers – Basic Patterns of Sentences – One Word Substitution - 'If' Conditionals – Correction of Errors – Concord – Reported Speech

**UNIT – III READING 7 Hrs**

Intensive Reading – Predicting Content – Interpretation – Inference from the Text (Implication) – Inferential Information – Implication – Critical Interpretation – Reading Brief Notices, Notices - Advertisement and The Implication

**UNIT – IV WRITING 11 Hrs**

Paragraph Writing – Letter Writing – Job Application and Resume, Business Correspondence - Instructions – E-mail Writing – Process Description – Transcoding of Information from Pie Chart, Bar Chart, etc.

**UNIT – V SPEAKING 7 Hrs**

Stress and Intonation – Introducing oneself – Introducing others – Oral Instructions

**Total Hours: 45**

**Text Book:**

1. Division of Humanities and Social Sciences Anna University, Chennai, English for Engineers and Technologists (Vols. I & II combined edition) Orient Longmans Rept.(2008).

**Reference:**

1. Dr. S. Sumant, Technical English I, Tata McGraw Hill, Chennai (2012).

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

SEMESTER – II**ENGINEERING MATHEMATICS - II**

(Common To All Branches)

L T P C

**12MA1202**

3 1 0 4

**Objective(s):** *On completion of the course, the students are expected*

- To familiarize with the applications of differential equations.
- To know the basics of vector calculus comprising of gradient, divergence, curl and line, surface & volume integrals along with classical theorems involving them.
- To understand the concept of analytic functions and conformal mappings.
- To grasp the basics of complex integration and the concept of contour integration which is important for evaluation of certain integrals encountered in practice.
- To study the Laplace transform techniques, then apply to solve second order linear differential equations with constant coefficients.

**UNIT – I ORDINARY DIFFERENTIAL EQUATIONS 12 Hrs**

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

**UNIT – II VECTOR CALCULUS 12 Hrs**

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

**UNIT – III ANALYTIC FUNCTIONS 12 Hrs**

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

**UNIT – IV COMPLEX INTEGRATION 12 Hrs**

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.

**UNIT – V LAPLACE TRANSFORMATION 12 Hrs**

Laplace transforms – Conditions for existence – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function and impulse functions – Initial and final value theorems - Transform of periodic functions.

Inverse Laplace transforms – Convolution theorem (excluding proof) – Solution of linear ordinary differential equations of second order with constant coefficients

**Text Book:**

L:45 T:15 Total Hours:60

1. Ravish R Singh and Mukul Bhatt, Engineering Mathematics - II, Third Edition, Mcgraw Hill Publications, New Delhi, (2012).

**References:**

1. B.S.Grewal, Higher Engineering Mathematics, Tata Mcgraw Hill Publishing Company, New Delhi, (2007).
2. Erwin Kreyszig, Advanced Engineering Mathematics, 7th Edition, Wiley India, (2007).
3. N.P.Bali and Manish Goyal, Text book of Engineering Mathematics I & II, Third edition, Laxmi Publications(p) Ltd.,(2008).



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – II****ENVIRONMENTAL SCIENCE AND ENGINEERING**

(Common To All Branches)

**12CY1204**

L T P C

**Objective(s):**

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- To make students understand the concepts of natural resources, ecosystem and biodiversity.
- To create awareness on pollution, value education, population growth and social issues.
- Students will be made aware of the concepts of the environment, its issues and possible solutions at the end of the semester.

**UNIT – I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES 09 Hrs**

Environment – definition, scope and importance, need for public awareness; Forest resources – use, over exploitation, deforestation, case studies, mining, dams and their effects on forests and tribal people; Water resources – use, over- utilization of surface and ground water, floods, drought, conflicts over water; Mineral resources – use, exploitation, environmental effects of extracting and using mineral resources and case studies; Food resources - world food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity and case studies; Land resources – land as a resource, land degradation, man induced landslides, soil erosion and desertification; Role of an individual in conservation of natural resources.

**UNIT – II ECOSYSTEMS AND BIODIVERSITY 09 Hrs**

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; Types of ecosystem – introduction, characteristic features, structure and function of the Forest ecosystem and Aquatic ecosystems; Biodiversity – introduction, definition of genetic, species and ecosystem diversity; Value of biodiversity; Hot-spots of biodiversity; Threats to biodiversity; Endangered and Endemic Species of India; Conservation of biodiversity – *In-situ* and *Ex-situ* conservation of biodiversity.

**UNIT – III ENVIRONMENTAL POLLUTION 09 Hrs**

Pollution – introduction and different types of pollution; Causes, effects and control measures of Air pollution, Water pollution – BOD and COD (definition and significance), DO and its determination by Winkler's method, Soil pollution and Noise pollution; Solid waste management – causes, effects and control measures of urban and industrial waste; Hazardous waste – nuclear and medical wastes.

**UNIT – IV SOCIAL ISSUES AND ENVIRONMENT 09 Hrs**

Urban problems related to energy; Water conservation – rain water harvesting and watershed management; Resettlement and rehabilitation of people – its problems and concerns; Environmental ethics – issues and possible solutions; Climate change – global warming and its effects on flora and fauna, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust; Wasteland reclamation; Consumerism and waste products; Environment Protection Act – Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act and Forest Conservation Act; Issues involved in enforcement of environmental legislation.

**UNIT – V HUMAN POPULATION AND ENVIRONMENT 09 Hrs**

Human population – population growth and variation among nations; Population explosion; Family welfare programme and family planning; Environment and human health; Human rights; Value education – HIV / AIDS ; Women and child welfare; Role of information technology in environment and human health; Sustainable development – from Unsustainable to Sustainable development – Green Chemistry.

**Total Hours: 45****Text Books:**

1. T. G. Jr. Miller, Environmental Science, Wadsworth Publishing Co. (2004).
2. Anubha Kaushik and C. P. Kaushik, *Environmental Science and Engineering*, New Age International Publishers, New Delhi (2006).

**References:**

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad, India (2004).
2. Benny Joseph, Environmental Science and Engineering, Tata McGraw-Hill (2006).
3. S.S.Dara , A Text Book of Environmental Chemistry and Pollution Control, S. Chand & Co., New Delhi (2006).
4. Raman Sivakumar, Introduction to Environmental Science and Engineering, Tata McGraw Hill Education Private Limited, New Delhi (2011).
5. W. P. Cunningham, Environmental Encyclopedia, Jaico Publishing House, Mumbai (2004).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – II**

**BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING**

(Common To AU, CE & ME)

<b>12EE2205</b>	L	T	P	C
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**Objective(s):**

- To study the basic concepts of electric circuits.
- To study the various measuring instruments and need for control system
- To familiarize the constructional details and operation of the electrical machines
- To study the characteristics of semiconductor devices and its application
- To study the simplification of mathematical expression, flip flops and converters

**UNIT – I ELECTRICAL CIRCUITS 12 Hrs**

Basic Definitions – Ohm’s Law – Kirchhoff’s Laws – Faraday’s Law – Lenz’s Law – Introduction to AC Circuits – Waveforms, Average and RMS Value – Power and Power factor – Three Phase Balanced Circuits: Star and Delta Connections.

**UNIT – II MEASURING INSTRUMENTS AND CONTROL SYSTEM 12 Hrs**

Basic Methods of Measurements: Direct and Indirect – Analog and Digital Instruments – Basic Principle of Indicating Instruments – Moving Coil and Moving Iron Ammeter and Voltmeter – Dynamometer type Wattmeter – Induction type Energy Meter – Cathode Ray Oscilloscope.  
Fundamentals of Control Systems: Basic Definitions – Open Loop Systems – Closed Loop Systems – Effect of Feed Back

**UNIT – III ELECTRICAL MACHINES 12 Hrs**

DC Generators: Construction – Operation – EMF Equation – Types -Applications. DC Motors: Operation – Types – Applications. Single Phase Transformer: Construction – Operation – EMF Equation – Applications, Single Phase Induction Motor: Construction – Operation – Split Phase Induction Motor and Capacitor Start Induction Run Motor – Applications, Three Phase Induction Motor : Types - Applications.

**UNIT – IV SEMICONDUCTOR DEVICES AND APPLICATIONS 12 Hrs**

Characteristics of PN Junction Diode – Avalanche and Zener break down – Zener diode – Zener diode Characteristics – Construction and Operation of Half wave and Full wave Rectifiers. Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Applications.

**UNIT – V DIGITAL ELECTRONICS 12 Hrs**

Logic Gates – Boolean Algebra – Boolean Laws – Half and Full Adders – RS and JK Flip-Flops –Registers – Asynchronous and Synchronous Counters – Digital to Analog converter: successive Approximation method – Analog to Digital Converter: Binary Weighted Resistor and R-2R ladder method.

L = 45 T = 15 Total Hours: 60

**Text Books:**

1. Smarajit Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI Learning Private Limited, Second Edition (2009).
2. V.Jegathesan, K.VinothKumar and R.Saravanakumar, Basic Electrical and Electronics Engineering, Wiley India,( 2011).

**References:**

1. R. Muthusubramanian,S. Salivahanan and K.A.Muraleedharan, Basic Electrical, Electronics and Computer Engineering,Tata McGraw Hill, Second Edition, (2006).
2. T.K .Nagsarkar and M.S.Sukhija, Basics of Electrical Engineering, Oxford press (2005).
3. V.K Mehta and Rohit Mehta, Principle of Electrical Engineering, S Chand & Company, (2008).
4. Mahmood Nahvi and Joseph A. Edminister, Electric Circuits, Schaum’ Outline Series, McGraw Hill (2002).



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – II****ENGINEERING GRAPHICS**

(Common To CS, EE, EC &amp; IT)

<b>12AU2205</b>	L	T	P	C
	1	3	0	4

**Objective(s):** To develop in student's graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

**CONCEPTS AND CONVENTIONS (Not for Examination)****1 Hr**

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

**UNIT – I CONSTRUCTION OF PLANE CURVES AND FREE HAND SKETCHING 15 Hrs****Curves Used In Engineering Practices:**

Conics - Construction of ellipse, Parabola and hyperbola by eccentricity method - Construction of cycloid - Construction of involutes of square and Circle - Drawing of tangents and normal to the above curves.

**Free Hand Sketching:**

Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

**UNIT – II PROJECTION OF POINTS, LINES AND PLANE SURFACES 15 Hrs**

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to both reference planes.

**UNIT – III PROJECTION OF SOLIDS AND SECTION OF SOLIDS 15 Hrs**

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.- Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other –Obtaining true shape of section.

**UNIT – IV DEVELOPMENT OF SURFACES 14 Hrs**

Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

**UNIT – V ISOMETRIC PROJECTIONS 15 Hrs**

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones.

**Total Hours: 75****Text Books:**

1. K. Venugopal and V. Prabhu Raja, Engineering Graphics, New Age International (P) Ltd. (2008).
2. K. V. Natrajan, Text book of Engineering Graphics, Dhanalakshmi Publishers, Chennai. (2006).

**References:**

1. N.D. Bhatt, Engineering Drawing, Charotar Publishing House, 46<sup>th</sup> Edition, (2003).
2. Dhananjay A.Jolhe, Engineering Drawing with an introduction to Auto CAD, Tata McGraw Hill Publishing Company Limited (2008).
3. M.S. Kumar, Engineering Graphics, D.D. Publications, (2007).
4. K. R. Gopalakrishnana, Engineering Drawing, (Vol.I & II), Subhas Publications (1998).



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – II****ADVANCED C PROGRAMMING**

		L	T	P	C
<b>12CS3206</b>	(For CS branch only)	4	0	0	4

**Objective(s):** To equip students with comprehensive knowledge of Advanced C programming Language so that they can develop programs on their own for various applications

**UNIT – I FUNDAMENTALS OF C PROGRAMMING 12 Hrs**

Overview of C Programming – Expressions: Variables – Type qualifiers – Storage class specifiers – Constants – Operators – Order of evaluation – Type conversion in expressions – Casts – Statements: Selection – Iteration – Jump – Block statements – Arrays and Strings

**UNIT – II FUNCTIONS, STRUCTURES AND UNIONS 12 Hrs**

Introduction – Functions: The general form of functions – Function arguments – The return statement – Recursion – Prototypes – The inline keyword – Structures – Definition – Initialization – Array of Structures – Passing Structures to Functions – Structure Pointers – Arrays and Structures within Structures – Structures and Functions – Union – Enumerations – Typedef

**UNIT – III POINTERS 12 Hrs**

Introduction – Fundamentals – Memory and Addresses – Address vs Contents – Indirection Operator – Null Pointer – Pointer Constants – Pointer Arithmetic – Array Pointer – Character String Pointer and Functions – Pointers and Functions – Pointers and Structures – Programs

**UNIT – IV PREPROCESSORS AND FILE MANIPULATION 12 Hrs**

Preprocessor and Multiple-file Compilation: C Preprocessor and the #include – #error – #undef – #line and #define – Conditional Compilation Directives – File System Basics: Program Organization and Multi-file Compilation – Command line arguments – File Input and Output – fread() and fwrite() – fseek() and Random Access- I/O – Standard Streams – Combining Command-line Arguments and File I/O – Dynamic Memory Allocation

**UNIT – V INTRODUCTION TO C++ 12 Hrs**

Introduction – Need for object oriented programming – Procedural Languages Vs Object oriented approach – Characteristics of Object oriented programming - C++ Programming Basics: Basic Program Construction – Output Using cout – Input with cin – Data types – Variables and Constants – Operators – Control Statements – Manipulators – Type conversion.

**Total Hours: 60****Text Books:**

1. Herbert Schildt, The Complete Reference C, Tata McGraw Hill, Fourth Edition, (2010)
2. Robert Lafore, Object Oriented Programming in C++, Galgotia Publication, (2009)

**References:**

1. K. Kenneth A. Reek, Pointers on C, Pearson Education, (2007).
2. Byron Gottfried, Programming with C, 2nd Edition, (Indian Adapted Edition), Tata McGraw Hill publications, (2006).
3. E. Balagurusamy, Computing fundamentals and C Programming, Tata McGraw-Hill Publishing Company Limited, (2008).
4. Stephen G. Kochan, Programming in C, Third Edition, Pearson Education India, (2005).
5. Ashok.N.Kamthane, Computer Programming, Pearson Education India, (2008).

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – II****ELECTRIC CIRCUIT ANALYSIS**

L T P C

**12EE3206**

(For EE branch only)

3 1 0 4

**Objective(s):**

- To analyze the direct current and alternating current linear electric circuits; laws and concepts that characterizes their behavior.
- To simplify the electrical circuits using various network reduction techniques, including network theorems.
- To study the circuit responses to sinusoidal source and Steady State response as a function of Frequency
- To study the transient response of the circuits subjected to step and sinusoidal excitations using Laplace transformations.
- To introduce the basic concepts of coupled and three phase circuits

**UNIT – I BASIC CIRCUITS CONCEPTS****12 Hrs**

Network Terminologies - Classification of Electrical Circuits - Energy Sources (independent and dependent), Circuit Elements (R, L and C), V-I Relationship of Circuit Elements, open circuit and short circuit, Ohm's Law and its limitations – Kirchhoffs laws - series and parallel combination of Circuit Elements - voltage and current division, source transformation, star and delta transformation

**UNIT – II SINUSOIDAL STEADY STATE ANALYSIS****12 Hrs**

Characteristics of sinusoids – phasor representation - concept of impedance and admittance, analysis of A.C. circuits. : Phasor diagram, impedance triangle, active power, reactive power, apparent power and power factor, power triangle. Series and parallel resonance circuits – Q factor, half-power frequencies, selectivity and bandwidth of resonant circuits - Comparison of Series and parallel resonance circuits.

**UNIT – III CIRCUIT ANALYSIS AND NETWORK THEOREMS****12 Hrs**

Mesh current and node voltage method of analysis for D.C and A.C. circuits - Thevenins Theorem - Norton Theorem – Superposition Theorem – Reciprocity Theorem - Maximum power transfer theorem for variable resistance load, variable impedance load and variable resistance and fixed reactance load

**UNIT – IV TRANSIENT ANALYSIS****12 Hrs**

Initial condition in circuit elements - Source free response of RL, RC and RLC circuits – forced (step and sinusoidal) response of RL, RC and RLC circuits using Laplace transform technique.

**UNIT – V COUPLED CIRCUITS AND THREE PHASE CIRCUITS****12 Hrs**

Coupled Circuits: self and mutual inductance – coefficient of coupling – modeling of coupled circuits - dot convention – analysis of simple coupled circuits.

Three phase circuits : Generation of three phase voltages – phase sequence – interconnection of three phase windings - analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads(balanced and unbalanced) – phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.

L: 45 T:15 Total Hours: 60

**Text Books:**

1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, Engineering Circuits Analysis, Tata McGraw Hill publishers, 6<sup>th</sup> edition, New Delhi, (2007).
2. Joseph A. Edminister, Mahmood Nahri, Electric circuits, Schaum's series, 4th edition, Tata McGraw-Hill, New Delhi (2007).

**References:**

1. K Chakrabarti A, Circuits Theory (Analysis and Synthesis), Dhanpath Rai & Sons, New Delhi, (1999).
2. Charles K. Alexander, Matthew N.O. Sadiku, Fundamentals of Electric Circuits, 4<sup>th</sup> Edition, McGraw-Hill Science Engineering, (2008).
3. Edward Hughes, Dr John Hiley, Electrical and Electronic Technology, Pearson education limited, tenth edition, (2008).
4. A.Sudhakar and S.P.Shyam Mohan, Circuits and Network Analysis and Synthesis, Tata McGraw Hill, (2007).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – II****ELECTRIC CIRCUIT THEORY****12EC3206**

(For EC branch only)

L	T	P	C
3	1	0	4

**Objective(s):** *The students are expected*

- *To understand Basic laws and theorems for electric circuits.*
- *To know the steady state and transient response of RLC circuits.*
- *To understand the basic concepts of coupled networks and three phase networks.*

**UNIT – I DC NETWORK ANALYSIS****12 Hrs**

Basic Components and Electric Networks, Charge, Current, Voltage and Power, Voltage and Current Sources, Ohms Law, Kirchoff's Laws, Analysis of Series and Parallel Networks, Voltage and Current Division, Networks Reduction, Nodal and Mesh Analysis for Linear Resistive Networks, An Introduction to Network Topology

**UNIT – II NETWORK THEOREMS AND DUALITY****12 Hrs**

Linearity and Non Linearity, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem, Tellegen's Theorem, Star - Delta Transformation. Duals, Dual Networks

**UNIT – III SINUSOIDAL STEADY STATE ANALYSIS****12 Hrs**

Sinusoidal Steady State analysis, Characteristics of Sinusoids, AC Network Power Analysis, Instantaneous Power, Average Power, Apparent Power and Power Factor. Phase Relationship for R, L, and C, Analysis of Simple Series and Parallel AC Networks with Phasor Diagram

**UNIT – IV TRANSIENTS AND RESONANCE IN RLC NETWORKS****12 Hrs**

Transient Response of RL, RC and RLC Networks for DC Input and Sinusoidal Inputs, Series and Parallel Resonance, Frequency Response, Quality Factor, Bandwidth, Half Power Frequencies.

**UNIT – V COUPLED NETWORKS AND THREE PHASE SYSTEMS****12 Hrs**

Magnetically Coupled Networks, Self Inductance, Mutual Inductance, Co-efficient of Coupling, Single and Double Tuned Networks, Analysis and Applications, Analysis of 3 Phase 3 Wire and 4 Wire Systems with Star and Delta Connected Loads (balanced & Unbalanced), 3 Phase Power Measurement by Two Watt Meter Method

L:45 T:15 Total Hours:60

**Text Books:**

1. Joseph A. Edminister, Mahmood Nahvi, Electric Circuits, Schaum's Series, 4th edition Tata McGraw-Hill, New Delhi, (2002).
2. David A. Bell, Electric Circuits, PHI, (2006)

**References:**

1. K. Jack E. Kemmerly, William Hart Hayt, Engineering Circuit Analysis-6th Edition, McGraw- Hill, New Delhi, (2002).
2. William H. Kayt, Jr. Jack E. Kemmerly, Steven M. Durbin, Engineering Network Analysis, 6th Edition, Tata McGraw-Hill Edition, (2006).
3. Charles K. Alexander & Mathew N.O. Sadiku, Fundamentals of Electric Networks, 2nd Edition, McGraw- Hill (2003).
4. A. Sudhakar and S.P. Shyam Mohan, Circuits and Network Analysis and Synthesis, Tata McGraw Hill, 3<sup>rd</sup> Edition (2007).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – II**

**PROGRAMMING AND DATA STRUCTURES**

<b>12IT3206</b>	(For IT branch only)	L	T	P	C
		4	0	0	4

**Objective(s):**

- Assess how the choice of data structures and algorithm design methods impacts the performance of programs.
- Choose the appropriate data structure and algorithm design method for a specified application using C.
- Solve problems using data structures such as linear and non-linear lists
- To understand memory management and file management concepts in C

**UNIT – I INTRODUCTION TO DATA STRUCTURES 12 Hrs**

Introduction to data structures – linear and Non Linear Data Structures – List – The List ADT – Singly linked list, Doubly Linked List , circular linked list– implementation – using array and linked list – Applications of list

**UNIT – II STACK AND QUEUES 12 Hrs**

Stack – Definitions and concepts – Operations on stacks- Stack implementation – using array, linked list – Applications of Stacks- Recursion – Conversion of expressions- Queues – Definitions- Queue implementations – Applications of Queues – Circular queue – Priority Queues

**UNIT – III STRING HANDLING FUNCTIONS 12 Hrs**

Strings Concepts – Declaring and initializing string variables - String input/output functions – Array of Strings – Storage Representation of Strings - String Manipulation functions –String / Data Conversion –String Applications

**UNIT – IV POINTERS 12 Hrs**

Pointers – Declaration - Accessing address of a variable- Initialization of pointer variable- Pointer to Pointer – Pointer Expressions - character strings, pointers to functions and structures –Array of pointers –Pointer to Functions –Passing Pointer as Arguments -Pointer to Structures – Dynamic Memory Allocation

**UNIT – V FILE MANAGEMENT 12 Hrs**

Introduction to File Concepts – File Structures – File Handling Functions- File Types –Streams – Text – Binary – The FILE pointer – Opening & Closing a file – Reading and writing from/to a file – File copying – Getting file name as Command line arguments – Preprocessors.

**Total Hours: 60**

**Text Books:**

1. R. F. Gilberg, B. A. Forouzan, Data Structures: A Pseudocode approach with C, Second Edition, Thomson India Edition ( 2005).
2. Pradip Dey , Ghosh Manas, Programming in C, Oxford University Press (2009).

