K.S. Rangasamy College of Technology

(Autonomous Institution)

Curriculum & Syllabus

of

B.Tech. Information Technology

(For the batch admitted in 2017 – 18)

R 2014

Courses Accredited by NBA, Accredited by NAAC with 'B++' Grade,
Approved by AICTE, Affiliated to Anna University, Chennai.

KSR Kalvi Nagar, Tiruchengode – 637 215.
Namakkal District, Tamil Nadu, India.

VISION

To emerge as an Information Technology knowledge hub by imparting quality education, promoting research and innovation.

MISSION

- To provide holistic education through curriculum update, inspired and experiential learning
- To mould the students as responsible professionals to compete with the emerging global challenges

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: **Core Competence**: Graduates will have core competence in engineering fundamentals and computing to solve hardware and software engineering problems

PEO2: **Successful Career:** Graduates will demonstrate successful professional practices in industry, academia and e-governance

PEO3: **Ethics and life-long learning:** Graduates will continue to advance in their career through life-long learning with a social and ethical concern

PROGRAMME SPECIFIC OUTCOMES (PSOs):

Engineering graduates will be able to:

PSO1: **Develop IT infrastructure:** Develop suitable IT infrastructure in diverse domains through acquired foundation skills and knowledge

PSO2: **Design / Develop software products:** Apply necessary tools and methodologies to design and develop software products

PSO3: **Innovative Career:** Create a zest for innovative career path through value-based software courses and entrepreneurial skills resulting in competent IT solution providers

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

PO1: **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: **Design /development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

PO6: **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10:	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11:	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one‘s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12:	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY, TIRUCHENGODE – 637 215	
Curriculum for the Programme under Autonomous Scheme	
Regulation	**R 2014**
Department	**Information Technology**
Programme Code & Name	IT: B.Tech. Information Technology

Semester I

Course Code	Course Name	Hours/ Week			Credit
		L	T	P	C
THEORY					
40 EN 001	English	3	0	0	3
40 MA 001	Ordinary and Partial Differential Equations	3	1	0	4
40 PH 002	Physics of Materials	4	0	0	3
41 CH 007	Environmental Science and Engineering	3	0	0	3
40 ME 001	Basics of Mechanical Engineering	3	0	0	3
40 IT 001	Fundamentals of Information Technology	3	0	0	3
PRACTICAL					
40 PH 0P1	Physics Laboratory	0	0	3	2
40 ME0P2	Engineering Practices Laboratory	0	0	3	2
Total		19	01	06	23

Semester II

Course Code	Course Name	Hours / Week			Credit
		L	T	P	C
THEORY					
40 EN 002	Communication Skills	3	0	0	3
40 MA 002	Laplace Transform and Complex Variables	3	1	0	4
40 CH 001	Engineering Chemistry	3	0	0	3
40 CE 001	Basics of Civil Engineering and Mechanics	3	1	0	4
41 EE 001	Basics of Electrical Engineering	3	0	0	3
40 CS 002	Computer Programming	3	1	0	4
PRACTICAL					
40 CH 0P1	Chemistry Laboratory	0	0	3	2
40 CS 0P2	Computer Programming Laboratory	0	0	3	2
40 ME 0P1	Engineering Graphics Laboratory	0	0	3	2
Total		18	03	09	27

Semester III

THEORY					
40 MA 004	Boundary Value Problems and Transform Methods	3	1	0	4
40 CS 003	Data Structures	3	0	0	3
40 CS 004	Object Oriented Programming	3	0	0	3
40 EC 003	Digital Principles and System Design	3	1	0	4
40 EC 004	Electronic Devices and Circuits	3	0	0	3
40 PH 008	Applied Physics	3	0	0	3
PRACTICAL					
40 CS 0P3	Data Structures Laboratory	0	0	3	2
41 CS 0P4	Object Oriented Programming Laboratory	0	0	3	2
40 EC 0P1	Analog and Digital Circuits Laboratory	0	0	3	2
40 TP 0P1	Career Competency Development I	0	0	2	0
Total		18	02	11	26