**References:**

1. M. A. Weiss, Data Structures and Algorithm Analysis in C, Pearson Education Asia, (2002).
2. V. Aho, J. E. Hopcroft, and J. D. Ullman, Data Structures and Algorithms, Pearson Education, (1983).
3. Byron.S.Gottfried, Schaum’s Outline of Programming with C, 2<sup>nd</sup> Edition,(1996).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – II****PHYSICS AND CHEMISTRY LABORATORY**

(Common To All Branches)

L T P C

**12GE1210**

0 0 3 2

**Objective(s):** *To gain practical knowledge in the following experiments***LIST OF EXPERIMENTS PHYSICS LABORATORY:**

1. Determination of Young's modulus of the material of a uniform bar by non – uniform bending method.
2. Determination of Young's modulus of the material of a uniform bar by uniform bending method
3. Determination of Band gap energy of a semiconductor
4. Determination of Viscosity of liquid by Poiseuille's method.
5. Determination of rigidity modulus of a wire by torsional pendulum.
6. Determination of dispersive power of the given prism using spectrometer.

**LIST OF EXPERIMENTS CHEMISTRY LABORATORY:**

1. Conductometric Titration – Strong Acid vs. Strong Base
2. Conductometric Titration – Mixture of Weak and Strong Acids.
3. Conductometric Titration – Precipitation,  $\text{BaCl}_2$  vs.  $\text{Na}_2\text{SO}_4$
4. Estimation of Ferrous ion by Potentiometry –  $\text{Fe}^{2+}$  vs  $\text{K}_2\text{Cr}_2\text{O}_7$
5. Estimation of Hydrochloric Acid by pH metry.
6. Estimation of Iron by Spectrophotometry
7. Estimation of water of crystallization of Copper Sulphate.

**Total Hours: 45****Reference Books:**

1. Dr.G.Senthilkumar, Physics Lab manual, VRB Publications Pvt. Ltd.,(2006).
2. J.B. Yadav, Advanced Practical Physical Chemistry, GOEL Publishing House.
3. Gurdeep Raj, Advanced Practical Inorganic Chemistry, GOEL Publishing House.

**Note:**

A Minimum of FIVE experiments shall be offered.  
Laboratory classes on alternate weeks for Physics and Chemistry.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – II**

**COMPUTER PRACTICES LABORATORY - II**

(Common To All Branches)

**12CS1211**

L T P C  
0 0 3 2

**Objective(s):** *To gain practical knowledge in the following experiments.*

**LIST OF EXPERIMENTS**

**1. UNIX COMMANDS**

- Study of Unix Operating Systems
- Unix Commands
- Unix Editor
- Basic Shell Commands

**2. SHELL PROGRAMMING**

- Simple Shell Program
- Conditional Statements
- Testing and Loops

**3. C PROGRAMMING ON UNIX**

- Dynamic Storage Allocation
- Pointers
- Functions
- File Handling

Hardware / Software Requirements for a Batch of 30 Students

Hardware

- 1 UNIX Clone Server
- 33 Nodes (Thin Client or PCs)
- Printer – 3 Nos

Software

- Operating System – UNIX Clone (33 User License or License Free Linux)
- Compiler – C

**Total Hours: 45**



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – II****ENGINEERING PRACTICES LABORATORY**

(Common To AU &amp; ME)

L T P C

**12GE1212**

0 0 3 2

**Objective(s):** To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

**GROUP A (CIVIL & MECHANICAL)**

<b>Plumbing:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Study of Plumbing tools and accessories.</li> <li>b) Preparation of plumbing line sketches for water supply and sewage works.</li> <li>c) Hands-on-exercise - Basic pipe connections – Mixed pipe material connection.</li> </ul>	
<b>Carpentry:</b>	<b>5 Hrs</b>
<ul style="list-style-type: none"> <li>a) Study of Carpentry tools.</li> <li>b) Hands-on-exercise - Wood work, joints by sawing, planing and cutting.</li> </ul>	
<b>Welding:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Preparation of arc welding of butt joints, lap joints and tee joints.</li> <li>b) Gas welding practice.</li> </ul>	
<b>Basic Machining:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>c) Simple Turning and Taper turning.</li> <li>a) Drilling Practice.</li> </ul>	
<b>Sheet Metal Work:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Model making – Trays, funnel and Cone.</li> </ul>	
<b>Demonstration on:</b>	<b>4 Hrs</b>
<ul style="list-style-type: none"> <li>a) Smithy operations, upsetting, swaging, setting down and bending.</li> <li>b) Foundry operations like mould preparation for gear and step cone pulley.</li> <li>c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.</li> <li>d) Centrifugal pump and Window Air Conditioner.</li> </ul>	

**LIST OF EXPERIMENTS:**

1. Study of Carpentry tools, Welding tools, Sheet metal tools, Plumbing tools and Basic Machining tools.
2. To make a Tee joint from the given wooden piece.
3. To make a Lap joint/dovetail joint from the given wooden piece.
4. To make a butt joint using arc welding.
5. To make a Lap joint/Tee joint using arc welding.
6. To prepare a tray (square/rectangular) from the given tin sheet metal.
7. To prepare cone/funnel from the given tin sheet metal.
8. To prepare the mixed pipe (GI&PVC) connections for shower set from the main water supply.
9. To make a thread on given ( GI&PVC) pipe and prepare the connections for wash basin from the main water supply.
10. To make plain/step turning on a given MS rod by using Lathe.
11. Make drilling and tapping operation on a given MS plate by using drilling machine.
12. Demonstration – Draw a neat sketch and explain the working principle of
  - a) Smithy Operation
  - b) Mould Preparation
  - c) Square and Vee fitting Operation
  - d) Centrifugal Pump
  - e) Window Air Conditioner

(contd...)

**GROUP B (ELECTRICAL AND ELECTRONICS)**

**LIST OF EXPERIMENTS**

**ELECTRICAL ENGINEERING:**

**10 Hrs**

1. Residential House Wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent Lamp Wiring.
3. Stair-Case Wiring
4. Measurement of Electrical Quantities – Voltage, Current, Power & Power Factor in RLC circuit.
5. Measurement of Energy using Single Phase Energy Meter.
6. Study of Ceiling Fan, Iron Box and Emergency Lamp

**ELECTRONICS ENGINEERING:**

**10 Hrs**

1. Study of Electronic Components and Equipments – Resistor Colour Coding
2. Measurement of AC Signal Parameters (peak-peak, rms value, time period, frequency) using CRO.
3. Study of logic gates AND, OR, ExOR and NOT.
4. Soldering Practice – Components Devices and Circuits – Using general purpose PCB.
5. Construction of Half Wave and Full Wave Rectifier

Total Hours: 45

**References:**

1. K.Jeyachandran, S.Natarajan & S, Balasubramanian, A Primer on Engineering Practices laboratory, Anuradha Publications, (2007).
2. T.Jeyapoovan, M.Saravanapandian & S.Pranitha, Engineering Practices Lab Manual, Vikas Publishing House Pvt.Ltd, (2006).
3. H.S. Bawa, Workshop Practice, Tata McGraw – Hill Publishing Company Limited, (2007).
4. Rajendra Prasad & P.M.M.S. Sarma, Workshop Practice, Sree Sai Publication, (2002).
5. P.Kannaiah & K.L.Narayana, Manual on Workshop Practice, Scitech Publications, (1999).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – II****COMPUTER AIDED DRAWING LABORATORY**

(For CE branch only)

**12AU2212**

L	T	P	C
0	0	3	2

**Objective(s)** *To gain practical knowledge in the following experiments***LIST OF EXPERIMENTS**

1. Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a Title Block with necessary text and projection symbol.
3. Drawing of curves like parabola, spiral, involute using B spline or cubic spline
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning
5. Drawing front view, top view and side view of objects from the given pictorial views (eg. V-block, Base of a mixie, Simple stool, Objects with hole and curves).
6. Drawing of a plan of residential building ( Two bed rooms, kitchen, hall, etc.)
7. Drawing of a simple steel truss.
8. Drawing sectional views of prism, pyramid, cylinder, cone, etc,
9. Drawing isometric projection of simple objects
10. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model

**Note:**

Plotting of drawings must be made for each exercise and attached to the records written by students.

**Total Hours: 45**

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – II**

**ADVANCED C PROGRAMMING LABORATORY**

(For CS branch only)

**12CS3212**

L T P C  
0 0 3 2

Objective(s) *To gain practical knowledge in the following experiments*

**LIST OF EXPERIMENTS**

- I. C Programming with Arrays
  - a. One Dimensional and Two Dimensional array
  - b. Passing Two Dimensional array to function
  - c. Operations with array
- II. C Programming with Functions
  - a. Simple Library Functions
  - b. Recursive Function
  - c. User Defined Functions (Call by Value and Call by Reference)
- III. C Programming with Structures
  - a. Array of Structures
  - b. Structures within Structures
  - c. Passing structures to Functions
  - d. Unions
- IV. C Programming with Pointers
  - a. Pointer Arithmetic
  - b. Array of Pointers
  - c. Structure Pointers
  - d. Pointers to Functions
  - e. Pointers to Pointers
- V. C Programming with File Manipulations and Preprocessor
  - a. #include and #define Directives
  - b. Conditional Compilation Directives
  - c. Global Variables and Variable Storage Classes
  - d. Command line arguments
  - e. File Input and Output
  - f. Combining Command-line Arguments and File I/O

Note:

Out of 100,

- Part – A (from I - III) carries 50 Marks
- Part – B (from IV - V) carries 50 Marks

**Total Hours: 45**

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – II**

**ELECTRIC CIRCUITS ANALYSIS LABORATORY**

(For EE branch only)

**12EE3212**

L	T	P	C
0	0	3	2

**Objective(s)** *This course will provide students with hands-on experience in verification of circuit laws and theorems, measurement of circuit parameters, study of frequency response of resonant circuits, study of transient response and three phase circuits*

**LIST OF EXPERIMENTS**

1. Simulation and real time verification of Kirchhoff's Voltage and current laws.
2. Simulation and real time verification of Thevenin's and Norton's Theorem
3. Simulation and real time verification of Superposition Theorem
4. Simulation and real time verification of Maximum Power Transfer Theorem
5. Simulation and real time verification of Reciprocity Theorem
6. Simulation and real time verification of Mesh and Nodal Analysis
7. Simulation of Transient Response of RL and RC Circuits.
8. Simulation and real time frequency response of series and parallel resonant Circuits
9. Measurement of Self Inductance of a Coil.
10. Measurement of power and power factor of a balanced three phase load

**Total Hours: 45**

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – II**

**ELECTRIC CIRCUITS LABORATORY**

(For EC branch only)

L	T	P	C
0	0	3	2

**12EC3212**

**Objective(s)** *This course will provide students with hands-on experience in verification of circuit laws and theorems, measurement of circuit parameters, study of frequency response of resonant circuits, study of transient response and three phase circuits.*

**LIST OF EXPERIMENTS**

1. Verification of ohm's laws and Kirchoff's laws
2. Verification of Thevenin's and Norton's Theorem
3. Verification of superposition Theorem
4. Verification of maximum power transfer theorem
5. Verification of reciprocity theorem.
6. Measurement of self inductance of a coil.
7. Verification of mesh and nodal analysis.
8. Study of CRO and measurement of Voltage, frequency and Power factor for various inputs.
9. Transient response of RL and RC circuits for DC & AC inputs.
10. Frequency response of series and parallel resonance circuits
11. Study of frequency response of single tuned coupled circuits.

**Total Hours: 45**

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – II****PROGRAMMING AND DATA STRUCTURES LABORATORY**

(For IT branch only)

<b>12IT3212</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

**Objective(s):** *To gain practical knowledge in the following experiments***LIST OF EXPERIMENTS**

1. Write a program to perform the list operation using Array.
2. Program that uses the function to perform following operations on singly linked list
  - i. Creation
  - ii. Insertion ( at beginning , middle & End)
  - iii. Deletion
  - iv. Display
3. Program that uses the function to perform following operations on singly linked list
  - i. Creation
  - ii. Insertion ( at beginning , middle & End)
  - iii. Deletion
  - iv. Display
4. Program that implements stack and its operation using the arrays.
5. Program that implements stack and its operation using the linked list
6. Program that implements Queue and its operation using the arrays.
7. Program that implements Queue and its operation using the linked list
8. Program that uses the stack operations to Perform the following
  - i. Converting infix expression to postfix expression.
  - ii. Evaluating the postfix expression
9. Program that implements Circular Queue and its operation using the arrays.
10. Program that implements the string handling functions.
11. Program for dynamic memory allocation functions : Malloc , Calloc, and Free.
12. Program to prepare salary bill of a company using files
13. Program to merge two files
14. Program that implements the File handling functions

**Total Hours: 45**

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER –II**

**CARRER DEVELOPMENT SKILLS - II**

(Common To All Branches)

L T P C

**12HR1213**

0 2 0 1

**Objective(s):** *To make the students aware the need of Communication and expose them to the concepts of communication skills. Also, enable them to have creativity and problem solving skills.*

**UNIT – I COMMUNICATION SKILLS 04 Hrs**

Tools of Communication (Oral, Written, One Way, Two Way, Vertical and Horizontal / Lateral) – Assertive Communication – Introduction on Public Speech – (Activity on Written/Oral Communication).

**UNIT – II SELF INTRODUCTION 05 Hrs**

Introductory Greetings – Essentials of Self Introduction – Needs of Self Introduction (Activity on Self Introduction).

**UNIT – III PRESENTATION SKILLS 06 Hrs**

Preparing and Structuring the Presentation – Using Visual Aids – Voice Culture – Body Language and the Art of Presentation – Audience Awareness – Question and Interruption Handling – Building and Maintaining Interest – Dealing with the Unexpected – (Activity on Presentation Skills).

**UNIT – IV QUANTITATIVE APTITUDE 07 Hrs**

Speed Maths – HCF and LCM – Ratio and Proportions – Simplifications and Approximations – Number System.

**UNIT – V NON-VERBAL REASONING 08 Hrs**

Odd Man Out – Coding and Decoding – Mathematical Operations – Arithmetic Reasoning – Direction Sense Test.

**Total Hours: 30**

**Text Book(s):**

1. Jeff Butterfield, Soft Skills for Everyone, Cengage Learning India Pvt. Ltd., New Delhi- (2011).
2. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, 4th edition, TMH.

**Reference(s):**

1. Bhatnagar Nitin, Communicative English for Engineers and Professionals, ISBN 9788131732045, Pearson Publication, New Delhi (2010).
2. V.Sasikumar, P.Kiranmai Dutt & Geetha Rajeevan, Listening & Speaking, ISBN 9788175963344, Pearson Education, New Delhi (2007).
3. R.V.Praveen, Quantitative Aptitude and Reasoning, PHI
4. R.S.Agarwal, Quantitative Aptitude, 3rd Edition, TMH.



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – III**

		L	T	P	C
<b>12MA3301</b>	<b>DISCRETE AND ENGINEERING MATHEMATICS</b>	3	1	0	4

**Objective(s):** *The course objective is to develop the skills of the students in the areas of Engineering and Discrete Mathematics. This will be necessary for their effective studies in a large number of engineering subjects like Communication Systems, Electro-Optics and Electromagnetic Theory. Also the students would have knowledge of the concepts needed to test the logic of a program and identifying structures on many levels. The course will also serve as a prerequisite for post graduate and specialized studies and research.*

**UNIT – I      FOURIER SERIES      12 Hrs**

Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Parseval's identify – Harmonic Analysis.

**UNIT – II      FOURIER TRANSFORMS      12 Hrs**

Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity.

**UNIT - III      Z -TRANSFORMS AND DIFFERENCE EQUATIONS      12 Hrs**

Z-transforms - Elementary properties – Inverse Z-transform – Convolution theorem - Formation of difference equations – Solution of difference equations using Z-transform.

**UNIT – IV      MATHEMATICAL LOGIC      12 Hrs**

Propositional logic – Logical connectives - Truth tables – Normal forms (conjunctive and disjunctive) - Predicate logic – Universal and existential quantifiers - Proof techniques – direct and indirect – Proof by contradiction.

**UNIT – V      FUNDAMENTAL STRUCTURES      12 Hrs**

Set theory - Relationships between sets – Operations on sets – Set identities, Relations: Binary relations – Equivalence relations, Functions: Properties of functions – Composition of functions – Inverse functions – Permu

L:45 T:15 Total Hours: 60

**Text Books:**

1. Veerajan.T, "Transforms and Partial Differential Equations", 11th Reprint, TMH , Delhi
2. Tremblay J.P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 41th Re-print , 2012.

**References:**

1. Grewal, B.S, „Higher Engineering Mathematics' 42nd Edition, Khanna publishers, Delhi.
2. Kenneth H. Rosen, "Discrete Mathematics and its Applications", Sixth Edition, TMH.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – III**

<b>12EC2322</b>	<b>ELECTRIC CIRCUITS AND ELECTRON DEVICES</b>	L	T	P	C
	(Common To CS and IT)	3	1	0	4

**Objective(s):** *Make the Students to Understand**The concepts of Basic laws and theorems related to DC & AC Electric circuits.**The concept of RL, RC and RLC circuits and their responses.**The principle of operation and construction of semiconductor diodes, transistor and special semiconductor devices.***UNIT - I                      CIRCUIT ANALYSIS TECHNIQUES                      12 Hrs**

Kirchhoffs current and voltage laws – series and parallel connection of independent sources – resistors, inductors and capacitors in series and parallel combination – Network Theorems – Thevenin, Superposition, Norton, Maximum power transfer and duality – Star-delta conversion.

**UNIT - II                      A.C. CIRCUITS                      12 Hrs**

Generation of Alternating Voltage and Current – Sine Wave – Instantaneous, Peak, Average and RMS (Effective) values of sine waves – Form factor – Peak factor – Alternating current and voltage in a Pure resistance, Pure Inductance and Pure Capacitance circuits – Analysis of series combination of RL, RC and RLC circuits (Parameters to be considered: Impedance, Phasor diagram, Impedance Triangle, Instantaneous power, Average power, True power, Reactive power, Apparent power, Power Factor) – Analysis of parallel combination of RLC circuits.

**UNIT - III                      SEMICONDUCTOR DIODES                      12 Hrs**

Structure of semiconductor materials(Si and Ge) – covalent bond in semiconductor materials(Si and Ge) – energy band structure in insulators, semiconductors and conductors – Classification of semiconductors – Conductivity of N and P-type semiconductors – Mass-Action law – semiconductor parameters : intrinsic concentration ( $n_i$ ), Mobility( $\mu$ ), conductivity( $\sigma$ ) and energy gap(EG) – Drift and Diffusion currents – Operation and V-I characteristics of PN junction diode – space charge and diffusion capacitances – Energy band structure of an open circuited PN junction – diode current equation — effect of temperature on PN junction diode – Operation and V-I characteristics of zener diode – Breakdown mechanisms in zener diode :Avalanche Breakdown– zener Breakdown.

**UNIT - IV                      TRANSISTORS                      12 Hrs**

Constructional details of transistors – Types of transistors – transistor biasing – Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their input and output characteristics – Breakdown in transistors – Types of JFET– Constructional details of N-Channel and P-Channel JFET and their operation –Drain and Transfer characteristics of JFET– comparison of N-Channel and P-Channel JFET – Types of MOSFET : Enhancement and depletion types – Constructional details of MOSFET and their operation – Drain and Transfer characteristics of MOSFET – Comparison of BJT with MOSFET – thermal effect on MOSFET.

**UNIT - V                      SPECIAL SEMICONDUCTOR DEVICES                      12 Hrs****(Qualitative Treatment only)**

Constructional details, operation, applications and characteristics:Tunnel diode – PIN diode, varactor diode – SCR and its two transistor equivalent model – UJT – Diac and Triac – Laser, Photodiode, Phototransistor, Photoconductive and Photovoltaic cells – LED, LCD.

L:45 T:15 Total Hours: 60

**TEXT BOOKS:**

1. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5th Edition, 2008.
2. Joseph A. Edminister, Mahmood, Nahri, "Electric Circuits" – Shaum Series, TMH, 2001.

**REFERENCES:**

1. S. Salivahanan, N. Suresh kumar and A. Vallavanraj, "Electronic Devices and Circuits", 2nd Edition, 2008.
2. William H. Hayt, J.V. Jack, E. Kemmebly and steven M. Durbin, "Engineering Circuit Analysis", TMH, 6th Edition, 2002.
3. J. Millman & Halkins, Satyebranta Jit, "Electronic Devices & Circuits", TMH, 2nd Education, 2008.
4. David A.Bell, "Electric Circuits" – Prentice Hall of India Private Limited, Sixth Edition, 2003.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – III**

		L	T	P	C
<b>12EC2323</b>	<b>DIGITAL PRINCIPLES AND SYSTEM DESIGN</b>	3	0	0	3
	(Common to CS & IT)				

**Objective(s):** *The students are expected*

- To understand different methods used for the simplification of Boolean functions*
- To design and implement Combinational circuits*
- To design and implement Synchronous sequential circuits*
- To design and implement Asynchronous sequential circuits*
- To study the fundamentals of VHDL / Verilog HDL*

**UNIT - I                      BOOLEAN ALGEBRA AND LOGIC GATES                      09 Hrs**

Review of binary number systems - Binary arithmetic - Binary codes - Boolean algebra and theorems - Boolean functions - Simplifications of Boolean functions using Karnaugh map and Tabulation methods - Implementation of Boolean functions using logic gates.

**UNIT - II                      COMBINATIONAL LOGIC                      09 Hrs**

Combinational circuits - Analysis and design procedures - Circuits for arithmetic operations - Code conversion - Introduction to Hardware Description Language (HDL).

**UNIT - III                      DESIGN WITH MSI DEVICES                      09 Hrs**

Decoders and Encoders - Multiplexers and Demultiplexers - Memory and Programmable Logic Devices - HDL for Combinational circuits.

**UNIT - IV                      SYNCHRONOUS SEQUENTIAL LOGIC                      09 Hrs**

Latches and Flip-flops - Sequential circuits - Analysis and design procedures - State reduction and state assignment - Shift registers - Counters - HDL for Sequential Circuits - ASM Chart.

**UNIT - V                      ASYNCHRONOUS SEQUENTIAL LOGIC                      09 Hrs**

Analysis and design of Asynchronous sequential circuits - Reduction of state and flow tables – Race -free state assignment – Hazards.

**Total Hours: 45**

**Text Books :**

1. M. Morris Mano, "Digital Design", 4<sup>th</sup> Edition, Pearson Education, 2009.
2. Digital Fundamentals, by Thomas L. Floyd, Eighth Edition, PHI 2003.

**References :**

1. Charles H.Roth, "Fundamentals of Logic Design", 5<sup>th</sup> Edition Thomson Learning, 2011.
2. John.M Yarbrough, "Digital Logic Applications and Design", Thomson Learning, 2011.
3. Donald D.Givone, "Digital Principles and Design", TMH, 2011.
4. Donald P.Leach and Albert Paul Malvino, "Digital Principles and Applications", 7<sup>th</sup> Edition, TMH, 2011.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – III**

L T P C  
3 0 0 3

**12CS2304 COMPUTER ORGANIZATION AND ARCHITECTURE**  
(Common to CS & IT)

**Objective(s):** *To learn the basic structure of computers, basic processing unit, concepts of pipelining, memory system and I/O organization.*

**UNIT – I BASIC STRUCTURE OF COMPUTERS 09 Hrs**  
Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Instruction set architecture – Addressing modes – RISC – CISC – ALU Design – Fixed and Floating point operations.