Semester IV

THEORY					
40 MA 011	Statistics and Queuing Theory	3	1	0	4
40 IT 401	Computer Architecture	3	0	0	3
40 IT 002	Design and Analysis of Algorithms	3	1	0	4
40 EC 005	Microprocessors and Microcontrollers	3	0	0	3
40 IT 402	Software Engineering	3	0	0	3
40 IT 403	Java Programming	3	0	0	3
PRACTICAL					
40 EC 0P2	Microprocessors and Microcontrollers Laboratory	0	0	3	2
40 IT 4P1	Hardware and Trouble Shooting Laboratory	0	0	3	2
41 IT 4P2	Java Programming Laboratory	0	0	3	2
40 TP 0P2	Career Competency Development II	0	0	2	0
Total		18	02	11	26

K.S.RANGASAMY COLLEGE OF TECHNOLOGY, TIRUCHENGODE – 637 215	
8Curriculum for the Programme under Autonomous Scheme	
Regulation	**R 2014**
Department	**Information Technology**
Programme Code & Name	IT: B.Tech. Information Technology

Semester V

Course Code	Course Name	Hours/ Week			Credit
		L	T	P	C
THEORY					
40 IT 501	Operating Systems	3	0	0	3
40 IT 502	Database Management Systems	3	1	0	4
40 IT 503	Computer Networks	3	0	0	3
40 IT 504	Communication Systems	3	0	0	3
40 IT 505	System Software	3	1	0	4
40 HS 003	Total Quality Management	2	0	0	2
PRACTICAL					
40 IT 5P1	Operating Systems Laboratory	0	0	3	2
40 IT 5P2	Database Management Systems Laboratory	0	0	3	2
40 IT 5P3	Networking Laboratory	0	0	3	2
40 TP 0P3	Career Competency Development III	0	0	2	0
	Total	17	02	11	25

Semester VI

Course Code	Course Name	Hours / Week			Credit
		L	T	P	C
THEORY					
41 IT 602	Web Technology	3	0	0	3
40 IT 603	Data Mining and Analytics	3	0	0	3
40 IT 604	Wireless Technologies	3	0	0	3
40 IT 605	Cryptography and Network Security	3	1	0	4
40 IT 606	Programming Using Python	3	0	0	3
40 IT E1*	Elective I	3	0	0	3
PRACTICAL					
40 IT 6P2	Design Project Laboratory	0	0	3	2
40 IT 6P3	Software Tools Laboratory	0	0	3	2
40 IT 6P4	Python Programming Laboratory	0	0	3	2
40 TP 0P4	Career Competency Development IV	0	0	2	0
	Total	18	01	11	25

Semester VII

THEORY					
40 HS 002	Engineering Economics and Financial Accounting	2	0	0	2
40 IT 701	Service Oriented Architecture	3	0	0	3
40 IT 702	Component Based Technology	3	0	0	3
40 IT 703	Computer Graphics and Multimedia	3	0	0	3
40 IT E2*	Elective II	3	0	0	3
40 IT E3*	Elective III	3	0	0	3
PRACTICAL					
40 IT 7P1	Software Components Laboratory	0	0	3	2
40 IT 7P2	Computer Graphics and Multimedia Laboratory	0	0	3	2
40 IT 7P3	Project Work - Phase I	0	0	3	2
40 TP 0P5	Career Competency Development V	0	0	2	0
Total		17	0	11	23

Semester VIII

THEORY					
41 IT 801	Software Quality Assurance and Testing	3	0	0	3
40 IT E4*	Elective IV	3	0	0	3
40 IT E5*	Elective V	3	0	0	3
PRACTICAL					
40 IT 8P1	Project Work - Phase II	0	0	16	8
Total		9	0	16	17