**UNIT – II BASIC PROCESSING UNIT 09 Hrs**  
Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control – Nano programming.

**UNIT - III PIPELINING 09 Hrs**  
Basic concepts – Pipelining performance – Types of hazards- Data hazards – Instruction hazards (prediction) – Influence on instruction sets – Data path and control considerations – Performance considerations – superscalar operation.

**UNIT – IV MEMORY SYSTEM 09 Hrs**  
Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache Memories – Improving cache performance – Virtual memory – Memory management requirements – Secondary storage devices.

**UNIT – V I/O ORGANIZATION 09 Hrs**  
Accessing I/O devices – Programmed Input / Output – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

**Total Hours: 45**

**Text Books:**

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, Tata McGraw Hill, 2011.
2. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware / Software interface", Elsevier, 2012.

**References:**

1. John P. Hayes, "Computer Architecture and Organization", Third Edition, Tata McGraw Hill, 2012.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", Ninth Edition, Pearson Education, 2012.
3. M. Morris Mano, "Computer System Architecture", Third Edition, Pearson Education, 2007.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – III**

**12CS3305**

**C++ AND JAVA PROGRAMMING**

L T P C  
3 0 0 3

**Objective(s):** *To learn about basic concept of object oriented programming paradigm, to study in detail about C++ programming languages and Java, to distinguish the special features of oops from other structural languages, to write robust, maintainable, elegant and efficient C++ code and Java and to develop a component based coding using C++ and JAVA to meet the industrial application.*

**UNIT – I FUNDAMENTAL CONCEPTS OF OOPS**

**09 Hrs**

Object oriented programming concepts – Difference between object oriented and procedure oriented – Benefits – Applications – Introduction to C++– Data types-operators – classes – objects – default arguments – friend functions – Static member functions – static data members – Const member functions – pointers to member functions – local classes

**UNIT – II CONSTRUCTORS AND INHERITANCE**

**09 Hrs**

Constructors – default constructor – Parameterized constructors – Constructor with dynamic allocation – copy constructor – destructors – Inheritance – derived class – Types of Inheritance – Single inheritance – Multilevel inheritance – Multiple inheritance – Hierarchical and Hybrid inheritance – Virtual base classes – abstract class – Constructors in derived classes.

**UNIT - III POLYMORPHISM AND EXCEPTION HANDLING**

**09 Hrs**

Function overloading – Operator overloading – Unary operator overloading – Binary operator overloading – Rules for operator overloading –Type conversion – virtual functions – pure virtual function – Exception handling – Exception handling mechanism – try – catch– throw paradigm – managing console I/o operations.

**UNIT – IV JAVA BASICS**

**09 Hrs**

Introduction – Java features – Comparison with C and C++ – Java program structures – Java tokens – Java statements – Java virtual machine – Command line arguments - Constants – Variables – Data types – Scope of variables – Operators. Defining a class – Adding variables and methods – Creating objects – Accessing class members – Constructors – Method overloading – Static members – Inheritance: Extending a class – Overriding methods – Final variables and methods – Final classes – Abstract methods and classes – Visibility control.

**UNIT – V ARRAYS, STRING INTERFACES AND PACKAGES**

**09 Hrs**

Arrays – Creating an array – One dimensional array – Two-dimensional arrays – Strings – Vectors – Defining interfaces – Extending interfaces – Implementing interfaces – Accessing interface variables – Java API packages – Using system packages – Creating, accessing and using a package – Adding a class to a package – Basics of Applet.

**Total Hours: 45**

**Text Books:**

1. Herbert Schildt "The Complete Reference C++", Fourth Edition, Tata McGraw-Hill -2009.
2. D.Norton and H. Schildt, "Java 2 The Complete Reference", Fifth Edition, Tata McGraw-Hill 2009.

**References:**

1. B. Trivedi, "Programming with ANSI C++", Oxford University Press, 2007.
2. E.Balagurusamy, "Object Oriented Programming with C++", Fourth Edition, Tata McGraw-Hill 2009.
3. E.Balagurusamy, "Programming with Java a premier", Fourth Edition, Tata McGraw-Hill 2009.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – III**

<b>12CS3306</b>	<b>DATA STRUCTURES</b>	L	T	P	C
		3	0	0	3

**Objective(s):** *To learn the concepts of linear data structures and its applications, to understand the design and applications of non-linear data structures.*

**UNIT – I      LINEAR STRUCTURES      09 Hrs**

Abstract Data Types (ADT) – List ADT – array-based implementation – linked list implementation – cursor-based linked lists – doubly-linked lists – applications of lists – Stack ADT – Queue ADT – circular queue implementation – Applications of stacks and Queues.

**UNIT – II      TREE STRUCTURES      09 Hrs**

Tree ADT – tree traversals – left child right sibling data structures for general trees – Binary Tree ADT – expression trees – applications of trees – binary search tree ADT – Threaded Binary Trees.

**UNIT – III      BALANCED TREES      09 Hrs**

AVL Trees – Splay Trees – B-Tree – B+ Tree – heaps – binary heaps – applications of binary Heaps.

**UNIT – IV      SEARCHING AND SORTING      09 Hrs**

Linear and Binary Searching – Hashing – Separate chaining – open addressing – rehashing – extendible hashing – Sorting: insertion sort – merge sort – quick sort – heap sort.

**UNIT – V      GRAPHS      09 Hrs**

Topological sort – breadth-first traversal – shortest – path algorithms – minimum spanning tree – Prim's and Kruskal's algorithms – Depth-first traversal – bi-connectivity – Euler circuits – applications of graphs.

**Total Hours: 45****Text Books:**

1. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education, 2012.
2. V. Aho, J. E. Hopcroft, and J. D. Ullman, "Data Structures and Algorithms", Pearson Education, First Edition, Reprint 2003.

**References:**

1. R. F. Gilberg, B. A. Forouzan, "Data Structures", Second Edition, Thomson India, 2005.
2. Sartaj Sahni, "Data Structures, Algorithms and Applications in C++", Sartaj Publishers, 2<sup>nd</sup> Edition, Universities Press, 2005
3. Brijendra Kumar Joshi, "Data Structures and Algorithms in C", 1<sup>st</sup> Edition, Tata McGraw Hill, 2010
4. A.K. Sharma, "Data Structures using C", 1<sup>st</sup> Edition, Pearson Education, 2011.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – III**

		L	T	P	C
<b>12EC3310</b>	<b>ELECTRIC CIRCUITS AND ELECTRONIC DEVICES</b>	0	0	3	2

**LABORATORY**

**Objective(s):** *This course will provide students with hands-on experience in various Basic laws, theorems related to Electric circuits and characteristics of various semiconductor devices.*

**LIST OF EXPERIMENTS**

1. Verification of KVL and KCL
2. Verification of Thevenin and Norton Theorems
3. Verification of Superposition Theorem
4. Verification of Maximum power transfer Theorems
5. Frequency response of series and parallel resonance circuits
6. Characteristics of PN and Zener diodes
7. Characteristics of CE configuration
8. Characteristics of CB configuration
9. Characteristics of UJT and SCR
10. Characteristics of JFET and MOSFET
11. Characteristics of Diac and Triac

**Total Hours: 45**



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – III**

<b>12CS3311</b>	<b>C++ AND JAVA PROGRAMMING LABORATORY</b>	L	T	P	C
		0	0	3	2

**Objective(s):** *To develop a component based coding using C++ and JAVA to meet the industrial needs.*

**LIST OF EXPERIMENTS**

**C++ Programming:**

1. Static member, default argument and friend function
2. Constructors and Operator Overloading
3. Inheritance and its types
4. Virtual function
5. Exception handling

**Java Programming:**

6. Inheritance
7. Method overloading and method overriding
8. Interface
9. Applet
10. Database connectivity

**Total Hours: 45**

**List of Equipments and software required for a batch of 30 students**

1. PC – 30 nos.
2. Processor – Pentium IV with 2.0 GHz or higher
3. RAM – 256 MB or higher
4. Hard disk – 20 GB or higher
5. OS- Windows 2000/ Windows XP/ NT or LINUX
6. Software – Turbo C Version 3 or GCC Version 3.x., JDK 1.5 or Above, MS Access

**SEMESTER – III**

<b>12CS3312</b>	<b>DATA STRUCTURES LABORATORY</b>	L	T	P	C
		0	0	3	2

**Objective(s):** *To develop programming skills in design and implementation of data structures and their applications.*

**LIST OF EXPERIMENTS**

1. Singly and Doubly linked lists.
2. Polynomial Representation and Addition.
3. Infix to Postfix expression conversion using stack.
4. Queue and its operations.
5. Expression tree - preorder, inorder, and postorder traversals.
6. Binary search tree.
7. Insertion in AVL trees.
8. Priority queue using binary heaps.
9. Internal sorting (insertion sort and merge sort).
10. Prim's algorithm.

**Total Hours: 45**

**List of Equipments and software required for a batch of 30 students**

1. PC – 30 nos.
2. Processor – Pentium IV with 2.0 GHz or higher
3. RAM – 256 MB or higher
4. Hard disk – 20 GB or higher
5. OS- Windows 2000/ Windows XP/ NT or LINUX
6. Software – Turbo C Version 3 or GCC Version 3.x.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – III****12HR1313****CAREER DEVELOPMENT SKILLS – III**

(Common to all branches)

L T P C

0 2 0 1

**Objective(s):** *To improve reading, writing skills and personality development.  
To enhance arithmetical & logical ability.***UNIT – I READING AND WRITING****05 Hrs**Reading Comprehension and Essay Writing (*Activity on Reading & Writing*)**UNIT – II CREATIVE THINKING****05 Hrs**Motivation - Creativity – Innovation –Learning Creativity – Presence of Mind –Brainstorming – Strategies for Developing Creativity –Overcoming myths about creativity - **Activity (Extempore)****UNIT – III TIME MANAGEMENT AND GOAL SETTING****06 Hrs**Importance of time – Managing time – Time Wasters – The art of Prioritizing and Scheduling – **Activity** - Concept of goal-setting - Importance of goals - Dream Vs Goal – Reason for failure of Goals - SMART (Specific, Measurable, Achievable, Realistic, Time-bound) goals.**UNIT – IV QUANTITATIVE APTITUDE III****07 Hrs**

Chain Rule -Logarithms – Areas – Volumes - Partnerships and shares - Profit and loss.

**UNIT – V LOGICAL REASONING II****07 Hrs**

Alphabet test &amp; Series– Venn Diagrams-Series Completion -Number series.

**Total Hours: 30****References:**

1. R.V.Praveen, "Quantitative Aptitude and Reasoning", PHI 2nd Edition, 2013.
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations", 4<sup>th</sup> edition, TMH, 2011.
3. Jeff Butterfield, "Soft Skills for Everyone", Cengage Learning India pvt ltd, 2011, New Delhi.
4. R.S.Agarwal, "Quantitative Aptitude", 3rd edition, TMH, 2011.
5. Edgar Thorpe, "Test of reasoning", 4th edition, TMH, 2011.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – IV**

**12MA2401**

**NUMERICAL METHODS**

L	T	P	C
3	1	0	4

(Common To CE, CS, ME, AU & EE)

**Objective(s):** *On completion of the course, the students learn, to apply Numerical techniques in the field of engineering. They study the concept and applications of polynomial and transcendental equations, simultaneous linear equations, Eigen values, solutions to interpolation techniques, solutions to numerical differentiation and integration, Numerical solutions to ordinary differential equations and numerical solutions to boundary values problems.*

**UNIT – I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 12 Hrs**

Solutions to polynomial and transcendental equations - Newton's method, Regula falsi method – Solutions to simultaneous linear equations - Gaussian Elimination and Gauss-Jordon method– Iterative method - Gauss-Seidel method - Inverse of a matrix by Gauss Jordon method – Eigen value of a matrix by power method.

**UNIT – II INTERPOLATION AND APPROXIMATION 12 Hrs**

Newton's forward and backward difference interpolation techniques (equal interval) – Lagrange's interpolation and Divided difference method for solving unequal intervals – Interpolating with a cubic spline.

**UNIT - III NUMERICAL DIFFERENTIATION AND INTEGRATION 12 Hrs**

Numerical Differentiation using Newton's forward and backward interpolation methods only – Numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rules – Romberg's method – Double integrals using trapezoidal and Simpson's rules.

**UNIT – IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 12 Hrs**

Solving Ordinary Differential Equations by Taylor series method – Euler method and Modified Euler's Method for first order equation – Fourth order Runge – Kutta method for solving first and second order equations – Milne's and Adam's predictor and corrector methods.

**UNIT – V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS 12 Hrs**

Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

L:45 T:15 Total Hours: 60

**Text Books:**

1. Veerarajan, T and Ramachandran, T., "Numerical methods with programming in C", Second Edition, Tata McGraw-Hill Publishing.Co.Ltd, 2007.
2. Sankara Rao K, "Numerical Methods for Scientists and Engineers", 3<sup>rd</sup> Edition, Printice Hall of India Private Ltd, New Delhi, 2007

**References:**

1. Chapra, S. C and Canale, R. P., "Numerical Methods for engineers", 5<sup>th</sup> Edition, Tata McGraw-Hill, New Delhi, 2007.
2. Gerald, C. F. and Wheatley, P.O., "Applied Numerical Analysis", 6<sup>th</sup> Edition, Pearson Education, Asia, New Delhi, 2006.
3. Grewal, B.S. and Grewal, J.S., " Numerical methods in Engineering and Science", 6<sup>th</sup> Edition, Khanna Publishers, Delhi, 2004.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – IV**

<b>12CS3402</b>	<b>DATABASE MANAGEMENT SYSTEMS</b>	L	T	P	C
		3	0	0	3

**Objective(s):** *To learn and understand the various aspects of database management systems such as relational model, database design, transactions, implementation techniques and query processing.*

**UNIT – I BASIC CONCEPTS****09 Hrs**

Purpose of Database System – Views of data – Database Languages – Database System Architecture – Database users and Administrator – Data Models – Entity – Relationship model (E-R model) – E-R Diagrams.

**UNIT – II RELATIONAL MODEL****09 Hrs**

The relational Model: Structure of Relational Databases – Database Schema – Keys - Schema Diagrams – Relational Query Language: Introduction to SQL – Intermediate SQL – Advanced SQL – Accessing SQL from a programming Language – Functions and procedures – Triggers – Formal Relational Query Languages: The Relational Algebra – The Tuple Relational Calculus - The Domain Relational Calculus.

**UNIT – III DATABASE DESIGN****09 Hrs**

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 TRANSACTIONS****09 Hrs**

Transaction Concept – A Simple transaction Model – Transaction Atomicity and Durability – Transaction Isolation – Serializability – Transaction Isolation and Atomicity – Transaction Isolation Levels. Concurrency Control: Lock Based Protocols – Deadlock Handling – Timestamp-Based Protocols. Recovery Systems: Failure Classification – Recovery and Atomicity – Recovery Algorithm – Buffer Management – Storage Structure.

**UNIT – V IMPLEMENTATION TECHNIQUES AND QUERY PROCESSING****09 Hrs**

Indexing and Hashing: Ordered Indices – B tree Index Files – B+ tree Index Files – Static Hashing – Dynamic Hashing – Overview of Query Processing – Centralized and Client-Server Architectures.

**Total Hours: 45****Text Book:**

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Sixth Edition, Tata McGraw Hill, 2011.

**References:**

1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", Fourth Edition, Pearson / Addison wesley, 2007.
2. Raghu Ramakrishnan, "Database Management Systems", Third Edition, McGraw Hill, 2003.
3. S.K.Singh, "Database Systems Concepts, Design and Applications", First Edition, Pearson Education, 2006.
4. C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER IV**

<b>12IT2444</b>	<b>SOFTWARE ENGINEERING</b> (Common To CS, EC & IT)	<table border="0"> <tr> <td><b>L</b></td> <td><b>T</b></td> <td><b>P</b></td> <td><b>C</b></td> </tr> <tr> <td><b>3</b></td> <td><b>0</b></td> <td><b>0</b></td> <td><b>3</b></td> </tr> </table>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>							
<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>							

**Objective(s):** *This course introduces the concepts and methods required for the construction of large software intensive systems. It aims to develop a broad understanding of the discipline of software engineering. It seeks to complement this with a detailed knowledge of techniques for the analysis and design of complex software intensive systems. It aims to set these techniques in an appropriate engineering and management context. It provides a brief account of associated professional and legal issues.*

**UNIT I INTRODUCTION 09 Hrs**  
The Nature of software – Software Engineering – Software process – Software Engineering process – A Generic process model – Process Assessment and Improvement–Prescriptive Process models– Specialized process Model – Process Technology – Product and process – Agile Development.

**UNIT II REQUIREMENT ENGINEERING 09 Hrs**  
Requirement Engineering – Establishing Groundwork – Eliciting Requirements – Developing Use cases – Building the Requirements Model – Requirements Analysis – Requirements Modeling Strategies – Flow Oriented Modeling – Creating a Behavioral Model.

**UNIT III DESIGN CONCEPTS AND ARCHITECTURAL DESIGN 09 Hrs**  
Design within the Context of Software Engineering – Design process – Design concepts – Design model. Architectural design: Software architecture – Architectural Genres – Architectural styles – Architectural Design – Architecture Mapping using dataflow.

**UNIT IV TESTING TECHNIQUES 09 Hrs**  
A strategic Approach for Software testing – Test Strategies for conventional software – Validation Testing– System Testing – The Art of Debugging. Testing Conventional Applications: Software testing Fundamentals – Internal and External Views Testing – White Box Testing – Basis Path Testing – Control Structure Testing – Black Box Testing – Control Structure testing – Black Box Testing – Model Based testing – Testing for Specialized Environments – Architectures and Applications – Patterns for Software Testing.

**UNIT V QUALITY MANAGEMENT 09 Hrs**  
Quality Concepts: Software Quality –The Software Quality Dilemma – Achieving Software Quality. Formal Techniques Review – Software quality Assurance –Emerging Trends in Software Engineering.

**Total Hours: 45**

**Text Books:**

1. Roger. S. Pressman, "Software Engineering – A Practitioner's Approach", Seventh Edition, McGraw Hill International Edition, Singapore, 2010.
2. Ian Sommerville, "Software Engineering", Sixth Edition, Pearson Education, New Delhi, 2001.

**References:**

1. Jalote P., "An Integrated Approach to Software Engineering", Third edition, Narosa Publishers, New Delhi, 2005.
2. Ali Behforooz, Frederick J Hudson, "Software Engineering Fundamentals", Second edition, Oxford University Press, Noida, 2003.
3. Shari Lawrence Pfleeger, "Software Engineering Theory and Practice", Second Edition, Pearson Education, New Delhi, 2001.
4. Fairley R., "Software Engineering Concepts", Second edition, Tata McGraw Hill, New Delhi, 2003.

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**SEMESTER – IV**

<b>12CS2445</b>	<b>OPERATING SYSTEMS</b>	L	T	P	C
	(Common to CS, EC & IT)	3	0	0	3

**Objective(s):** *To learn and understand the various aspects of operating systems such as process management, memory management, and I/O management.*

**UNIT – I PROCESSES AND THREADS 09 Hrs**

Introduction to operating systems – operating system structures – system calls – system programs – system structure. Processes: Process concept – Process scheduling – Operations on processes – Cooperating processes – Inter-process communication – Communication in client-server systems. Case study: IPC in Linux. Threads: Multi-threading models – Threading issues.

**UNIT – II PROCESS SCHEDULING AND SYNCHRONIZATION 09 Hrs**

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

**UNIT – III STORAGE MANAGEMENT 09 Hrs**

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

**UNIT – IV FILE SYSTEMS 09 Hrs**

File-System Interface: File concept – Access methods – Directory structure – File system mounting – Protection. File-System Implementation: Directory implementation – Allocation methods – Free-space management – efficiency and performance – recovery – log-structured file systems. Case studies: File system in Linux – file system in Windows XP.

**UNIT – V I/O SYSTEMS 09 Hrs**

I/O Systems – I/O Hardware – Application I/O interface – kernel I/O subsystem – streams – performance. Mass-Storage Structure: Disk scheduling – Disk management – Swap-space management – RAID – disk attachment – stable storage – tertiary storage. Case study: I/O in Linux

**Total Hours: 45**

**Text Book:**

1. Silberschatz, Galvin, and Gagne, "Operating System Concepts", Sixth Edition, Wiley India Pvt Ltd, 2012.

**References:**

1. Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2009.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Pearson Education, 2007.
3. Harvey M. Deital, "Operating Systems", Third Edition, Pearson Education, 2004.



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**SEMESTER – IV**

<b>12CS3406</b>	<b>THEORY OF COMPUTATION</b>	L T P C 3 0 0 3
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**Objective(s):** *To provide students with an understanding of basic concepts in the theory of computation. This course will be able to construct finite state machines and the equivalent regular expressions, Equivalence of languages described by finite state machines and regular expressions, and to construct pushdown automata and the equivalent context free grammars, Equivalence of languages described by pushdown automata and context free grammars, Turing machines.*

**UNIT – I AUTOMATA 09 Hrs**  
 Mathematical preliminaries and notations – Central concepts of automata theory – Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.

**UNIT – II REGULAR EXPRESSIONS AND LANGUAGES 09 Hrs**  
 Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.

**UNIT – III CONTEXT-FREE GRAMMARS AND LANGUAGES 09 Hrs**  
 Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG – Deterministic Pushdown Automata.

**UNIT – IV PROPERTIES OF CONTEXT-FREE LANGUAGES 09 Hrs**  
 Normal Forms (CNF, GNF) for Context Free Grammars – Pumping lemma for CFL's- Closure properties of CFL – Decision Properties of CFL's.

**UNIT – V CHURCH-TURING THESIS 09 Hrs**  
 Turing machines – Variants of Turing Machines – Hilbert's problems – Decidability – Decidable languages – Halting problem.

**Total Hours: 45**

**Text Book:**

1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory, Languages and Computations", second Edition, Pearson Education, 2007.

**References:**

1. H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education, 2003.
2. Thomas A. Sudkamp, "An Introduction to the Theory of Computer Science, Languages and Machines", Third Edition, Pearson Education, 2007.
3. J. Martin, "Introduction to Languages and the Theory of computation" Third Edition, Tata Mc Graw Hill, 2007.
4. Raymond Greenlaw and H. James Hoover, "Fundamentals of Theory of Computation, Principles and Practice", Morgan Kaufmann Publishers, 1998.
5. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997

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**SEMESTER – IV**

L	T	P	C
0	0	3	2

**12EC2410      MICROPROCESSORS AND MICROCONTROLLERS**

**LABORATORY**

(Common to CS and IT)

**Objective(s):** *To implement the assembly language programming of 8085, 8086 and 8051.  
To study the system function calls like BIOS/DOS.  
To experiment the interface concepts of various peripheral device with processor and controller.*

**LIST OF EXPERIMENTS**

1. Programming with 8085.
2. Programming with 8086:  
Experiments Including BIOS/DOS Calls: Keyboard Control, Display, File Manipulation.
3. Interfacing 8085 with 8255/8253/8279/8251
4. Interfacing 8086 with 8255/8253/8279/8251
5. Programming with 8051.
6. 8051 Microcontroller based experiments for Control Applications.
7. Mini- Project.

**Total Hours: 45**

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**SEMESTER – IV**

<b>12CS2411</b>	<b>OPERATING SYSTEMS LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	(Common to CS & IT)	<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

**Objective(s):** *To enable students to understand and implement the following operating system concepts on LINUX or other UNIX like platform, using C for high level language implementation.*

**LIST OF EXPERIMENTS**

1. Write programs using the following System Calls of UNIX Operating System: fork, exec, getpid, exit, wait, close, stat, opendir, readdir.
2. Write programs using the I/O System Calls of UNIX Operating System (open, read, write, etc)
3. Write C programs to Simulate UNIX Commands
4. Given the list of Processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
5. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
6. Developing Application using Inter Process Communication (using Shared Memory, or Message Queues)
7. Implement the Producer – Consumer Problem using Semaphores (using UNIX system calls).
8. Implement some Memory Management schemes – I
9. Implement some Memory Management schemes – II
10. Implement any File Allocation Technique (Linked, Indexed or Contiguous).

**Total Hours: 45**

**List of Equipments and software required for a batch of 30 students**

1. PC – 30 nos.
2. Processor – Pentium IV with 2.0 GHz or higher
3. RAM – 256 MB or higher
4. Hard disk – 20 GB or higher
5. OS – LINUX : Ubuntu / OpenSUSE / Fedora / Red Hat / Debian / Mint OS

Note: A single server could be loaded with Linux and connected from the individual PCs.

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**SEMESTER – IV**

L T P C  
0 0 3 2

**12CS3412**

**DATABASE MANAGEMENT SYSTEMS LABORATORY**

**Objective(s):** *To develop programming skills in design and implementation of data structures and their applications.*

**LIST OF EXPERIMENTS**

1. DDL Commands with Constraints
2. DML and TCL Commands
3. Nested Queries & Join Queries
4. Views
5. High level programming language extensions (Control structures, Procedures and Functions)
6. Cursors
7. Triggers
8. Front end tools
9. Forms and Menu Design
10. Reports

**CONTENT BEYOND THE SYLLABUS**

1. Database Design and implementation (Mini Project)

**Total Hours: 45**

**List of Equipments and software required for a batch of 30 students**

1. PC – 30 nos.
2. Processor – Pentium IV with 2.0 GHz or higher
3. RAM – 256 MB or higher
4. Hard disk – 20 GB or higher
5. OS- Windows 2000/ Windows XP/ NT or LINUX
6. Software  
Front end : VB/VC ++/JAVA  
Back end: Oracle 11g, my SQL, DB2  
(Oracle server could be loaded and can be connected from individual PCs)

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**SEMESTER – IV**

<b>12HR1413</b>	<b>CAREER DEVELOPMENT SKILLS – IV</b>	L T P C
..... <b>U`VfUbW Ygk`</b>		0 2 0 1

**Objective(s):** *To inculcate people skills, time management and to enhance personality.  
To enhance arithmetical & analytical ability.*

**UNIT – I INTERPERSONAL SKILLS & SWOT ANALYSIS 04 Hrs**

Assertiveness – conflict – Conversation starters –Influence – Negotiation – Networking – Relationships –Teamwork – Trust - Introduction to SWOT Analysis – SWOT Worksheet **(Activity)**.

**UNIT – II STRESS MANAGEMENT 04 Hrs**

Introduction to Stress – What are Stressors –Stress Prevention –Coping Skills –Stress at Home/ Outside –Overcoming Monetary Stress and Unhealthy Worry –Dealing With Frustration and Anger.

**UNIT – III VOCABULARY PRACTICE 07 Hrs**

Synonyms – Antonyms – Confusing Words/Homonyms– Prepositions - Conjunctions – Jumbled Sentences/Words – **(Activity on all topics)**

**UNIT – IV QUANTITATIVE APTITUDE IV 09 Hrs**

Simple interest & Compound interest - Allegation & Mixtures - Time and Work & Pipes and cisterns-Heights and Distances.

**UNIT – V REASONING (VERBAL & NON VERBAL) 06 Hrs**

Blood Relations – Grammar (Tenses, Subject, and verb agreement) – Sentence formation and Correction.

**Total Hours: 30**

**References:**

1. R.V.Praveen, "Quantitative Aptitude and Reasoning", PHI 2nd Edition, 2013.
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations", 4<sup>th</sup> edition, TMH, 2011
3. Bhatnagar Nitin, "Communicative English for Engineers and Professionals", ISBN 9788131732045, Pearson Publication, New Delhi, 2010.
4. Jeff Butterfield, "Soft Skills for Everyone", Cengage Learning India pvt ltd, New Delhi, 2011.
5. R.S.Agarwal "Quantitative Aptitude", 3rd edition, TMH, 2011.
6. Edgar Thorpe, "Test of reasoning", 4th edition, TMH, 2011.

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**SEMESTER – V**

<b>12MA2501</b>	<b>PROBABILITY AND QUEUEING THEORY</b> (Common to CS & IT)	L	T	P	C
		3	1	0	4

**Objectives:**

- To provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of Science and Engineering.
- To gain the fundamental knowledge of the probability concepts and to acquire skills in analyzing queueing models.

**UNIT – I ONE DIMENSIONAL RANDOM VARIABLE 12 Hrs**

Discrete and Continuous Random Variables – Moments – Moment Generating Functions and their Properties – Standard Distributions: Binomial, Poisson, Uniform, Exponential and Normal Distribution.

**UNIT – II TWO DIMENSIONAL RANDOM VARIABLES 12 Hrs**

Joint Distributions – Marginal and Conditional Distributions – Covariance – Correlation and Regression – Central Limit Theorem (for Independent and Identically Distributed Random Variables).

**UNIT – III RANDOM PROCESSES 12 Hrs**

Classification – Stationary Process – Ergodic Process – Markov Process – Markov Chain – Transition Probabilities – Limiting Distributions – Poisson Process.

**UNIT – IV QUEUEING THEORY 12 Hrs**

Markovian Queues – Little's formula – Single Server Models : (M/M/1):(∞/FIFO) and (M/M/1):(N/FIFO) – Multi Server Models : (M/M/C):(∞/FIFO) and (M/M/C):(N/FIFO).

**UNIT – V NON-MARKOVIAN QUEUES AND QUEUEING NETWORKS 12 Hrs**

M/G/1 Queues : Single-Server Queues with Poisson Input and General Service – Pollaczek-Khintchin Formula – Series Queues : Open and Closed Jackson Networks.

**L: 45, T: 15, Total Hours: 60**

**Text Books:**

1. P. Kandasamy, K.Thilagavathi and K.Gunavathi, "Probability and Queueing Theory", S.Chand Publishers, 1<sup>st</sup> Edition Reprint, 2013.
2. M.B.K. Moorthy, K.Subramani and A. Santha, "Probability and Queueing Theory", Scitech Publishers, 3<sup>rd</sup> Edition, 2011.

**References:**

1. Oliver C. Ibe, "Fundamentals of Applied Probability and Random Processes", Elsevier, 1<sup>st</sup> Indian Reprint, 2012.
2. Hamdy A. Taha, "Operations Research", Pearson Education, 9<sup>th</sup> Edition, 2013

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – V**

<b>12IT2502</b>	<b>OBJECT ORIENTED ANALYSIS AND DESIGN</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objectives:**

- To understand the object oriented life cycle.
- To know how to identify objects, relationships, services and attributes through UML.
- To understand the UML diagrams.
- To know the Object Oriented Design process.
- To know about software quality and usability.

**UNIT – I INTRODUCTION 09 Hrs**

An Overview of Object Oriented Systems Development – Object Basics – Object Oriented Systems Development Life Cycle – The software development process – Building high quality software.

**UNIT – II OBJECT ORIENTED METHODOLOGIES AND MODELLING 09 Hrs**

Rumbaugh Methodology – Booch Methodology – Jacobson Methodology - Patterns – Frameworks – Unified Approach – Unified Modeling Language – Use case diagram – Class diagram - Interactive Diagram – Package Diagram – Collaboration Diagram – State Diagram – Activity diagram.

**UNIT – III OBJECT ORIENTED ANALYSIS 09 Hrs**

Identifying use cases – Use case model – Classification – Approaches for Identifying Classes: Noun Phrase Approach – Common Class Patterns Approach – Use case Driven approach – Classes, Responsibilities and Collaborators – Identifying Object Relationships, Attributes and Methods

**UNIT – IV OBJECT ORIENTED DESIGN 09 Hrs**

Object Oriented Design Axioms – Designing Classes – Redefining attributes – Designing methods and protocols – Access Layer – Object Storage and Object Interoperability.

**UNIT – V SOFTWARE QUALITY AND USABILITY 09 Hrs**

Designing Interface Objects - Software Quality Assurance - System usability - Measuring User Satisfaction.

**Total Hours: 45**

**Text Books:**

1. Ali Bahrami, "Object Oriented Systems Development", Tata McGraw-Hill, Ninth Reprint 2011.
2. Mahesh P.Matha, "Object – Oriented Analysis and Design Using UML", PHI, 2008.

**References:**

1. Martin Fowler, "UML Distilled", PHI/Pearson Education, Third Edition, 2004.
2. Stephen R. Schach, "Introduction to Object Oriented Analysis and Design", Tata McGraw-Hill, 2004.
3. Hans-Erik Eriksson, Magnus Penker, Brain Lyons and David Fado, "UML Toolkit", OMG Press Wiley Publishing Inc., 2004.
4. Timothy C. Lethbridge and Robert Laganriere, "Object Oriented Software Engineering", Tata McGraw-Hill, 2011.





## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – V**

<b>12CS3504</b>	<b>SYSTEM SOFTWARE AND COMPILER DESIGN</b>	L	T	P	C
		3	0	0	3

**Objectives:**

- To learn the design and implementation of assemblers, linkers and loaders.
- To study about the phases of compiler, lexical, parser, code generation, optimization techniques.

**UNIT – I ASSEMBLERS, LOADERS AND LINKERS 09 Hrs**

System software and machine architecture – Simplified Instructional Computer (SIC) – Basic assembler functions – Assembler algorithm and data structures – Basic loader functions – Design of an Absolute Loader – A Simple Bootstrap Loader – Algorithm and Data Structures for Linking Loader.

**UNIT – II COMPILER AND LEXICAL ANALYZER 09 Hrs**

Introduction to Compiler: Language processors-Structure of a Compiler – Cousins of compiler – Lexical Analysis: Role of the lexical analyzer – Specification and Recognition of tokens – Finite automata – Converting regular expression to automata – Optimization of DFA – based pattern matches.

**UNIT – III PARSERS 09 Hrs**

Syntax Analysis – role of syntax analysis – top down parsing – predictive parsing – bottom up parsing – Shift reduce parsing – Operator precedence parsing – LR parsers – Canonical collection of LR(0) Items – Constructing SLR parsing tables – LALR parser.

**UNIT – IV CODE GENERATION 09 Hrs**

Intermediate code: Intermediate Languages – Declarations - Backpatching – Code Generation: issues in the design of a code generator – basic blocks and flow graphs – A simple code generator – The dag representation of basic blocks.

**UNIT – V CODE OPTIMIZATION 09 Hrs**

Introduction – Principal sources of optimization – Peephole optimization – optimization of basic blocks – Loops in flow graphs – Global data flow analysis – Code improving transformations.

**Total Hours: 45****Text Books:**

1. Leland L. Beck, "System Software - An Introduction to Systems Programming", 3<sup>rd</sup> Edition, Pearson Education Asia, 2006.
2. Alfred V. Aho, Ravi Sethi and Jeffrey D. Ullman, "Compilers - Principles, Techniques and Tools", Pearson Education Asia, 2007.

**References:**

1. David Galles, "Modern Compiler Design", Pearson Education, 2007.
2. D. M. Dhamdhere, "Systems Programming and Operating Systems", 2<sup>nd</sup> Edition, Tata McGraw-Hill, 2000.
3. John J. Donovan, "Systems Programming", Tata McGraw-Hill, 46<sup>th</sup> Reprint, 2009.
4. John R. Levine, "Linkers & Loaders", Morgan Kaufmann Publishers, 2000.
5. Steven S. Muchnick, "Advanced Compiler Design & Implementation", Morgan Kaufmann Publishers, 2000.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – V**

<b>12CS3505</b>	<b>DESIGN AND ANALYSIS OF ALGORITHMS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objectives:**

- To develop problem solving skills.
- To learn different algorithmic design techniques.
- To analyze algorithms for space and time complexity.
- To get an overview of computational complexity.

**UNIT – I ANALYSIS OF ALGORITHM EFFICIENCY 09 Hrs**

Introduction-Fundamentals of Algorithms – Fundamental Data structures – Fundamentals of the Analysis of algorithm efficiency – Asymptotic Notation – Mathematical analysis of recursive and non-recursive Algorithms.

**UNIT – II ANALYSIS OF SORTING AND SEARCHING 09 Hrs**

Algorithm design techniques – Divide and conquer: Binary Search: Finding Maximum and Minimum – Merge sort, Quick Sort – Decrease and conquer: Insertion sort – Depth First Search and Breadth First Search – Transform and conquer: Presorting – Balanced search trees.

**UNIT – III ANALYSIS OF GRAPH ALGORITHMS 09 Hrs**

Dynamic Programming: Warshall's and Floyd's Algorithm – Optimal Binary Search trees - Knapsack Problem – Greedy Technique: Minimum Spanning Tree Algorithms – Dijkstra's Algorithm – Huffman trees.

**UNIT – IV BACKTRACKING & BRANCH AND BOUND TECHNIQUES 09 Hrs**

Backtracking: 8-Queens Problem – Hamiltonian Circuits – Sum of Subsets – Knapsack Problem – Branch and Bound Method: Knapsack Problem – Traveling Salesman Problem.

**UNIT – V NON-POLYNOMIAL PROBLEMS 09 Hrs**

Polynomial time – Nondeterministic Polynomial and NP-Complete problems – Reducibility and NP completeness – Approximation algorithms for NP hard problems: Nearest Neighbor – Minimum Spanning Tree.

**Total Hours: 45**

**Text Books:**

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", 2<sup>nd</sup> Edition, Pearson Education Asia, 2011.
2. Sara Baase and Allen Van Gelder, "Computer Algorithms – Introduction to Design and Analysis", Pearson Education Asia, 2010.

**References:**

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2001.
2. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education Asia, 2003.
3. Parag Himanshu Dave and Himanshu Balachadra Dave, "Design and Analysis of Algorithms", Pearson Education India, 2009.
4. Jon Kleinberg and Eva Tardos, "Algorithm Design" Pearson Education India, 2006.

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

SEMESTER – V

<b>12CS3506</b>	<b>MULTIMEDIA TECHNOLOGIES</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objective:**

- To learn multimedia technologies along with basic facts, Medias and animation.

**UNIT – I FUNDAMENTALS OF MULTIMEDIA 09 Hrs**

Multimedia: Introduction – Characteristics of Multimedia Presentation – Uses – Analog and Digital Representation – Digitization - Nyquist's Sampling Theorem - Quantization Error – Visual Display Systems.

**UNIT – II ELEMENTS OF MULTIMEDIA 09 Hrs**

Text: Types of Text – Unicode Standard – Text Compression and File Formats – Image Processing – Audio: Acoustics – Sound Waves – Types and Properties of Sounds – Psycho-Acoustics – Digital Audio Broadcasting – Video File Formats – Video Editing Concepts.

**UNIT – III MULTIMEDIA GRAPHICS 09 Hrs**

Graphics: Components of a Graphical System – 2D Coordinate Systems – 2D Transformations – Line-Drawing Algorithms – Circle-Drawing Algorithms – 2D Modeling – Curves and Splines – Splines as Polynomials – 3D Graphics – 3D Transformations – Projection – 3D Modeling – 3D Surface Characteristics and Lights.

**UNIT – IV MULTIMEDIA DATABASE AND COMPRESSION 09 Hrs**

Multimedia Database – Content-based Storage and Retrieval (CBSR) – Designing a basic Multimedia Database – Compression: Basic concept – Image Compression – Audio Compression – Video Compression.

**UNIT – V MULTIMEDIA DOCUMENTS AND APPLICATION DEVELOPMENT 09 Hrs**

Multimedia Documentation: Document and Document Architecture – Hypermedia Concepts – Hypermedia Design – Digital Copyrights – Digital Library – Multimedia Application Development: Software Life-Cycle Overview – ADDIE Model – Multimedia Production Steps.

**Total Hours: 45****Text Books:**

- Ranjan Parekh "Principles of Multimedia" Tata McGraw-Hill, 2<sup>nd</sup> Edition, 2013.
- Tay Vaughan, "Multimedia: Making It Work" Tata McGraw-Hill, 2012.

**References:**

- Deitel and Deitel "Internet & World Wide Web How to Program", 4<sup>th</sup> Edition – Prentice Hall, 2008.
- Banerji Ashok and Ghosh Ananda Mohan, Multimedia Technologies, TMH, New Delhi, 2010.
- Li, Ze-Nian and Drew-Mark S, "Fundamentals Of Multimedia," PHI Learning Private Limited, 2012.
- Randall Packer and Ken Jordan, "Multimedia: From Wagner to Virtual Reality", Norton Publishers, 2002.

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**SEMESTER – V**

**12CS2510**

**COMPUTER NETWORKS LABORATORY**  
(Common to CS & IT)

L	T	P	C
0	0	3	2

**Objectives:**

- *To gain knowledge about Switch/Hubs and error detection and Error correction.*
- *To learn practical knowledge about Sockets, Routing Protocols and RPC.*
- *To gain Knowledge about Simulator.*

**LIST OF EXPERIMENTS**

1. Study of Network topology configuration with hubs/ switches.
2. Program for implementing error detection and correction using hamming code.
3. Simulation of sliding window protocols.
4. Simulation of routing protocols (OSPF, BGP).
5. Programs using TCP Sockets (like date and time server & client, echo server & client).
6. Programs using UDP Sockets (like simple DNS).
7. Programs using UDP Sockets (echo server & client).
8. Programs using RPC.
9. Implementation of any two congestion control algorithms.
10. Experiments using NS2 simulator.

**Total Hours: 45**

**List of Equipments and Software required for a batch of 30 students**

1. SOFTWARE REQUIRED – JDK 1.7, Turbo C, NS2.35.
2. OPERATING SYSTEM – Windows / LINUX (FEDORA/UBUNDU/CENT OS).
3. COMPUTERS REQUIRED – 30 Nos. (Minimum Requirements: Pentium III or Pentium IV with 256 RAM and 40 GB Hard Disk).

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**SEMESTER – V**

<b>12CS3511</b>	<b>SYSTEM SOFTWARE AND COMPILER DESIGN LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

**Objective:**

- *To learn the functionalities of system software and compiler design.*

**LIST OF EXPERIMENTS**

1. Implementation of Assembler.
2. Implementation of Linker.
3. Implementation of Loader.
4. Implement a program for constructing NFA from a regular expression.
5. Implement a program for constructing predictive parsing table.
6. Implement a program to implement shift Reduce Parsing Algorithm.
7. Implement a program to implement Operator Precedence Parsing Algorithm.
8. Implement a program for constructing LR parsing table.
9. Implement front end of compiler that generates the three address code for the given language.
10. Implement back end of compiler which takes the three address code and produces the assembly language instructions.

**Total Hours: 45**

**List of Equipments and Software required for a batch of 30 students**

1. SOFTWARE REQUIRED – Turbo C.
2. OPERATING SYSTEM – Microsoft Windows XP.
3. COMPUTERS REQUIRED – 30 Nos. (Minimum Requirements: Pentium III or Pentium IV with 256 RAM and 40 GB Hard Disk).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – V**

**12CS3512**

**MULTIMEDIA LABORATORY**

L	T	P	C
0	0	3	2

**Objective:**

- *To learn the practical concepts of Multimedia technologies such as audio, video, image editing, animation and web designing.*

**LIST OF EXPERIMENTS**

1. Line and Circle drawing algorithms.
2. 2D transformations.
3. Video editing.
4. Audio editing.
5. Image editing.
6. 2D animation.
7. Web designing using HTML/PHP/Dreamweaver.

**Total Hours: 45**

**List of Equipments and Software required for a batch of 30 students**

1. SOFTWARE REQUIRED – Turbo C, Adobe Premier Pro, Sound forge, Adobe Photoshop, Flash 8, MySQL, PHP, Adobe Dreamweaver.
2. OPERATING SYSTEM – Microsoft Windows XP.
3. COMPUTERS REQUIRED – 30 Nos. (Minimum Requirements: Pentium III or Pentium IV with 256 RAM and 40 GB Hard Disk).

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – V**

<b>12 HR1513</b>	<b>CAREER DEVELOPMENT SKILLS – V</b> (Common to All Branches)	L	T	P	C
		0	2	0	1

**Objectives:**

- To inculcate the skills to build resumes, prepare for and take part in group discussions and interviews.
- To enhance arithmetical & logical ability.

**UNIT – I RESUME WRITING 05 Hrs**

Introduction to Resume Writing – Purpose – Types of Resumes – Resume Writing Strategies & Techniques – Tips & Techniques for Resume Formatting & Designing – The Power of Words, Structure & Positioning – Covering Letter Writing Strategies & Techniques. **(Activity: Preparation of Resume and Covering letter)**

**UNIT – II GROUP DISCUSSION 06 Hrs**

Concept – Methodology – Components – Role Players – How to Generate Ideas – Evaluation Techniques – Do's and Don'ts of GD. **(Activity: GD).**

**UNIT – III INTERVIEW SKILLS 04 Hrs**

Types of Interviews – Interpersonal Skills – Preparing for an Interview – Dress code for Interview – Overcoming Nervousness/Shyness – Body Language – Interview Tips – FAQs. **(Activity: Mock Interview).**

**UNIT – IV QUANTITATIVE APTITUDE V 09 Hrs**

Averages and ages – Time Speed and Distance – Problems on trains – Boats and streams – Clocks and calendars.

**UNIT – V NON-VERBAL REASONING V 06 Hrs**

Syllogisms – Analogies – Cubes and Dice – Seating arrangement.

**Total Hours: 30****References:**

1. Jeff Butterfield, "Soft Skills for Everyone", Cengage Learning India pvt. Ltd., 2011, New Delhi.
2. Hari Mohan Prasad & Rajinish Mohan, "How to Prepare for Group Discussion and Interview" Third Edition, TMH, 2012.
3. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations", 4th edition, TMH, 2011.
4. R.S. Agarwal, "Quantitative Aptitude", 3rd edition, TMH, 2011.
5. R.V. Praveen, "Quantitative Aptitude and Reasoning", 2nd Edition, PHI, 2013.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

<b>12HS3601</b>	<b>ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3

**Objective:**

- This course assists the students in learning the application of economic principles and policies on managerial decision making.

**UNIT – I INTRODUCTION 09 Hrs**

Managerial Economics – Relationship with other disciplines – Firms: Types, objectives and goals – Managerial decisions: Types and Process.

**UNIT – II DEMAND & SUPPLY ANALYSIS 09 Hrs**

Demand : Types of demand, Determinants of demand, Demand function, Demand elasticity and Demand forecasting – Supply: Determinants of supply , Supply function and Supply elasticity.

**UNIT – III PRODUCTION AND COST ANALYSIS 09 Hrs**

Production function: Returns to scale, Production optimization, Least cost input and Isoquants – Managerial uses of production function.

Cost Concepts: Cost function, Determinants of cost, Short run , Long run cost curves and Estimation of Cost

**UNIT – IV PRICING 09 Hrs**

Pricing : Meaning, Definition, Determinants of Price , Pricing under different objectives – Market Structures: Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly and Price discrimination Pricing methods in practice.

**UNIT – V FINANCIAL & CAPITAL (ELEMENTARY TREATMENT) 09 Hrs**

Balance sheet and related concepts – Profit & Loss Statement and related concepts – Financial Ratio Analysis Investments – Risks and return evaluation of investment decision – Average rate of return – Payback Period – Net Present Value – Internal rate of return.

**Total Hours: 45**

**Text Books:**

1. A. Ramachandra Aryasri and V. V. Ramana Murthy, “Engineering Economics and Financial Accounting”, 10<sup>th</sup> Reprint, Tata Mc-Graw Hill, 2012.
2. R.L. Varshney and K.L. Maheswari, “Managerial Economics”, 21<sup>st</sup> enlarged Edition Sultan Chand & Sons, 2012.

**References:**

1. A. Samuelson Paul and W.D. Nordhaus, “Economics”, 17<sup>th</sup> Edition, Tata McGraw-Hill, 2004.
2. McGuigan, Moyer and Harris, “Managerial Economics; Applications, Strategy and Tactics”, 10<sup>th</sup> Edition, Thomson South Western, 2005.
3. Paresh Shah, “Basic Financial Accounting for Management”, 4<sup>th</sup> Edition, Oxford University Press, 2007.
4. Nordhaus and Samuelson, “Economics”, 18<sup>th</sup> Edition, Tata McGraw-Hill, 2007.



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – VI**

<b>12CS2642</b>	<b>C# AND .NET FRAMEWORK</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objectives:**

- To learn the concepts of C# and .NET framework.
- With sample applications, the student will get experience through large-scale projects.

**UNIT – I BASIC CONCEPTS OF C# 09 Hrs**

Introduction and Overview – Literals – Variables – Data Types – Operators – Expressions – Branching – Looping – Methods – Arrays – Strings – Structures and Enumerations.

**UNIT – II OBJECT ORIENTED ASPECTS OF C# 09 Hrs**

Classes – Objects – Inheritance – Polymorphism - Interfaces – Operator Overloading – Delegates – Events – Errors and Exceptions.

**UNIT – III APPLICATION DEVELOPMENT ON .NET 09 Hrs**

Controls – Menus and Context Menus – Forms – Building Windows Applications – Relational Databases and SQL – ADO.Net Object Model – Getting Started with ADO.NET – ADO Managed Providers – Data – Bound Controls – Changing Database Records – ADO.NET and XML.

**UNIT – IV WEB BASED APPLICATION DEVELOPMENT ON .NET 09 Hrs**

Introduction to ASP. Net and Visual Studio – Creating ASP site – ASP.Net Controls – Validation Controls – Working with the Page (Basic & Advanced) – ADO.NET Data Provider – ADO.NET Data Containers – Data-Binding Model – Creating Bindable Grids of Data – ASP.NET Caching; Deploying ASP.NET Application – Programming Web Services.

**UNIT – V CLR AND .NET FRAMEWORK 09 Hrs**

Assemblies – Versioning – Attributes – Reflection – Viewing Metadata – Type Discovery – Reflecting on a Type – Marshaling – Remoting – Understanding Server Object Types – Specifying a Server with an Interface – Building a Server – Building a Client – Using Single Call – Threads.

**Total Hours: 45****Text Books:**

1. E. Balagurusamy, "Programming in C#", 3<sup>rd</sup> Edition, Tata McGraw-Hill, 2010.
2. J. Liberty, Ian Griffiths and Matthew Adams, "Programming C# 4.0", 6<sup>th</sup> Edition, O'Reilly, 2010.

**References:**

1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw-Hill, 2010.
2. Robinson Simon Robinson, K. Scott Allen, Ollie Cornes, Jay Glynn, Zach Greenvoss, Burton Harvey, Christian Nagel, Morgan Skinner and Karli Watson, "Professional C#", 2<sup>nd</sup> Edition, Wrox Press, 2004.
3. Andrew Troelsen, "Pro C# and the .NET Platform", Apress, 2010.
4. Art Gittleman, "Computing with C# and the .NET Framework", Jones & Bartlett Publishers, 2011.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

<b>12EC3623</b>	<b>WIRELESS COMMUNICATION NETWORKS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objectives:**

- To learn the fundamentals of wireless systems.
- To understand various medium access schemes.
- To acquire knowledge in Wireless LAN, WAN & HIPERLAN

**UNIT – I WIRELESS MEDIUM 09 Hrs**

Air Interface design – Radio propagation mechanism – Path loss modeling and signal coverage – Effects of multipath and doppler – Channel measurement and modeling – Simulation of radio channel.

**UNIT – II WIRELESS MEDIUM ACCESS 09 Hrs**

Fixed assignment access for voice networks: FDMA, TDMA, CDMA and its comparisons – Random access for data networks: Random access methods for mobile data services, Wireless LAN, Performance of random access methods – Integration of voice and data traffic: Access methods for integrated services, Data integration in voice oriented networks, Voice integrated into data oriented networks.

**UNIT – III WIRELESS NETWORK OPERATION 09 Hrs**

Wireless network topologies – Cellular topology – Cell fundamentals – Signal to interference ratio – Capacity expansion – Mobility management – Resources and power management – Security in wireless networks.

**UNIT – IV WIRELESS WAN 09 Hrs**

GSM and TDMA Technology – Mobile environment – Communication in the infrastructure – CDMA technology – IS-95 – IMT2000 – Mobile data networks – CDPD networks – GPRS – Mobile application protocol.

**UNIT – V WIRELESS LANS AND HIPERLANS 09 Hrs**

Introduction to wireless LANs – IEEE 802.11 – Principle and operation: WPAN IEEE 802.15, HIPERLAN I, II and HIPER ACCESS- Wireless home networking – Concepts of bluetooth technology – Wireless geolocation.

**Total Hours: 45**

**Text Books:**

1. Kaveh Pahlavan and Prashant Krishnamurthy, "Principles of Wireless Networks", PHI, 2013.
2. William Stallings, "Wireless Communications and Networks", 2<sup>nd</sup> Edition PHI, 2007.

**References:**

1. Leon Garcia and Widjaja, "Communication Networks", Tata McGraw-Hill, 2000.
2. Jon W Mark and Weihua Zhuang, "Wireless communication and Networking", PHI, 2003.
3. Andreas F Molisch, "Wireless Communication", John Wiley, 2006.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – VI**

<b>12CS3604</b>	<b>DISTRIBUTED COMPUTING</b>	L	T	P	C
		3	1	0	4

**Objectives:**

- To learn the communication, Process, Synchronization and Resource management in distributed environment.
- To learn fault tolerance, security and case studies in distributed system.

**UNIT – I COMMUNICATION IN DISTRIBUTED ENVIRONMENT 12 Hrs**

Introduction – Examples of Distributed systems – Resource sharing & web – Challenges – API for Internet protocols – External Data representation and marshalling – Remote procedure call – Communication between Distributed objects – Client server communication – Group communication.

**UNIT – II PROCESS AND SYNCHRONIZATION IN DISTRIBUTED SYSTEM 12 Hrs**

Processes – Threads – Communication and Invocation – Clocks, Events and Process states – Synchronizing physical clocks – Logical Time and Logical clocks – Global states – Distributed Mutual Exclusion – Elections – Distributed Transactions.

**UNIT – III DISTRIBUTED RESOURCE MANAGEMENT 12 Hrs**

Introduction – Data-Centric Consistency Models – Client-Centric Consistency Models – Distribution protocols – Consistency protocols – Casually Consistent Lazy Replication.

**UNIT – IV FAULT TOLERANCE AND SECURITY IN DISTRIBUTED SYSTEM 12 Hrs**

Fault Tolerant services – Atomic commit protocols – Concurrency control in Distributed Transactions – Distributed Deadlocks – Transaction recovery – Security: Threats and attacks – Access control – Cryptography – Cryptographic algorithms – Kerberos – Electronic payment system.

**UNIT – V CASE STUDIES 12 Hrs**

Distributed Object Based System – CORBA – COM+ – Distributed file system – Sun NFS – Andrew File system – Distributed Coordination Based System – JINI.

**L: 45, T:15, Total Hours: 60****Text Books:**

1. George colouris, Jean Dollimore and Tim Kinberg, "Distributed system concept and Design" Pearson Education, 4<sup>th</sup> Edition, 2012.
2. A.S. Tanenbaum, "Distributed Operating Systems", Pearson Education, 2011.

**References:**

1. Sunita Mahajan and Seema Shah, "Distributed Computing", Oxford Higher Education, 2010.
2. A.S. Tanenbaum and M. Van Steen, "Distributed Systems: Principles and Paradigm", Pearson Education, 2007.
3. Ajay D.Kshemkalyani and Mukesh Singhal, "Distributed Computing: Principles, Algorithms & Systems", Cambridge University press, 2010.
4. David Peleg, "Distributed Computing: A Locality-Sensitive Approach", SIAM, 2000.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

<b>12CS3605</b>	<b>PC HARDWARE, INSTALLATION, TROUBLESHOOTING AND SERVICING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objective:**

- To learn features, interfacing, configuration, troubleshooting and maintenance of the Computer Hardware, Motherboards, Processing Units, Memory, Storage, Power Supply, Monitors, Keyboard, Mouse, Printers, Scanners and Speakers.

**UNIT – I                      HARDWARE, DISASSEMBLING AND MOTHERBOARDS                      09 Hrs**

Computer through Generations – Basic Computer Hardware Structure – Hardware and Software – Different type of Computers – Features of Computer Systems: Features of Desktop System, Features of Server Computer, Features of Laptops, Features of Tablets – Disassembling Computers: Safety Information – Front Panel View – Rear Panel View – Internal Arrangements – Disassembling the Computer – Motherboards: Features – Components – Form Factor – Processor Support – Controller – Memory Support – Graphics Support – BIOS – IDE and SATA Connectors – Power Supply Connectors – External Devices Interfaces – Audio System – LAN System – Buses and Expansion Slots – Speaker and Battery – Front Panel Headers – System Board Jumpers and LED – I/O Addresses and Interrupts – Management Features – Selection of Motherboards – Using Modem Cards – Using Graphics Cards – External Interfaces and Connectors – Troubleshooting and Maintenance – common problems and solutions.

**UNIT – II                      PROCESSING UNIT, MEMORY, STORAGE & POWER SUPPLY                      09 Hrs**

Processor Features – Developmental Stages of CPU – Towards Multiple Core Processors – Processor Architectural Details – Processor Specifications – Installing And Uninstalling CPU – CPU Overheating Issues – Common Problems and Solutions – Graphical Processing Units – Memory: Features – Types – Working – Memory Map – Installing and Uninstalling Memory Modules – Maintenance and Troubleshooting – Common Problems and Solutions – Storage: Storage Devices – Hard Disks Details – Working – Feature – Installation – Selection – Specifications – Partitioning and Formatting – Maintenance And Troubleshooting – Common Problems and Solutions – Solid State Drives – Installation – Optical Storage Devices Features – Working of Optical Storage Drives – Installing Optical Drives – Specification for Multi Drives – Disc Burning Software – Troubleshooting and Maintenance – Common Problems and Solutions – Blue Ray Discs – External Storage Devices – Power Supply – Power Supply and UPS: Computer power supply units – Features – Types – Installing SMPS – specification – maintenance and troubleshooting – selecting SMPS and computer cabinets – UPS: uninterrupted power supply – working – types – front and rear panels – UPS features and specification – UPS batteries – tips on battery care – common problems and solutions.

**UNIT – III                      PERIPHERALS ASSEMBLING AND CONFIGURING COMPUTER                      09 Hrs**

Features of monitor – CRT monitors – Working – Specification – Setting up – Troubleshooting and maintenance – common problems and solutions – LCD monitors – installing – specification – specification for TFT monitors – maintenance and troubleshooting of LCD monitors – common problems and solutions – LED monitors and touch screens – Keyboard: Types and features – Interfaces – Installing – usage guidelines – Maintenance and troubleshooting – common problems and solutions – Mouse: types – Working – Features – interfaces – Maintenance and troubleshooting – common problems and solutions – Assembling and Configuring: Caution and safety – Setting up the cabinet – Installing power supply unit – Installing CPU – Installing heat sink and cooling fan – Installing memory module – Mounting motherboard – Installing hard disk – Installing optical drive – Connecting motherboard power supply cables – Connecting to front panel – Connecting mouse, keyboard and monitor – Switching on the computer – Configuring BIOS – Installing operating system – Installing device drivers – Installing add-on cards – common problems and solutions.

(Cont...)

**UNIT – IV                      TROUBLESHOOTING AND MAINTENANCE                      09 Hrs**

Safety Precautions – Configuring using BIOS Parameters – Power on Self Test – Devices and Drivers – Working with Windows Registry – Performance improving steps – Over clocking the system – Diagnosing general problems – common – problems and solutions – Preventive maintenance – Replacing CMOS battery – Clearing BIOS password – Flashing BIOS – Advice from the expert – Laptops: Features – Using laptops – Replacing laptop batteries – Dismantling laptops – Replacing hard disk drive – Replacing memory – Replacing optical drive – common problems and solutions – Troubleshooting and maintenance.

**UNIT – V                      PRINTERS, SCANNERS AND SPEAKERS                      09 Hrs**

Printers: Types – Dot matrix printers – specifications – Installing – Maintenance and troubleshooting – common – problems and solutions – Inkjet printers: specification – Installing – Troubleshooting and maintenance – common problems and solutions – Laser printer: features – Working – specifications – Installing – Installing printer on networks – Managing laser printers – Maintenance and Troubleshooting – common problems and solutions – Multifunction devices (MFDs) – specifications – Installing MFD – Maintenance and Troubleshooting – common problems and solutions – Scanners: Features – Components – Specifications – Working – Installing – Scanning pictures and documents – Maintenance of scanner – common problems and solutions – Speakers: Computer speakers – Working – specifications – Adding speakers – Adding audio cards – common problems and solutions.

**Total Hours: 45**

**Text Books:**

1. L. L. James, "Computer Hardware: Installation, Interfacing, Troubleshooting and Maintenance", PHI Learning, 2013.
2. B. Govindarajalu, "IBM PC and Clones – Hardware, Troubleshooting and Maintenance", Tata McGraw-Hill, 2008.

**References:**

1. Jean Andrews, "Guide to Hardware Managing, Maintaining and Troubleshooting", Cengage Learning (Course Technology), 5<sup>th</sup> Edition, 2010.
2. Craig Zacker and John Rourke, "PC Hardware: The Complete Reference", McGraw-Hill, 2001.
3. Michael W. Graves and "A+ Guide to PC Hardware Maintenance and Repair", Volume 1, Cengage Learning, 2004
4. Scott M. Mueller, "Upgrading and Repairing PCs", Que Publishing, 2011.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

**12CS3610**

**C# AND .NET LABORATORY**

L	T	P	C
0	0	3	2

**Objectives:**

- *To learn programming in C#.*
- *To develop windows forms, Windows applications and Web services.*

**LIST OF EXPERIMENTS**

1. Programs to implement the use of Objects.
2. Programs to implement multithreading.
3. Programs to implements String handling.
4. Programs to implement file handling.
5. Programs to implement Delegates and Event handling.
6. Using ADO.Net to handle data, connecting to a database, firing queries to display data.
7. Developing windows forms.
8. Using various controls on Windows forms.
9. Create web page using session concepts.
10. Create web pages for Shopping Cart.
11. Create web pages for Airline reservation.

**Total Hours: 45**

**List of Equipments and Software required for a batch of 30 students**

1. SOFTWARE REQUIRED – Microsoft Visual Studio 2005, Microsoft SQL 2005.
2. OPERATING SYSTEM – Windows (XP/7/8).
3. COMPUTERS REQUIRED – 30 Nos. (Minimum Requirements: Pentium III or Pentium IV with 256 RAM and 40 GB Hard Disk).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

<b>12CS3611</b>	<b>CASE TOOLS LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

**Objective:**

- *Solving Simple problems using CASE tools for Planning, designing, cost estimation, Modeling the requirements and configuration management.*

**LIST OF EXPERIMENTS**

1. Payroll system (pay slip generation, deduction and net pay report generation).
2. On line shopping (Web based).
3. Banking system (with debit and credit ledger report creation).
4. Text editor.
5. Online voting system.
6. Library automation system.

**Total Hours: 45**

**List of Equipments and Software required for a batch of 30 students**

1. SOFTWARE REQUIRED – Rational Rose, Visual Basic, Net beans IDE, SQL, Oracle.
2. OPERATING SYSTEM – Windows XP/2007.
3. COMPUTERS REQUIRED – 30 Nos. (Minimum Requirements: Pentium III or Pentium IV with 1GB RAM and 60 GB HDD).

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

<b>12CS3612</b>	<b>OPEN SOURCE SOFTWARE LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

**Objectives:**

- *To learn practical knowledge about the open source software – MySQL, PHP, PHYTON and PERL*
- *To gain Knowledge about Simulator.*

**LIST OF EXPERIMENTS**

1. Installation of LINUX in different modes (user mode, GUI, Single user and Server ).
2. Installing Samba Server and sharing files to windows and Common UNIX Printing System (CUPS).
3. MySQL installation.
4. Apache installation.
5. GUI programming: Simple programs using GTK or QT.
6. PHP with Database connectivity.
7. Simple PHYTON programs.
8. Python programs with Database connectivity.
9. Text processing with PERL: simple programs, connecting with database.
10. Simple TCL scripts.

**Total Hours: 45**

**List of Equipments and Software required for a batch of 30 students**

1. SOFTWARE REQUIRED – MySQL, PHP, PHYTON, PERL.
2. OPERATING SYSTEM – LINUX (FEDORA/UBUNDU/CENT OS).
3. COMPUTERS REQUIRED – 30 Nos. (Minimum Requirements: Pentium III or Pentium IV with 256 RAM and 40 GB Hard Disk).



## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VI**

12CS3613

COMPREHENSION

L	T	P	C
0	2	0	1

**Objectives:**

- To provide overview of all Computer Science and engineering topics covered in I and V semesters.
- To assess the overall knowledge level of Computer Science and engineering standards and guide them to take corrective measures where deficiencies are detected.

Mode of Assessment	Topics / Area	Test Duration	Max. Marks
Internal Test – 1	<ul style="list-style-type: none"> <li>• Fundamentals of Computing and Programming.</li> <li>• Advanced C Programming.</li> </ul>	1 Hour 30 Minutes	30
Internal Test – 2	<ul style="list-style-type: none"> <li>• C++ and Java Programming.</li> <li>• Data Structures.</li> <li>• Database Management Systems</li> </ul>	1 Hour 30 Minutes	30
Internal Test – 3	<ul style="list-style-type: none"> <li>• Operating Systems.</li> <li>• Computer Networks.</li> <li>• Design and Analysis of Algorithms.</li> </ul>	2 Hours	40
<b>Total Marks</b>			100

**Total Hours: 30****References:**

1. "Gate 2014: Computer Science and Information Technology", G.K. Publishers, 2014.
2. "A Complete Guide to the Gate: Computer Science Engineering", Pearson, 2013.
3. Ashok N Kamthane, "Computer Programming", Pearson Education, 2008.
4. Herbert Schildt, "The Complete Reference C", 4<sup>th</sup> Edition, Tata McGraw-Hill, 2010.
5. Robert Lafore, "Object Oriented Programming in C++", Galgotia Publication, 2009.
6. E. Balgurusamy, "Object Oriented Programming with C++", 4<sup>th</sup> Edition, Tata McGraw-Hill, 2009.
7. E. Balgurusamy, "Programming with Java a premier", 4<sup>th</sup> Edition, Tata McGraw-Hill, 2009.
8. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2<sup>nd</sup> Edition, Pearson Education, 2005.
9. Abraham Silberschatz, Henry F. Korth and S. Sudharshan, "Database System Concepts", 6<sup>th</sup> Edition, Tata McGraw-Hill, 2011.
10. Silberschatz, Galvin, and Gagne, "Operating System Concepts", 6<sup>th</sup> Edition, Wiley India Pvt Ltd, 2012.
11. Behrouz A. Forouzan, "Data Communications and Networks", 5<sup>th</sup> Edition, Tata McGraw Hill Publication, 2013.
12. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", 2<sup>nd</sup> Edition, Pearson Education Asia, 2011.



## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VII**

<b>12CS3702</b>	<b>CRYPTOGRAPHY AND NETWORK SECURITY</b>	L	T	P	C
		3	0	0	3

**Objective:**

- To understand the role of mathematics in cryptographic techniques, security services & linkages of Network layers and Current developments of security in real time applications.

**UNIT – I                   BASICS OF CRYPTOGRAPHY AND NETWORK SECURITY                   09 Hrs**

Introduction – Motivating examples – Security goals – OSI Security architecture: Security attacks - Security services – Security mechanisms assurances – Model of Network Security.

**UNIT – II                   SYMMETRIC CIPHERS                   09 Hrs**

Traditional Symmetric ciphers – Substitution ciphers – Transposition ciphers – Stream and Block ciphers – Modern Symmetric key ciphers – Modern Block and Stream ciphers – Data Encryption Standard – DES analysis – Structures – Multiple DES – Advanced data Encryption Standard – Transformation – Key Expansion – Analysis.

**UNIT – III                   ASYMMETRIC CIPHERS                   09 Hrs**

Mathematics of Cryptography – Primarily testing – Factorization – Chinese Remainder Theorem – Quadratic congruence – Exponentiation and Logarithm – RSA cryptosystem – Rabin cryptosystem – Elgamal cryptosystem – Elliptic cryptosystem.

**UNIT – IV                   MESSAGE INTEGRITY AND AUTHENTICATION                   09 Hrs**

Message integrity and authentication: Cryptographic hash functions – Digital signature – Key Management – Symmetric & Asymmetric key distribution – Kerberos – Hijacking.

**UNIT – V                   SYSTEM SECURITY                   09 Hrs**

Security Description – Users, trust and trusted systems – Malicious programs – Worms – Viruses – Intrusion Detection Systems – Firewalls: definitions, construction and working principles.

**Total Hours: 45****Text Books:**

- Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw-Hill, 2007.
- William Stallings, "Cryptography and Network security", Pearson Education, 2007.

**References:**

- Atul Kahate, "Cryptography and Network security", 2<sup>nd</sup> Edition, Tata McGraw-Hill, 2009.
- Wade Trappe and Lawrence C Washington, "Introduction to Cryptography with coding theory", 2<sup>nd</sup> Edition, Pearson Education, 2007.
- Roberta Bragg and Mark Phodes Ousley, "Network Security: The Complete Reference", Tata McGraw-Hill, 2008.
- Forouzan, "Cryptography and Network Security (Sie)", Tata McGraw-Hill, 2011.



## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VII**

<b>12CS3704</b>	<b>MOBILE AND PERVASIVE COMPUTING</b>	L	T	P	C
		3	0	0	3

**Objective:**

- To learn mobile network architecture & layers and pervasive computing.

**UNIT – I TELECOMMUNICATION NETWORKS 09 Hrs**

Cellular Wireless Networks – GSM: Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security – GPRS.

**UNIT – II MOBILE NETWORK LAYER 09 Hrs**

Mobile IP – DHCP – Mobile Adhoc Networks – Proactive and Reactive Routing Protocols – Multicast Routing.

**UNIT – III TRANSPORT AND APPLICATION LAYERS 09 Hrs**

Mobile TCP– WAP Architecture – WWW Programming Model – WDP – WTLS – WTP – WSP – WAE – WTA Architecture – WML – WML Scripts.

**UNIT – IV PERVASIVE COMPUTING 09 Hrs**

Pervasive computing infrastructure – applications – Device Technology – Hardware, Human- Machine Interfaces, Biometrics and Operating systems – Device Connectivity – Protocols, Security and Device Management – Pervasive Web Application architecture – Access from PCs and PDAs – Access via WAP.

**UNIT – V SERVER SIDE PROGRAMMING IN JAVA 09 Hrs**

VIEW – Servlets – Enterprise Java Beans – Java Server Pages – XML – Web Services – Pervasive Web Applications Architecture: Scalability and Availability – Architecture.

**Total Hours: 45****Text Books:**

- Jochen Schiller, "Mobile Communications", 2<sup>nd</sup> Edition, Prentice Hall India, 2009.
- Jochen Burkhardt, "Pervasive Computing: Technology and Architecture of Mobile Internet Applications", 3<sup>rd</sup> Edition, Addison-Wesley, 2012.

**References:**

- Frank Adelstein, Sandeep KS Gupta and Golden Richard, "Fundamentals of Mobile and Pervasive Computing", Tata McGraw-Hill, 2005.
- Debashis Saha, "Networking Infrastructure for Pervasive Computing: Enabling Technologies", 1<sup>st</sup> Edition, Springer, 2002.
- Agrawal and Zeng, "Introduction to Wireless and Mobile Systems", 1<sup>st</sup> Edition, Thomson Learning, 2002.
- Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, 2003.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VII**

<b>12CS3710</b>	<b>INTERNET PROGRAMMING LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

**Objective:**

- *To learn the Project Development based on the Client tier using HTML/JS, JDBC and Presentation tier using JSP with back end database such as MS-Access or Oracle 9i.*

**LIST OF EXPERIMENTS**

1. Object Oriented Concepts using Java.
2. HTML/Java Script.
3. JDBC.
4. JSP.
5. Servlets.
6. Project – Develop & Deploy Web Application.

**Total Hours: 45**

**List of Equipments and Software required for a batch of 30 students**

1. SOFTWARE REQUIRED – JDK, Tomcat Server.
2. OPERATING SYSTEM – Windows XP/7.
3. COMPUTERS REQUIRED – 30 Nos. (Minimum Requirements: Pentium III or Pentium IV with 256 RAM and 40 GB Hard Disk).

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VIII**

12IT4841

**CLOUD COMPUTING**  
(Common to CS & IT)

L	T	P	C
3	0	0	3

**Objectives:**

- To learn about different services offered by cloud.
- To understand the design and implementation of cloud-based applications.
- To study the security and storage concepts in cloud.

**UNIT – I INTRODUCTION 09 Hrs**

Cloud computing basics: Cloud computing –Cloud Types - Characteristics of Cloud computing – Assessing the role of Open Standards - Measuring the cloud's value - Cloud Architecture: Exploring the cloud computing stack.

**UNIT – II CLOUD SERVICES 09 Hrs**

Understanding Services and Applications by Type: Defining Infrastructure as a service- Defining Platform as a Service- Defining software as a Service – Defining Identity as a Service, Understanding Abstraction and virtualization: Virtualization Technologies – Load Balancing and Understanding Hypervisors- Machine Imaging – Porting application.

**UNIT – III CLOUD PLATFORMS 09 Hrs**

Platform as a Service: PaaS Applications Frameworks – Using Amazon Web Services: Amazon Web service components and Services – Working with Elastic Compute Cloud (EC2) – Working with Amazon Storage systems- Understanding Amazon Database Services.

**UNIT – IV MICROSOFT CLOUD SERVICES AND CLOUD SECURITY 09 Hrs**

Microsoft Cloud Services: Exploring Microsoft Cloud services – Windows Azure Platform, Cloud Security: Securing the cloud – Securing Data – Establishing Identity and Presence.

**UNIT – V SERVICE ORIENTED ARCHITECTURE AND CLOUD STORAGE 09 Hrs**

Service Oriented Architecture: Introducing service Oriented Architecture – SOA Communications – Managing and Monitoring SOA. Cloud storage: Provisioning Cloud Storage – Exploring Cloud Backup Solutions – Cloud Storage Interoperability.

**Total Hours: 45****Text Books:**

1. Barrie Sosinsky, "Cloud Computing Bible". Wiley Publishing, 2011.
2. Anthony T .Velte, Toby J.Velte, Robert Elsenpeter, "Cloud Computing: A Practical Approach", Tata McGraw Hill Edition, Fourth Reprint, 2010.

**References:**

1. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud". 1<sup>st</sup> Edition, Orelly's Publisher, 2009.
2. Ronald L. Krutz and Russell Vines, "Cloud Security: A Comprehensive Guide to Secure Cloud Computing", 1<sup>st</sup> Edition, Wiley Publishing, 2010.
3. Kris Jamsa, "Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models Mobile, Security and more", Jones & Bartlett Learning Company LLC, 2013.
4. Bloor R., Kanfman M. and Halper F. Judith Hurwitz "Cloud Computing for Dummies", Wiley India, 2010.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

<b>12EC4601</b>	<b>ANALOG AND DIGITAL COMMUNICATION (ELECTIVE)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objective:**

- To understand different types of analog and digital transmission techniques.
- To familiarize different data communication techniques.
- To gain knowledge of spread spectrum modulation and multiple access techniques.

**UNIT – I                      FUNDAMENTALS OF ANALOG COMMUNICATION                      09 Hrs**

Introduction – Modulation and demodulation – Types of analog modulation – AM envelope – Calculation of modulation index and percentage of modulation – AM frequency spectrum and Bandwidth – AM Voltage distribution, AM power distribution – Angle modulation – FM and PM waveforms, Phase deviation and frequency deviation, Modulation index, Frequency analysis and bandwidth requirement of angle modulated waves.

**UNIT – II                      DIGITAL COMMUNICATION                      09 Hrs**

Introduction – Shannon's information capacity theorem – Amplitude shift keying – Frequency shift keying – Phase shift keying – Binary phase shift keying – Differential BPSK – QPSK – Bandwidth efficiency – Carrier recovery methods – Squaring loop and costas loop.

**UNIT – III                      DIGITAL TRANSMISSION                      09 Hrs**

Introduction – Pulse modulation – PCM – PCM sampling, sampling rate, Signal to quantization noise ratio – Companding: Analog and Digital – Percentage error – Delta modulation – Adaptive delta modulation – DPCM – Intersymbol interference and eye patterns.

**UNIT – IV                      DATA COMMUNICATIONS                      09 Hrs**

History of data communications – Standards organizations for data communication – Data communication circuits – Data communication codes – Error control – Error detection – Error correction – Data communication Hardware – Serial interfaces – Data modems – Asynchronous modem – Synchronous modem – Low speed modem – Medium and high speed modem – Modem control.

**UNIT – V                      SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES                      09 Hrs**

Introduction – Pseudo noise sequences – PN sequence generation – DS spread spectrum with coherent binary PSK, Processing gain – FH spread spectrum – Multiple access techniques – Wireless communication – TDMA and CDMA in wireless communication systems.

**Total Hours: 45**

**Text Books:**

1. Wayne Tomasi, "Advanced Electronic Communication Systems", Pearson Education, 5<sup>th</sup> Edition, 2013.
2. Simon Haykin, "Communication Systems", 4<sup>th</sup> Edition, John Wiley & Sons, 2012.

**References:**

1. H.Taub, D.L. Schilling, and G. Saha, "Principles of Communication", 3<sup>rd</sup> Edition, Tata McGraw-Hill, 2007.
2. B.P. Lathi and Zhi Ding, "Modern Digital and Analog Communication systems", 4<sup>th</sup> Edition, Oxford University Press, 2010.
3. R. Blake, "Electronic Communication Systems", 2<sup>nd</sup> Edition, Thomson Delmar Publications, 2002.
4. Martin S. Roden, "Analog and Digital Communication System", 3<sup>rd</sup> Edition, PHI, 2002.
5. B. Sklar, "Digital Communication Fundamentals and Applications", 2<sup>nd</sup> Edition, Pearson Education, 2007.



## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VI**

<b>12CS4602</b>	<b>ADVANCED COMPUTER ARCHITECTURE (ELECTIVE)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objective:**

- To learn the concepts of instruction level parallelism, data level parallelism, memory hierarchy design and multiprocessors architecture.

**UNIT – I                    INSTRUCTION-LEVEL PARALLELISM                    09 Hrs**

Concepts and challenges – Hardware and Software approaches: overcoming data hazards with dynamic scheduling – hardware based speculation – basic compiler techniques for exposing ILP – Branch Prediction.

**UNIT – II                    HARDWARE AND SOFTWARE FOR VLIW AND EPIC                    09 Hrs**

VLIW and EPIC architecture – Advanced compiler support: Software Pipelining and Trace Scheduling – Hardware support for exposing Parallelism – Hardware support for compiler speculation – IA64 Processor.

**UNIT – III                    DATA-LEVEL PARALLELISM                    09 Hrs**

Vector Processor: architecture – multiple lanes – vector length registers – vector mask registers and memory banks – Graphics Processing Units: GPU computational structure – Instruction set architecture – Memory structures – detecting and enhancing loop level parallelism.

**UNIT – IV                    MEMORY HIERARCHY DESIGN                    09 Hrs**

Overview of memory hierarchy – Cache memory optimization: reducing miss rate – reducing miss penalty – reducing hit time – Main memory optimization: organization of DRAM technology – improving memory performance – Protection: Virtual Memory and Virtual Machines.

**UNIT – V                    MULTIPROCESSOR ARCHITECTURE                    09 Hrs**

Centralized shared-memory architecture – Distributed-memory architecture – Multiprocessor cache coherence – Directory based and snooping coherence protocols – synchronization – models of memory consistency.

**Total Hours: 45****Text Books:**

- John L. Hennessey and David A. Patterson, "Computer Architecture – A Quantitative Approach", 5<sup>th</sup> Edition, Morgan Kaufmann, 2012.
- William Stallings, "Computer Organization and Architecture – Designing for Performance", 8<sup>th</sup> Edition, Pearson Education, 2010.

**References:**

- Behrooz Parhami, "Computer Architecture", Oxford University Press, 2009.
- M. Morris Mano, "Computer System Architecture", 3<sup>rd</sup> Edition, Pearson Education, 2007.
- Hesham El-Rewini and Mostafa Abd-El-Barr, "Advanced Computer Architecture and Parallel Processing", John Wiley & Sons, 2005.
- Hwang, "Advanced Computer Architecture", Tata McGraw-Hill Education, 2003.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

<b>12CS4603</b>	<b>COMPONENT BASED TECHNOLOGY (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objectives:**

- To gain knowledge on Component technologies.
- To learn Java, CORBA and .Net based component technologies.
- To study the concepts of component frameworks and developments.

**UNIT – I                      FUNDAMENTALS OF COMPONENT TECHNOLOGIES                      09 Hrs**

Software Components – objects – fundamental properties of Component technology – modules – interfaces – callbacks – directory services – component architecture – components and middleware.

**UNIT – II                      JAVA BASED COMPONENT TECHNOLOGIES                      09 Hrs**

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                      CORBA COMPONENT TECHNOLOGIES                      09 Hrs**

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                      . NET BASED COMPONENT TECHNOLOGIES                      09 Hrs**

COM – Distributed COM – object reuse – interfaces and versioning – dispatch interfaces – connectable objects – OLE containers and servers – ActiveX controls – .NET components - assemblies – appdomains – contexts – reflection – remoting.

**UNIT – V                      COMPONENT FRAMEWORKS AND DEVELOPMENTS                      09 Hrs**

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 Hours: 45**

**Text Books:**

1. Clemens Szyperski, "Component Software: Beyond Object-Oriented Programming", Pearson Education, 2011.
2. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons, 2006.

**References:**

1. Mowbray, "Inside CORBA", Pearson Education, 2003.
2. Freeze, "Visual Basic Development Guide for COM & COM+", BPB Publications, 2001.
3. Hortsamann, Cornell, "CORE JAVA", Volume – II, Sun Microsystems Press, 2002.
4. G. Sudha Sadasivam, "Component Based Technology", John Wiley & Sons, 2008.

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VI**

<b>12CS4604</b>	<b>SOFTWARE REQUIREMENTS ENGINEERING (ELECTIVE)</b>	L	T	P	C
		3	0	0	3

**Objectives:**

- To develop student's knowledge in classifying, analyzing, gathering, validating and managing system requirements.
- To understand the tools and techniques in requirement engineering and management.

**UNIT – I REQUIREMENTS ENGINEERING AND MANAGEMENT 09 Hrs**

Introduction to requirements – Requirement Management Scenarios – Approaches to Requirement Management – Understanding Requirement – Classification of Requirement based on Functionality Consideration - Product Construction - Source of Requirement – Levels and Evolution of Requirement.

**UNIT – II REQUIREMENTS ELICITATION AND ANALYSIS 09 Hrs**

Elicitation of Requirement – Gathering Requirement – Elicitation and Gathering in Agile projects, COTS, Testing, Software Maintenance and Real time Projects - pitfalls in Requirement Elicitation and Gathering – Requirement Analysis – Establishment of Requirements – Documentation – Quality Control – Configuration Management – Establishment of Requirement in COTS - Software Maintenance – Migration - Porting and Conversion - Agile Development Projects.

**UNIT – III REQUIREMENTS VALIDATION, PLANNING & CHANGE MANAGEMENT 09 Hrs**

Quality Assurance – Verification – Validation – Quality Control Activities – Planning for Requirement Management – Planning for Requirement Management in Projects – Requirement change Management – Communication and Origination of changes – Change Request Resolution and Implementation – CRR – Status Reporting – Handling Impact of CRs.

**UNIT – IV REQUIREMENT TRACKING AND MEASUREMENT 09 Hrs**

Requirements Traceability – Need for Requirement Traceability – Mechanisms – Tracking of Requirement – Requirements Reporting – Reconciliation of Requirement – Measurement & Metrics – Metrics relevant to Requirement Engineering & Management – Roles & Responsibilities in REM – Role of Organization – Role of Individuals.

**UNIT – V TOOLS AND TECHNIQUES IN REM 09 Hrs**

Requirement Management through SDLC – Pre-Project phase – RM in Requirement Phase – Software Design & Construction – Testing – Installation and Commissioning – RM through SDLC – Tools & Techniques for REM – Introduction – Structured System Analysis and Design – IEEE Software Engineering Standards – Unified Modeling Language – Agile Methods.

**Total Hours: 45****Text Books:**

1. Murali Chemuturi, "Requirements Engineering and Management for Software Development Projects", Springer, 2012.
2. Karl E. Wiegers and Joy Beatty, "Software Requirements", 3<sup>rd</sup> Edition, Microsoft Press, 2013.

**References:**

1. Alex van Lamsweerde, "Requirements Engineering: From System Goals to UML Models to Software Specifications", Wiley, 2009.
2. Suzanne Robertson and James Robertson, "Mastering the requirements process", 2<sup>nd</sup> Edition, Pearson Education, 2006.
3. Murali Chemuturi, "Requirements Engineering and Management for Software Development Projects", Springer, 2012.
4. Dwayne Phillips, "The Software Project Manager's Handbook: Principles That Work at Work", John Wiley & Sons, 2004.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VI**

<b>12CS4605</b>	<b>REAL TIME SYSTEMS (ELECTIVE)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3

**Objective:**

- *To learn programming languages and tools, databases, communication and evaluation techniques for real time systems.*

**UNIT – I                      FUNDAMENTALS OF REAL TIME SYSTEMS                      09 Hrs**

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 – Fault Tolerant Scheduling.

**UNIT – II                      PROGRAMMING LANGUAGES AND TOOLS                      09 Hrs**

Introduction – 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                      09 Hrs**

Introduction – Basic Definitions – 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                      REALTIME COMMUNICATION                      09 Hrs**

Communications Media – Network Topologies – Protocols – Fault Tolerance Techniques – Fault Types – Fault Detection – Fault Error containment – Redundancy – Data Diversity – Reversal Checks – Integrated Failure handling.

**UNIT – V                      EVALUATION TECHNIQUES                      09 Hrs**

Reliability Evaluation Techniques – Obtaining Parameter Values – Reliability Models for Hardware Redundancy – Software Error models – Clock Synchronization – A Nonfault-Tolerant Synchronization Algorithm – Impact of Faults – Fault Tolerant Synchronization in Hardware – Fault Tolerant Synchronization in Software.

**Total Hours: 45**

**Text Books:**

1. C.M. Krishna and Kang G. Shin, "Real-Time Systems", Tata McGraw-Hill, 2010.
2. Stuart Bennett, "Real Time Computer Control-An Introduction", 2<sup>nd</sup> Edition, Prentice Hall, 2009.

**References:**

1. Peter D. Lawrence, "Real time Micro Computer System Design – An Introduction", Tata McGraw-Hill, 2000.
2. Jane W. S. Liu, "Real Time Systems", 8<sup>th</sup> Impression, Pearson Education, 2009.
3. R.J.A Buhur and D.L. Bailey, "An Introduction to Real-Time Systems", Prentice-Hall, 2002.
4. Philip. A. Laplante "Real Time System Design and Analysis", 4<sup>th</sup> Edition, PHI , 2011.

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VII**

<b>12EC4741</b>	<b>DIGITAL IMAGE PROCESSING (ELECTIVE)</b> (Common To CS, EC & IT)	L	T	P	C
		3	0	0	3

**Objective:**

- To learn the fundamental representation of images.
- To know the concept of various transforms using images.
- To understand the various techniques of image enhancement, restoration, segmentation representation and compression.

**UNIT – I DIGITAL IMAGE FUNDAMENTALS 09 Hrs**

Elements of digital image processing systems – Elements of visual perception – basic relationship between pixels, Connectivity, Distance measure – Brightness – Contrast – Hue – Saturation – Mach band effect - Color image fundamentals – RGB – HIS models – Conversion from RGB to HIS – Image sampling – quantization – dither.

**UNIT – II IMAGE TRANSFORMS 09 Hrs**

2D transforms – DFT – DCT – DST – Walsh – Hadamard – Slant – Haar – KL Transform – DWT: Haar wavelet, Daubechies wavelet.

**UNIT – III IMAGE ENHANCEMENT AND RESTORATION 09 Hrs**

Spatial domain enhancement: Gray level transformations – Histogram modification and specification techniques – Image averaging – Directional Smoothing – Median – Geometric mean – Harmonic mean – Contra harmonic and Yp mean filters – Homomorphic filtering – Color image enhancement. Image Restoration: Degradation model – Unconstrained restoration and constrained restoration – Inverse filtering – Wiener filtering – Geometric Transformations.

**UNIT – IV IMAGE SEGMENTATION AND REPRESENTATION 09 Hrs**

Line and point detection, Edge detection, Edge linking via Hough transform – Morphological operation – Thresholding – Region based segmentation – Region growing – Region splitting and Merging – Representation: Chain codes, Signatures, Boundary segments, Skeletons.

**UNIT – V IMAGE COMPRESSION 09 Hrs**

Need for data compression – Lossless compression: Run length coding, Bit plane coding, LZW coding. Lossy compression: Scalar quantization, Vector quantization, Block Truncation coding – Applications: Satellite image processing, Digital image watermarking.

**Total Hours: 45****Text Books:**

1. Rafael C Gonzalez and Richard E Woods, "Digital Image Processing", 3<sup>rd</sup> Edition, Pearson Education, 2011.
2. S. Jayaraman, S. Esakkirajan and T. Veerakumar, "Digital Image Processing", Tata McGraw-Hill, 2009.

**References:**

1. Anil K Jain, "Fundamentals of Digital Image Processing", PHI, 2002.
2. Kenneth R. Castleman, "Digital Image Processing", 2<sup>nd</sup> Reprint, Pearson Education, 2008.
3. William K Pratt, "Digital Image Processing", John Wiley, 2002.
4. Rafael C Gonzalez, Richard E Woods and Steven Eddins, "Digital Image Processing using MATLAB", 2<sup>nd</sup> Edition, Pearson Education, 2004.
5. B. Chanda and D. Dutta Majumder, "Digital Image Processing and Analysis", 2<sup>nd</sup> Edition, PHI, 2011.
6. David Salomon, "Data Compression – The Complete Reference", Springer - Verlag, 2<sup>nd</sup> Edition, PHI, 2011.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VII**

<b>12IT4702</b>	<b>ENTERPRISE RESOURCE PLANNING (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objectives:**

- To understand the components and modules of ERP System.
- To obtain Knowledge in development and significance of ERP Systems.
- To understand the business benefits of ERP System.

**UNIT – I INTRODUCTION 09 Hrs**

Overview of an Enterprise – Benefits of ERP– ERP and Related Technologies – Business Process Reengineering (BPR)– Data Warehousing – Data Mining – OLAP – SCM.

**UNIT – II ERP IMPLEMENTATION 09 Hrs**

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 THE BUSINESS MODULES 09 Hrs**

Business modules in an ERP Package – Finance – Manufacturing – Human Resources – Plant Maintenance – Materials Management – Quality Management – Marketing – Sales, Distribution and Service.

**UNIT – IV ERP MARKET 09 Hrs**

Market place – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software – Epicor – Intutive – BI - BO .

**UNIT – V ERP PRESENT AND FUTURE 09 Hrs**

Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP– Case studies.

**Total Hours: 45**

**Text Books:**

1. Alexis Leon, "ERP Demystified", 2<sup>nd</sup> Edition, Tata McGraw-Hill, 2008.
2. D P Goyal, "Enterprise Resource Planning", Tata McGraw-Hill Education, 2011.

**References:**

1. Mary Sumner, "Enterprise Resource Planning", Pearson Education, 2007.
2. Jim Mazzullo, "SAP R/3 for Everyone", Pearson Education, 2007.
3. Vinod Kumar Garg and Venkitakrishnan N K, Enterprise Resource Planning – Concepts and Practice, PHI, 2003.
4. Ellen Monk and Bret Wagner, " Concepts in Enterprise Resource Planning", 4<sup>th</sup> Edition, Thompson Course Technology, 2012.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – VII**

<b>12CS4703</b>	<b>DATA WAREHOUSING AND DATA MINING (ELECTIVE)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objectives:**

- To learn the concepts of data warehousing, data mining and to obtain knowledge of current data mining applications.
- To learn the concepts, strategies and methodologies for the design and construction of data mining.

**UNIT – I DATA WAREHOUSING 09 Hrs**

Introduction – Data Warehouse : Multidimensional Data Model – Data Warehouse Architecture – Implementation – Further Development – Data Warehousing to Data Mining – Data Extraction, Cleanup and Transformation & Loading Tools.

**UNIT – II DATA MART AND ONLINE ANALYTICAL PROCESSING 09 Hrs**

Data marts – Types – Loading – Metadata – Data Model – Maintenance – Nature of data – software components: external data – reference data – performance issues, monitoring requirements and security – Online Analytical Processing (OLAP) – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Data warehouse schemas – Categories of Tools – OLAP Tools and the Internet.

**UNIT – III DATA MINING CONCEPTS 09 Hrs**

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 09 Hrs**

Association Rule Mining – Single-Dimensional Boolean Association Rules from Transactional Databases – Multi-Level Association Rules from Transaction Databases – Classification and Prediction-Basic Concepts - Decision Tree Induction – Bayesian Classification – Rule Based Classification – Classification by Backpropagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction.

**UNIT – V CLUSTERING AND DATA MINING APPLICATIONS 09 Hrs**

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

**Total Hours: 45****Text Books:**

1. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", 13<sup>th</sup> Reprint, Tata McGraw-Hill, 2008.
2. J. Han and M. Kamber, "Data Mining: Concepts and Techniques", Morgan Kauffman, 2011.

**References:**

1. Margaret H. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education, 2004.
2. Sam Anahory and Dennis Murry, "Data Warehousing in the real world", Pearson Education, 2003.
3. S. Nagabhushana, "Data Warehousing: OLAP and Data Mining", New Age International, 2006.
4. Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann, 2001.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VII**

<b>12CS4704</b>	<b>KNOWLEDGE BASED DECISION SUPPORT SYSTEM (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objective:**

- To learn and understand the various aspects of managerial support system such as decision making, Information Support Systems, Knowledge Base systems, Artificial Intelligence and Current Issues.

**UNIT – I                      DECISION MAKING AND COMPUTERIZED SUPPORT                      09 Hrs**

Decision making, Systems, Modeling, and support – Introduction and Definition – Systems – Models – Modeling process – Decision making: The intelligence phase – The design phase - The choice phase – Evaluation: The implementation phase –Alternative Decision – Making models – Decision support systems – Decision makers.

**UNIT – II                      DECISION SUPPORT SYSTEMS                      09 Hrs**

Decision Support System Development: Introduction – System development Life cycle – Methodologies – prototype – Technology Levels and Tools – Development platforms – Tool selection – Developing DSS. Enterprise systems: Concepts and Definition – Evolution of information systems – Information needs – Characteristics and capabilities – Comparing and Integrating EIS and DSS – EIS data access, Data Warehouse, OLAP, Multidimensional analysis, Presentation and the web – Including soft information enterprise on systems - Organizational DSS – supply and value chains and decision support – supply chain problems and solutions – computerized systems MRP, ERP, SCM – frontline decision support systems.

**UNIT – III                      KNOWLEDGE DISCOVERY MANAGEMENT                      09 Hrs**

Introduction – Organizational learning and memory – Knowledge management –Development –methods, Technologies, and Tools – success –Knowledge management and Artificial intelligence – Electronic document management. Knowledge acquisition and validation: Knowledge engineering – Scope – Acquisition methods - Interviews – Tracking methods – Observation and other methods – Grid analysis – Machine Learning: Rule induction, case-based reasoning – Neural computing – Intelligent agents – Selection of an appropriate knowledge acquisition methods – Multiple experts – Validation and verification of the knowledge base – Analysis, coding, documenting, and diagramming – Numeric and documented knowledge acquisition – Knowledge acquisition and the Internet/Intranets. Knowledge representation: Introduction – Representation in logic and other schemas – Semantic networks – Production rules – Frames – Multiple knowledge representation – Experimental knowledge representations - Representing uncertainty.

**UNIT – IV                      INTELLIGENT SYSTEMS                      09 Hrs**

Inference Techniques: Reasoning in artificial intelligence – Inference with rules: The Inference tree – Inference with frames – Model-based and case-based reasoning - Explanation and Meta knowledge – Inference with uncertainty – Representing uncertainty – Probabilities and related approaches – Theory of certainty – Approximate reasoning using fuzzy logic. Intelligent Systems Development: Prototyping: Project Initialization – System analysis and design – Software classification: Building expert systems with tools – Shells and environments – Software selection – Hardware –Rapid prototyping and a demonstration prototype - System development –Implementation – Post implementation.

**UNIT – V                      MANAGEMENT SUPPORT SYSTEMS                      09 Hrs**

Implementing and integrating management support systems – Implementation - The major issues - Strategies – System integration – Generic models MSS, DSS, ES – Integrating EIS, DSS and ES, and global integration – Intelligent DSS – Intelligent modeling and model management – Examples of integrated systems – Problems and issues in integration. Impacts of Management Support Systems – Introduction –

[Contd..]



overview – Organizational structure and related areas – MSS support to business process reengineering – Personnel management issues – Impact on individuals – Productivity, quality, and competitiveness – decision making and the manager manager's job – Issues of legality, privacy, and ethics – Intelligent systems and employment levels – Internet communication – other societal impacts – managerial implications and social responsibilities – Future of management support system.

**Total Hours: 45**

**Text Books:**

1. Efraim Turban, Jay E. Aronson Ting-Peng Liang, "Decision Support Systems and Intelligent Systems", 7<sup>th</sup> Edition, Pearson Education, 2005.
2. George M Marakas, "Decision support Systems", 2<sup>nd</sup> Edition, Pearson Education, 2002.

**References:**

1. V.S. Janakiraman and K. Sarukesi, "Decision Support Systems", 2006.
2. Efreem G Mallach, "Decision Support systems and Data warehouse Systems", Tata McGraw-Hill, 2008.
3. Donald Hislop, "Knowledge Management in Organizations: A Critical Introduction", Oxford University Press, 2013.
4. Shelda Debowski, "Knowledge Management", John Wiley & Sons, 2007.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VII**

<b>12CS4705</b>	<b>ARTIFICIAL INTELLIGENCE (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objective:**

- To learn the basics of designing intelligent agents to solve general purpose problems, represent and process knowledge, plan and act, to learn from experiences and communicate with other agents.

**UNIT – I                      FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE                      09 Hrs**

Intelligent Agents – Agents and environments – Good behavior – Nature of environments – Structure of agents – Problem Solving : Problem solving agents – Example problems – Searching for solutions – Un-informed search strategies – Avoiding repeated states – Searching with partial information.

**UNIT – II                      INFORMED SEARCHING TECHNIQUES                      09 Hrs**

Informed search and exploration – Informed search strategies – Heuristic function – Local search algorithms and optimistic problems – Constraint Satisfaction Problems (CSP) – Backtracking search – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning.

**UNIT – III                      LOGICAL REASONING                      09 Hrs**

First order logic – Representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic – Inference in First order logic – Propositional versus first order logic – Unification and lifting – Forward chaining – Backward chaining – Resolution – Knowledge representation.

**UNIT – IV                      PLANNING                      09 Hrs**

Planning Problem – Planning with state – space search – Partial-order planning – Planning graphs – Planning and acting in the real world :Time schedules and resources – Planning and acting in non deterministic Domain – Conditional Planning – Execution monitoring and replanning – Continuous planning and Multi agent planning.

**UNIT – V                      LEARNING AND COMMUNICATIONS                      09 Hrs**

Learning from observation – Inductive learning – Decision trees – Explanation based learning Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction.

**Total Hours: 45**

**Text Books:**

- Stuart Russell and Peter Norvig, "Artificial Intelligence – A Modern Approach", Pearson Education, 2<sup>nd</sup> Edition, 2013.
- Elaine Rich, Kevin Knight and Shivashankar B.Nair, "Artificial Intelligence", Tata McGraw-Hill, 2<sup>nd</sup> Edition, 2009.

**References:**

- David Poole, Alan Mackworth and Randy Goebel, "Computational Intelligence: A logical approach", Oxford University Press, 2004.
- G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem solving", Pearson Education, 4<sup>th</sup> Edition, 2002.
- Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
- Stuart Jonathan Russell, Peter Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, 2010.

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VII**

<b>12IT4706</b>	<b>ELECTRONIC COMMERCE (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objectives:**

- To understand the basics concepts of e-commerce.
- To know the e-commerce applications and their security.
- To become aware of various standard of e-commerce available in the market.

**UNIT – I INTRODUCTION 09 Hrs**

E-Commerce framework – E- Business models - Network infrastructure for E-commerce – Internet as a Network Infrastructure – E-commerce and World Wide Web.

**UNIT – II E-COMMERCE 09 Hrs**

Consumer oriented E-Commerce- Applications - Mercantile process models - Electronic Payment Systems – Digital Token based EPS – Smart cards – Credit cards – Risks – designing EPS – Paypal – ebay.

**UNIT – III INTERORGANIZATIONAL COMMERCE AND EDI 09 Hrs**

Electronic Data Interchange: EDI applications in Business – EDI and E-Commerce – EDI standardization and implementation – Internet based EDI.

**UNIT – IV SECURITY ISSUES IN E-COMMERCE 09 Hrs**

Network Security – Client-Server Network Security – CS Security Threats – Firewalls – Data & Message Security – Encrypted Documents – Security on the Web.

**UNIT – V INTRAORGANIZATIONAL E-COMMERCE AND MARKETING 09 Hrs**

Internal Information System – Work-flow Automation and Coordination – Supply Chain Management – Document Library – Types of Digital Documents – Corporate Data Warehouses – Advertising and Marketing on the Internet .

**Total Hours: 45****Text Books:**

1. Ravi Kalakota and Andrew B Whinston, "Frontiers of Electronic Commerce", Pearson Education Asia, 2009.
2. Marilyn Greenstein and Todd M Feinman , " Electronic commerce: Security, Risk Management andControl " Tata McGraw-Hill , 2000.

**References:**

1. Judy Strauss and Raymond Frost, "E Marketing", PHI, 2002.
2. Brenda Kienan, "Managing E Commerce Business", PHI, 2001.
3. Vivek Sharma and Rajiv Sharma, "Developing ECommerce Sites – an integrated approach", Pearson Education Asia, 2000.
4. Kamalesh K. Bajaj, "E-Commerce: The Cutting Edge & Business", Tata McGraw-Hill, 2003.



## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VII**

<b>12CS4708</b>	<b>SOFT COMPUTING (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objectives:**

- To impart knowledge on the working principles and applications of Genetic Algorithms.
- To understand Neural Network architecture and its function.
- To impart knowledge on Fuzzy Logic and Fuzzy Systems.

**UNIT – I INTRODUCTION TO SOFT COMPUTING 09 Hrs**

Evolution of Computing – Soft Computing Constituents – Conventional AI to Computational Intelligence – Machine Learning Basics.

**UNIT – II GENETIC ALGORITHMS 09 Hrs**

Introduction – Biological Background – Operators and Techniques in Genetic Algorithms – Classification of Genetic Algorithms – Applications.

**UNIT – III NEURAL NETWORKS 09 Hrs**

Machine Learning Using Neural Network – Adaptive Networks – Feed forward Networks – Supervised Learning Neural Networks – Radial Basis Function Networks – Reinforcement Learning – Unsupervised Learning Neural Networks – Adaptive Resonance architectures – Advances in Neural networks.

**UNIT – IV FUZZY LOGIC 09 Hrs**

Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions – Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making.

**UNIT – V NEURO-FUZZY MODELING 09 Hrs**

Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification and Regression Trees – Data Clustering Algorithms – Rule based Structure Identification – Neuro-Fuzzy Control – Case studies.

**Total Hours: 45****Text Books:**

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun and Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall of India, 2007.
2. Sivanandam. S.N. and Deepa .S.N., "Introduction to Genetic Algorithms", Springer, 2013.

**References:**

1. Timothy J. Ross, "Fuzzy Logic with Engineering Applications", Wiley, 3<sup>rd</sup> Edition, 2010.
2. Simon Haykin, "Neural Networks and Learning Machines", Prentice Hall, 3<sup>rd</sup> Edition, 2009.
3. Rajasekaran. S. and Vijayalakshmi Pai. G.A., "Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications", PHI Learning, 2004.
4. David E. Goldberg, "Genetic Algorithm in Search Optimization and Machine Learning" Pearson Education, 2013.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VII**

<b>12IT4709</b>	<b>ADVANCED DATABASE TECHNOLOGY (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objectives:**

- To understand the basics of Database Management Systems.
- To have an overview of Data Warehousing concepts.
- To know about various types of Database Management systems

**UNIT – I                      DATABASE SYSTEM DESIGN                      09 Hrs**

Storage and File Structure – Query Processing Algorithms – Query Optimization Techniques –Physical Database Design and Tuning – Transaction Processing Concepts – Concurrency Control – Recovery Techniques – Database Security.

**UNIT – II                      DISTRIBUTED DATABASES                      09 Hrs**

Centralized versus Distributed databases – Distributed Database Concepts – Advantages of Distributed Databases – Additional functions of Distributed Databases –Fragmentation and Replication Techniques – Types of Distributed databases – Distributed database Architecture – Concurrency Control and Recovery Techniques in Distributed Databases – Client/Server Architecture.

**UNIT – III                      OBJECT ORIENTED AND RELATIONAL DATABASES                      09 Hrs**

Introduction to Object Oriented Concepts – Overview of the Object model of Object Data Management Group – Object Definition Language – Object Query Language – Object Database Conceptual Design – Functional Dependencies and Normalization for Relational Databases – Relational Database Design Algorithms.

**UNIT – IV                      ENHANCED DATA MODELS FOR ADVANCED APPLICATIONS                      09 Hrs**

Enhanced Data models – Web Databases – Temporal Databases – Incorporating Time in Relational Database - Incorporating Time in Object Oriented Database– Temporal Querying Constructs – Time Series Data – Spatial Databases – Overview of Data mining Techniques and Data Modeling for Data Warehouses.

**UNIT – V                      CURRENT ISSUES                      09 Hrs**

Active Database Concepts – Introduction to Deductive Databases – Clausal Form and Horn Clauses – Interpretation of Rules – Use of Relational Operations – Multimedia Databases – The Nature of Multimedia data and Applications – Text Database – Web Database – Geo graphic Information systems.

**Total Hours: 45**

**Text Books:**

1. RamezElmasri and B.Navathe, “Fundamentals of Database Systems”, 5<sup>th</sup> Edition, Addison Wesley, 2011.
2. Henry F.Korth, Abraham Silberschatz and S.Sudharshan, “Database system concepts”, 8<sup>th</sup> Edition, Tata McGraw-Hill, 2011.

**References:**

1. Raghu Ramakrishnan and Johannes Gehrke, “Database Management Systems”, 3<sup>rd</sup> Edition Tata McGraw-Hill, 2004.
2. Date C.J, “An Introduction to Database”, Addison-Wesley, 8<sup>th</sup> Edition, 2006.
3. Peter Rob and Carlos Coronel, “Database Systems – Design, Implementation, and Management”, 9<sup>th</sup> Edition, Thomson Learning, 2009.
4. Tamer M. Ozsu and Patrick Ualduriel, “Principles of Distributed Database Systems”, 2<sup>nd</sup> Edition, Pearson Education, 2003.

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

SEMESTER – VII

<b>12CS4710</b>	<b>TCP / IP SUITE (ELECTIVE)</b>	L	T	P	C
		3	0	0	3

**Objectives:**

- To learn the concepts of TCP/IP Protocol Suite and different types of networks.
- To learn Network Management and Multimedia protocols.

**UNIT – I TCP/IP PROTOCOL SUITE AND NETWORKS 09 Hrs**

TCP/IP Protocol suite – Addressing – Wired local area networks – Wireless LANs: IEEE 802.11, Bluetooth – Switched WANs: x.25 – Frame relay – ATM – Point to point WANs: 56k MODEMs - DSL Technology - Cable MODEM – Connecting devices: Repeaters – Bridges - Routers.

**UNIT – II NETWORK LAYER 09 Hrs**

Packet switching and Network layer – IPV4 addresses: Classful addressing, Classless addressing – IPV6 addressing – ARP: Address mapping, ARP protocol – Unicast routing protocols: RIP – OSPF - BGP – Multicast routing protocols: IGMP.

**UNIT – III TRANSPORT LAYER 09 Hrs**

Transport layer services – Transport layer protocols - UDP: UDP services- TCP: TCP services - Flow control - Error control - Congestion control- SCTP services.

**UNIT – IV APPLICATION LAYER 09 Hrs**

Dynamic Host Configuration Protocol – Domain Name Service – File Transfer Protocol – Hyper Text Transfer Protocol - Electronic Mail: Simple Mail Transfer Protocol – Post Office Protocol – Internet Message Access Protocol.

**UNIT – V NETWORK MANAGEMENT AND MULTIMEDIA 09 Hrs**

Management Components: SMI, MIB, SNMP- Multimedia: RTP – RTCP – VoIP - Integrated services - Differentiated services.

**Total Hours: 45****Text Books:**

1. Bherouz A. Forouzan, "TCP/IP Protocol suite", Tata McGraw-Hill, 4<sup>th</sup> Edition, 2010.
2. Tittel Chappell, "TCP/IP", CENGAGE Learning, 2009.

**References:**

1. Douglas E. Corner, "Interworking with TCP/IP, Principles, Protocols and Architecture", Prentice Hall, 4<sup>th</sup> Edition, 2004.
2. W. Richard Stevens, "TCP/IP Illustrated: The implementation", Volume – 2, Pearson Education, 2003.
3. Kenneth L. Calvert and Michael J. Donahoo, "TCP/IP Sockets in Java: Practical Guide for Programmers", 2<sup>nd</sup> Edition, Morgan Kaufmann, 2008.
4. Kevin R. Fall and W. Richard Stevens, "TCP/IP Illustrated", Volume 1, Addison-Wesley Professional, 2012.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VIII**

<b>12CS4801</b>	<b>MANAGEMENT INFORMATION SYSTEMS (ELECTIVE)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objectives:**

- To learn the development of Information system & organization, representation, analysis of system structure and maintenance.
- To understand the concepts of decision theory and applications.

**UNIT – I                      INFORMATION SYSTEM AND ORGANIZATION                      09 Hrs**

Role of Information systems in Business – Perspectives on Information systems – Contemporary Approaches – Business Process – Types – Systems for collaboration and Teamwork – Information system in business - Information Systems, Organization and Strategy.

**UNIT – II                      ETHICAL, SOCIAL ISSUES AND INFRASTRUCTURE                      09 Hrs**

Understanding Ethical and Social Issues – Ethics – Moral Dimensions – IT Infrastructure – Components – Contemporary Hardware, Software Platform Trends – Issues – Organizing Data - Database Approach – Data Management – Decision Making – Managing Data Resource.

**UNIT – III                      TELECOMMUNICATION, WIRELESS TECHNOLOGY AND SECURITY                      09 Hrs**

Telecommunication and Networking – Communication Networks – Global Internet – Wireless Revolution – System Vulnerability and Abuse – Business Value, Establishing a Framework for security and control - Technologies and Tools – Enterprise Systems – Supply chain Management – Customer Relationship Management – Enterprise Applications.

**UNIT – IV                      E-COMMERCE AND MANAGING KNOWLEDGE                      09 Hrs**

E-Commerce and Internet – Business and Technology – Mobile Digital Platform – Mobile E-Commerce – Building E-Commerce Websites – Knowledge Management Landscape – Enterprise wide Knowledge Management Systems – Knowledge Work Systems – Intelligent Techniques.

**UNIT – V                      BUILDING AND MANAGING SYSTEMS                      09 Hrs**

Systems as Planned Organizational Change – Overview – Alternative Systems – Application Development – Project Management – Selecting Projects – Establishing Business Value – Managing Project Risks – Growth and Organizing International Information Systems – Managing Global Systems – Technology Issues and Opportunities.

**Total Hours: 45**

**Text Books:**

1. K.C. Laudon and J.P. Laudon, “Management Information Systems: Managing the Digital Firm”, Pearson Education, 2013.
2. E.F. Turban, R.K. Turban and R.E. Potter, “Introduction to Information Technology”, John Wiley & Sons, 2004.

**References:**

1. Wiley and M.E. Brabston, “Management Information Systems: Managing the Digital Firm”, Pearson Education, 2002.
2. Jeffrey A. Hoffer, Joey F. George and Joseph S. Valachich, “Modern System analysis and Design”, 3<sup>rd</sup> Edition, Prentice Hall, 2002.
3. Terry Lucey, “Management Information Systems”, 9<sup>th</sup> Edition, Thomson, 2005.
4. James A O'Brien and Georage M Marakas, “Management Information Systems”, 7<sup>th</sup> Edition, Tata McGraw-Hill, 2008.



**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – VIII**

<b>12CS4802</b>	<b>GREEN COMPUTING (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

**Objective:**

- To learn the concepts and techniques of green computing.

**UNIT – I                   BASICS OF GREEN COMPUTING                   09 Hrs**

Role of Computer Consultants in Propagating Green Computing – Impact of Green Computing in the Industry – Grid Computing as a Better Research Initiative Tool – Effective Project Initiative – Green Computing Impact Development – Impact on Research – Adapting to Change in an Organization – Implementing Green Computing.

**UNIT – II                   BUSINESS IMPACT                   09 Hrs**

Basics of Business Impact – Organizational Development – Adopting Green Data Center – High Impact Computer: Computer Power and Versatility for Business and Home Use – Information Technology Consulting: Providing Expert IT Support for Businesses – Managing Organization.

**UNIT – III                   RESOURCES AND STANDARDS                   09 Hrs**

Resource allocation and Virtualization – Green Computers Initiatives – Green Computing Impact in Organization – Green Electronics Council – Challenges – Green Grid Framework – CSCI – EPEAT Standards – Green Computer – Green Computing Initiative Platforms.

**UNIT – IV                   GREEN IT                   09 Hrs**

Terminal servers – Power management – Operating system support – Power supply – Storage – Video card and Display – Scope of Green Computers – Green IT – Complementing Information Technology and Going Green – Organization Information Systems for Green Computing.

**UNIT – V                   MATERIALS RECYCLING AND TELECOMMUTING                   09 Hrs**

Materials Recycling: Web, Temporal and Spatial Data Mining – Telecommuting: Basics – Resources – Pros and Cons.

**Total Hours: 45****Text Books:**

1. Jason Harris, "Green Computing and Green IT Best Practices on Regulations and Industry Initiatives, Virtualization, Power Management, Materials Recycling and Telecommuting", Emereo Publishing, 2008.
2. Wu-chun Fang, "The Green Computing Book: Tackling Energy Efficiency at Large Scale", CRC Press, 2014.

**References:**

1. John Lamb, "The Greening of IT", Pearson Education, 2010.
2. Jae H. Kim and Myung J. Lee, "Green IT: Technologies and Applications", Springer, 2011.
3. Ishfaq Ahmad and Sanjay Ranka, "Handbook of Energy-aware and Green Computing", Volume 1, CRC Press, 2012.
4. Jinsong Wu, Sundeep Rangan and Honggang Zhang, "Green Communications: Theoretical Fundamentals, Algorithms and Applications", CRC Press, 2013.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VIII**

<b>12CS4803</b>	<b>NANO COMPUTING (ELECTIVE)</b> (Common to CS & IT)	L	T	P	C
		3	0	0	3

Objective:

- To learn the concepts of Nano computing, soft computing and functional machines.

**UNIT – I                      MICROELECTRONICS AND NANOSTRUCTURES                      09 Hrs**

Development of Microelectronics and Nanostructures – Complexity Problem – Challenges – Basics of Nanoelectronics: Electromagnetic Fields and Photons – Quantization of Action, Charge, and Flux – Electrons behaving as waves – Electrons in potential wells – Diffusion Process.

**UNIT – II                      BIOCHEMICAL AND QUANTUM-MECHANICAL COMPUTERS                      09 Hrs**

DNA Computer – Information Processing with Chemical reactions – Nanomachines – Parallel Processing – Quantum Computers – Bit and Qubit – Coherence and Entanglement – Quantum Parallelism.

**UNIT – III                      PARALLEL ARCHITECTURES FOR NANOSYSTEMS                      09 Hrs**

Mono and Multiprocessor Systems – Parallel Processing Considerations – Influence of Delay Time – Power Dissipation – Architecture for Processing Nanosystems: Classic Systolic Arrays – Processor with large memory – Processor array with SIMD and PIP Architectures – Reconfigurable Computers – Teramac as a Prototype.

**UNIT – IV                      SOFT COMPUTING AND NANO ELECTRONICS                      09 Hrs**

Methods of Soft Computing – Fuzzy Systems – Evolutionary Algorithms – Connectionistic Systems – Computationally Intelligent Systems – Characteristics of Neural Networks in Nanoelectronics – Local Processing – Distributed and Fault-tolerant Storage – Self-organization.

**UNIT – V                      NANOSYSTEMS AS INFORMATION PROCESSING MACHINES                      09 Hrs**

Nanosystems as Functional Machines – Information Processing as Information Modification – System Design and its interfaces – Requirements of Nanosystems – Uncertainties : Uncertainties in Nanosystems – In the Development of Nanoelectronics – Removal of Uncertainties by Nanomachines.

**Total Hours: 45**

**Text Books:**

1. Karl Goser, "Nanoelectronics and Nanosystems: From Transistors to Molecular and Quantum Devices", Springer, 2008.
2. Sandeep Shukla and R. Iris Bahar, "Nano, Quantum and Molecular Computing: Implications to high level design and validation", Kluwer Academic Publishers, 2010.

**References:**

1. Mick Wilson, Kamali Kannangara and Geoff smith, "Nanotechnology: Basic Science and Emerging Technologies", Overseas press, 2005.
2. Vishal Sahni, "Nanocomputing: The Future of Computing", Tata McGraw-Hill, 2008
3. Sahni V. and Goswami D., "Nano Computing", Tata McGraw-Hill, 2008.
4. Jean-Baptiste Waldner, "Nanocomputers and Swarm Intelligence", John Wiley & Sons, 2008.

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VIII**

<b>12CS4804</b>	<b>3D MODELING AND RENDERING (ELECTIVE)</b>	L	T	P	C
		3	0	0	3

**Objective:**

- To learn 3D Concepts, Modeling & Animation Techniques and Surface Rendering.

**UNIT – I                    3D CONCEPTS & TECHNIQUES                    09 Hrs**

Introduction – 3D Transformation – Rotation – Reflection – 3D Modeling Schemes – Types of Projections : Orthographic Projection – Isometric Projection – Oblique Projection – Perspective Projection – One-, Two- and Three-Point Perspective – Viewing Parameters – 3D Clipping.

**UNIT – II                    SURFACE GENERATION & DETECTION                    09 Hrs**

Parametric Representation – Quadric Surfaces – Bezier Surface – Bezier Surfaces Patch – B-Spline Surfaces – Rational B-Spline Surfaces – Visible Surface Detection: Hidden Surface Removal Algorithms – Hidden Line Removal Method.

**UNIT – III                    COLOUR, ILLUMINATION MODELS AND TEXTURING                    09 Hrs**

Colours – Illumination Model & Light Sources - Specular Reflection – Intensity Attenuation – Shadow – Reflectivity and Refractivity - Radiosity Model – Texturing: Surface Texture – Bump Mapping – Environment Mapping.

**UNIT – IV                    MODELING CONCEPTS AND TECHNIQUES                    09 Hrs**

Structures and Hierarchical Modeling – Hierarchical Modeling With Structures – Advanced Modeling Techniques – Procedural Models – Fractals – Grammar Based Models – Physical Based Modeling.

**UNIT – V                    ANIMATION AND SURFACE RENDERING                    09 Hrs**

Animation: Animation Sequences – Key frame systems – Motion specifications – Rendering: Polygon-Rendering Methods – Ray-Tracing Methods – Environment Mapping.

**Total Hours: 45****Text Books:**

- Amarendra N. Sinha, Arun D Udai, "Computer Graphics", Tata McGraw-Hill, 2013.
- Donald Hearn and M. Pauline Baker, "Computer Graphics - C Version", Pearson Education, 2011

**References:**

- Rick Parent, "Computer Animation Algorithms and Techniques", Morgan Kaufmann Publishers, 2<sup>nd</sup> Edition, 2009.
- Jeffrey J. McConnell, "Computer Graphics Theory into Practice", CBS Publishers, 2007.
- Eric Lengyel, "Mathematics for 3D Game Programming and Computer Graphics", 3<sup>rd</sup> Edition, Course Technology PTR, 2011.
- Lachmi Khemlani, "3D modelling, rendering, and animation", Tata McGraw-Hill, 2004.



## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VIII**

<b>12HS4821</b>	<b>TOTAL QUALITY MANAGEMENT</b> (Common to CS, IT, AU, CE, EE, & ME )	L	T	P	C
		3	0	0	3

**Objective:**

- To understand the Total Quality Management concept, tools available to achieve TQM and the ISO certification process.

**UNIT – I INTRODUCTION 09 Hrs**

Introduction – Need for quality – Evolution of quality – Definition of quality – Dimensions of manufacturing and service quality – Basic concepts of TQM – Definition of TQM – TQM implementation steps – Quality council – Importance of leadership and motivation in TQM – Contributions of Deming, Juran and Crosby – Barriers to TQM.

**UNIT – II TQM PRINCIPLES 09 Hrs**

Quality statements – Customer perception of quality – Customer complaints, Customer retention. Employee involvement, Empowerment, Team and Teamwork, Recognition and Reward – Continuous process improvement – Juran trilogy, PDSA cycle, 5s, Kaizen – Supplier partnership – Partnering, Supplier selection, Supplier Rating.

**UNIT – III STATISTICAL PROCESS CONTROL 09 Hrs**

The seven traditional tools of quality – Measurement of central tendency and dispersion, population and sample, normal curve, control chart ( $\bar{X}, R, p$ ) for variable and attributes, process capability – Seven new management tools – Six-sigma Concepts.

**UNIT – IV TQM TOOLS 09 Hrs**

Bench marking – reason , process – Quality circles concepts – FMEA – stages, types – Quality Function Deployment (QFD) – Taguchi quality loss function – TPM – concepts, improvement needs – Performance measures – criteria – Quality Cost.

**UNIT – V QUALITY SYSTEMS 09 Hrs**

Need for ISO 9000 – ISO 9001-2008, ISO 14000 Quality System – elements, implementation, Documentation. Quality auditing – concepts, requirements and benefits, non conformance report – Case studies of TQM implementation in manufacturing and service sectors.

**Total Hours: 45****Text Books:**

- Dale H.Besterfield, "Total Quality Management", 3<sup>rd</sup> Edition, Indian Reprint, Pearson Education, New Delhi, 2011.
- Dr. V. Jayakumar and Dr. R. Raju, "Total Quality Management", 15<sup>th</sup> Edition, Lakshmi publications, Chennai, 2013

**References:**

- B. Janakiraman and R.K. Gopal, "Total Quality Management – Text and Cases", 3<sup>rd</sup> Edition, Prentice Hall (India) Pvt. Ltd., New Delhi, 2006.
- L. Suganthi and Anand Samuel, "Total Quality Management", 5<sup>th</sup> Edition, Prentice Hall (India) Pvt. Ltd., New Delhi, 2006
- James R. Evans and William M. Lindsay, "The Management and Control of Quality", 6<sup>th</sup> Edition, South-Western (Thomson Learning), 2005.
- R. Subburaj, "Total Quality Management", 1<sup>st</sup> Edition, Tata McGraw-Hill, New Delhi, 2005.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VIII**

<b>12CS4807</b>	<b>QUANTUM COMPUTING (ELECTIVE)</b>	L	T	P	C
		3	0	0	3

**Objectives:**

- To learn the concepts, mechanics and applications of quantum computing.
- To gain knowledge in quantum searching algorithms.

**UNIT – I                      FUNDAMENTALS OF QUANTUM COMPUTING                      09 Hrs**

Fundamental Concepts: Introduction and Overview – Global Perspectives – Quantum Bits – Quantum Computation – Quantum Algorithms – Experimental Quantum Information Processing – Quantum Information.

**UNIT – II                      QUANTUM MECHANICS                      09 Hrs**

Quantum Mechanics – Linear Algebra – Postulates of Quantum Mechanics – Application – Density Operator – Schmidt decomposition & Purifications – EPR and Bell Inequality.

**UNIT – III                      COMPONENTS OF QUANTUM SYSTEMS                      09 Hrs**

Quantum Model of Computation – Quantum Circuits – Controlled operations – Measurement – Universal Quantum Gates – Simulation of Quantum systems.

**UNIT – IV                      APPLICATIONS                      09 Hrs**

Quantum Fourier Transform and its applications: Quantum Fourier Transform – Phase Estimation – Applications: Order finding and factoring – Finding Discrete Logarithms & Hidden Subgroups – Related Algorithms and Techniques.

**UNIT – V                      QUANTUM SEARCH ALGORITHMS AND ERROR CORRECTION                      09 Hrs**

Quantum Search Algorithms and Error Correction: Quantum Search Algorithm – Quantum Search as a Quantum Simulation – Quantum Counting – Speeding up the solution of NP-Complete Problems – Quantum Search of an unstructured Database – Optimality of the search Algorithm – Black Box Algorithm Limits – Quantum Error Correction.

**Total Hours: 45**

**Text Books:**

1. Michael A. Nielsen and Isaac L. Chuang, “Quantum Computation and Quantum Information”, Cambridge University Press, 2010.
2. Philip Kaye, Raymond Laflamme and Michele Mosca, “An Introduction to Quantum Computing”, Oxford University Press, 2007.

**Reference:**

1. Colin P. Williams, “Explorations in Quantum Computing”, Springer, 2010.
2. Mika Hirvensalo, “Quantum Computing”, Springer, 2004.
3. Vishal Sahni, “Quantum Computing”, Tata McGraw-Hill, 2007.
4. David McMahon, “Quantum Computing Explained”, John Wiley & Sons, 2008.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)****SEMESTER – VIII**

<b>12CS4808</b>	<b>NATURAL LANGUAGE PROCESSING (ELECTIVE)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	(Common to CS & IT)	3	0	0	3

**Objectives:**

- To learn the use of state automata for language processing.
- To understand the fundamentals of word classes, grammars, and parsing techniques.
- To impart knowledge on advanced features like feature structures and realistic parsing methodologies.
- To develop typical natural language processing applications.

**UNIT – I FUNDAMENTALS 09 Hrs**

Introduction: Knowledge in speech and language processing – Ambiguity – Models and Algorithms – Language, Thought and Understanding- Regular Expressions and automata: Regular expressions – Finite-State automata- Morphology and Finite-State Transducers: Survey of English morphology – Finite-State Morphological parsing – Combining FST lexicon and rules – Lexicon-Free FSTs: The porter stammer – Human morphological processing.

**UNIT – II SYNTAX 09 Hrs**

Word classes and part-of-speech tagging: English word classes – Tagsets for English – Part-of-speech tagging – Rule-based part-of-speech tagging – Stochastic part-of-speech tagging – Transformation-based tagging – Other issues- Context-Free Grammars for English: Constituency – Context-Free rules and trees – Sentence-level constructions – The noun phrase – Coordination – Agreement – The verb phrase and sub categorization – Auxiliaries – Spoken language syntax – Grammars equivalence and normal form – Finite-State and Context-Free grammars – Grammars and human processing- Parsing with Context-Free Grammars: Parsing as search – A Basic Top-Down parser – Problems with the basic Top-Down parser – The early algorithm – Finite-State parsing methods.

**UNIT – III ADVANCED FEATURES AND SYNTAX 09 Hrs**

Features and Unification: Feature structures – Unification of feature structures – Features structures in the grammar – Implementing unification – Parsing with unification constraints – Types and Inheritance-Lexicalized and Probabilistic Parsing: Probabilistic context-free grammar – problems with PCFGs – Probabilistic lexicalized CFGs – Dependency Grammars – Human parsing.

**UNIT – IV SEMANTIC 09 Hrs**

Representing Meaning: Computational desiderata for representations – Meaning structure of language – First order predicate calculus – Some linguistically relevant concepts – Related representational approaches – Alternative approaches to meaning. Semantic Analysis: Syntax-Driven semantic analysis – Attachments for a fragment of English – Integrating semantic analysis into the early parser – Idioms and compositionality – Robust semantic analysis – Lexical semantics: relational among lexemes and their senses – WordNet: A database of lexical relations – The Internal structure of words – Creativity and the lexicon.

**UNIT – V APPLICATIONS 09 Hrs**

Word Sense Disambiguation and Information Retrieval- Text Mining: Categorization – Extraction based Categorization- Clustering- Hierarchical Clustering-Document Classification and routing- Finding and organizing answers from Text search Use of categories and clusters for organizing retrieval results – Text Categorization and efficient Summarization using Lexical Chains – Pattern Extraction- Machine Translation: Language similarities and differences – The transfer metaphor – The interlingua idea: Using meaning – Direct translation – Using statistical techniques – Usability and system development.

**Total Hours: 45**

[Contd..]

**Text Books:**

1. Daniel Jurafsky and James H. Martin "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition", Pearson Edition, 2<sup>nd</sup> Edition, 2009.
2. Michael W. Berry, "Survey of Text Mining: Clustering, Classification and Retrieval", Springer Verlag, 2003.

**References:**

1. James Allen, "Natural Language Understanding", Pearson Education, 2<sup>nd</sup> Edition, 2008.
2. Gerald J. Kowalski and Mark.T. Maybury, "Information Storage and Retrieval systems: Theory and Implementation", Kluwer academic Publishers, 2<sup>nd</sup> Edition, 2000.
3. Peter Jackson, Isabelle Moulinier, "Natural Language Processing for Online Applications", John Benjamins Publishing, 2007.
4. Nitin Indurkha and Fred J. Damerau, "Handbook of Natural Language Processing", 2<sup>nd</sup> Edition, CRC Press, 2010.



## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VIII**

<b>12CS4809</b>	<b>ETHICAL HACKING (ELECTIVE)</b>	L	T	P	C
	(Common to CS & IT)	3	0	0	3

**Objectives:**

- To impart knowledge on foot printing, social engineering, port scanning and vulnerabilities in OS.
- To understand the concepts of hacking web servers, wireless networks, cryptography and security devices.

**UNIT – I                      FUNDAMENTALS OF ETHICAL HACKING                      09 Hrs**

Introduction to Ethical Hacking – Legal and illegal actions on NET – TCP/IP concepts: Overview of TCP/IP, IP addressing and Numbering systems. Networks and Computer attacks: Malware, Protecting against Malware attacks, Intruder attacks, Physical security addressing.

**UNIT – II                      FOOT PRINTING, SOCIAL ENGINEERING & PORT SCANNING                      09 Hrs**

Using web tools for Foot printing – Conducting competitive intelligence – Using DNS zone transfers – introduction: Social engineering, Port scanning – Types of port scans – scanning tools – Conducting Ping sweeps – Shell scripting.

**UNIT – III                      VULNERABILITIES IN OPERATING SYSTEM                      09 Hrs**

Microsoft OS: Tools to identify vulnerabilities on Microsoft systems – Microsoft OS vulnerabilities – Vulnerabilities in Microsoft services – Linux OS: Review of Linux Fundamentals – Linux OS vulnerabilities – Remote access attacks on Linux systems – Countermeasures against Linux remote attacks.

**UNIT – IV                      HACKING WEB SERVERS AND WIRELESS NETWORKS                      09 Hrs**

Web servers: Web applications, web application vulnerabilities – Tools of web attackers and security testers – Wireless networks: wireless technology, Wireless network standards, authentication, wardriving, Wireless hacking.

**UNIT – V                      CRYPTOGRAPHY AND NETWORK PROTECTION                      09 Hrs**

Cryptography: Basics of Cryptography, Symmetric and Asymmetric algorithms – Public Key infrastructure, Cryptography attacks – Protecting networks with security devices: Network security devices, Firewalls, Intrusion Detection Systems and Honeypots.

**Total Hours: 45****Text Books:**

1. Michael T. Simpson, "Ethical Hacking and Network defense", Course Technology, India Edition, 2010.
2. Ankit Fadia, "Ethical Hacking", Macmillan India Ltd, 2<sup>nd</sup> Edition, 2006.

**References:**

1. Steven Defino, Barry Kaufman and Nick Valenteen, "Official Certified Ethical Hacker review guide", Cengage learning, 2012.
2. Ankit Fadia, "The Ethical Hacking Guide to Corporate Security", Macmillan Publishers, 2010.
3. James S. Tiller, "The Ethical Hack: A Framework for Business Value Penetration Testing", CRC Press, 2005.
4. Scambray and Joel, "Hacking Exposed Web Applications", Tata McGraw-Hill, 2011.

**K.S.R. COLLEGE OF ENGINEERING (Autonomous)**

**SEMESTER – VIII**

<b>12CS4810</b>	<b>HIGH SPEED NETWORKS (ELECTIVE)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objectives:**

- To learn the concepts of High Speed Networks : ATM and Frame relay.
- To learn the techniques of real-time traffic, Congestion control and levels of quality of service (QoS) to different applications.

**UNIT – I                      BASICS OF HIGH SPEED NETWORKS                      09 Hrs**

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 – Wireless LAN's, WiFi and WiMax Networks applications, requirements – IEEE 802.11 and Architecture.

**UNIT – II                      CONGESTION AND TRAFFIC MANAGEMENT                      09 Hrs**

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                      09 Hrs**

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                      09 Hrs**

Integrated Services Architecture – Approach, Components, Services- Queuing Discipline – FQ –PS – BRFQ – GPS – WFQ – Random Early Detection – Differentiated Services.

**UNIT – V                      PROTOCOLS FOR QOS SUPPORT                      09 Hrs**

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 Hours: 45**

**Text Books:**

1. William Stallings, "High speed networks and internet", 2<sup>nd</sup> Edition, Pearson Education, 2013.
2. Warland and Pravin Varaiya, "High performance communication networks", 2<sup>nd</sup> Edition, Jean Harcourt Asia Pvt. Ltd., 2008.

**References:**

1. Irvan Pepelnjk, Jim Guichard and Jeff Apar, "MPLS and VPN architecture", Volume 1 & 2, Cisco Press, 2007.
2. James P. G. Sterbenz and Joseph D. Touch, "High-Speed Networking: A Systematic Approach to High-Bandwidth Low-Latency Communication", John Wiley & Sons, 2002.
3. Georg Carle and Martina Zitterbart, "Protocols for High Speed Networks", Springer, 2002.
4. Michael Welzl, "Scalable Performance Signalling and Congestion Avoidance", Springer, 2003.

## K.S.R. COLLEGE OF ENGINEERING (Autonomous)

**SEMESTER – VIII**

<b>12CS4811</b>	<b>BIG DATA ANALYTICS (ELECTIVE)</b>	L	T	P	C
		3	0	0	3

**Objectives:**

- To explore the fundamental concepts of big data analytics.
- To learn the data mining techniques.
- To understand the applications using Map Reduce Concepts.

**UNIT – I FUNDAMENTAL CONCEPTS 09 Hrs**

Big data from business Perspective: Introduction of big data – Characteristics of big data – Data in the warehouse and data in Hadoop – Importance of Big data – Big data Use cases: Patterns for Big data deployment – Big data Market Survey.

**UNIT – II FINDING SIMILAR ITEMS 09 Hrs**

NN Search – Locality – Sensitive Hashing – Distance Measures – Mining Data Streams: Stream Data Model Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements – Estimating Moments – Counting Ones – Decaying Windows.

**UNIT – III LINK ANALYSIS AND CLUSTERING 09 Hrs**

PageRank – Efficient Computation of PageRank – Topic – Sensitive PageRank – Link Spam – Hubs and Authorities – Clustering: Clustering Techniques – Hierarchical Clustering – K-means Algorithms.

**UNIT – IV MAP REDUCE 09 Hrs**

Distributed File Systems – Map-Reduce – Map-Reduce Algorithm Design – Extensions to Map-Reduce – Complexity Theory.

**UNIT – V HADOOP 09 Hrs**

Basics of Hadoop – Starting Hadoop – Components of Hadoop – Writing Map Reduce program – Developing a Map Reduce programs – Application Development in Hadoop.

**Total Hours: 45****Text Books:**

1. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis and Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", Tata McGraw-Hill, 2012.
2. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012.

**References:**

1. Chuck Ium "Hadoop in Action", Manning Publications, 2011.
2. Frank J Ohlhorst, "Big Data Analytics: Turning Big Data into Big Money", Wiley and SAS Business Series, 2012.
3. Colleen Mccue, "Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis", Elsevier, 2007.
4. Michael Berthold and David J. Hand, "Intelligent Data Analysis", Springer, 2007.
5. Edd Dumbill, "Planning for Big Data", 1<sup>st</sup> Edition, O'Reilly Media, 2012.