K.S.Rangasamy College of Technology, Tiruchengode – 637 215									
Curriculum for the Programme under Autonomous Scheme									
Regulation	R 2014								
Department	Information Technology								
Programme Code & Name	IT : B.Tech. Information Technology								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks			
		L	T	P	C	CA	ES	Total	
Elective I									
40 IT E11	High Performance Networks	3	0	0	3	50	50	100	
40 IT E12	Distributed Computing	3	0	0	3	50	50	100	
40 IT E13	Soft Computing	3	0	0	3	50	50	100	
40 IT E14	Software Quality Management	3	0	0	3	50	50	100	
40 IT E15	Database Administration	3	0	0	3	50	50	100	
40 IT E16	Discrete And Numerical Methods	3	0	0	3	50	50	100	
Elective II									
40 HS 001	Professional Ethics	2	0	0	2	50	50	100	
40 IT E21	Wireless Sensor Networks	3	0	0	3	50	50	100	
40 IT E22	Digital Image Processing	3	0	0	3	50	50	100	
40 IT E23	Software Project Management	3	0	0	3	50	50	100	
40 IT E24	Cyber Security and Forensics	3	0	0	3	50	50	100	
40 IT E25	Business Intelligence	3	0	0	3	50	50	100	
Elective III									
40 IT E31	C# and .NET	3	0	0	3	50	50	100	
40 IT E32	Bioinformatics	3	0	0	3	50	50	100	
40 IT E33	Information Retrieval Techniques	3	0	0	3	50	50	100	
40 IT E34	Semantic Web	3	0	0	3	50	50	100	
40 IT E35	Human Computer Interaction	3	0	0	3	50	50	100	
40 IT E36 / 40 IT L05	Mobile Application Development	3	0	0	3	50	50	100	
Elective IV									
40 IT E41	Social Network Analysis	3	0	0	3	50	50	100	
40 IT E42	Open Source Software	3	0	0	3	50	50	100	
40 IT E43	Natural Language Processing	3	0	0	3	50	50	100	
40 IT E44	User Interface Design	3	0	0	3	50	50	100	
40 IT E45	Information Management	3	0	0	3	50	50	100	
40 IT E46	Foundation Skills in Integrated Product Development	3	0	0	3	50	50	100	
Elective V									
40 IT E51/ 40 IT L01	E-Commerce	3	0	0	3	50	50	100	
40 IT E52	Human Rights	3	0	0	3	50	50	100	
40 IT E53	Knowledge Management	3	0	0	3	50	50	100	
40 IT E54	Embedded Systems and Programming	3	0	0	3	50	50	100	
40 IT E55	Fault Tolerant Computing	3	0	0	3	50	50	100	
40 IT E56	Cloud Computing	3	0	0	3	50	50	100	

K.S.Rangasamy College of Technology, Tiruchengode – 637 215								
Curriculum for the Programme under Autonomous Scheme								
Regulation	R 2014							
Department	Information Technology							
Programme Code & Name	IT : B.Tech. Information Technology							
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
Open Electives								
40 IT E51/ 40 IT L01	E-Commerce	3	0	0	3	50	50	100
40 IT L02	Web Design	3	0	0	3	50	50	100
40 IT L03	Python Programming	3	0	0	3	50	50	100
40 IT L04	Multimedia Technologies	3	0	0	3	50	50	100
40 IT E36 / 40 IT L05	Mobile Application Development	3	0	0	3	50	50	100
40 IT L06	Cyber Security	3	0	0	3	50	50	100

K.S.Rangasamy College of Technology – Autonomous								
40 EN 001 – English								
Common to all Branches								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objectives	• To help learners improve their vocabulary and to enable them to use words appropriately in different academic and professional contexts. • To help learners develop strategies that could be adopted while reading texts. • To help learners acquire the ability to speak effectively in English in real life and career related situations. • To train learners in organized academic and professional writing.
Course Outcomes	**At the end of the course, the students will be able to** 1. Comprehend the basic grammatical structures and generate new sentences in a given paradigm. 2. Explain and apply the enriched vocabulary in academic and professional contexts. 3. Identify the main idea and integrate it with supporting data to facilitate effective comprehension. 4. Infer, compare and summarize lexical & contextual meaning of various technical / general passages. 5. Recognize the basic phonetic units of language and execute it for better oral competency. 6. Recognize and interpret standard English Pronunciation & use it in diverse situations. 7. Find and classify different reading strategies and demonstrate better articulation / expression 8. Categorize words into different parts of speech and use them in different contexts. 9. Retrieve information from various sources and construct a well designed descriptive writing. 10. Indentify the key words of concepts and learn to write definitions.

Grammar and Vocabulary

Word formation with Prefixes and Suffixes Level -1 (50 words), Level -2 (100 words) – Synonyms and Antonyms (100 each)– Verbal Analogy- Finding the Odd man out- Alphabet Test- One word substitute- Sentence Patterns- Subject-Verb Agreement – Tenses – Active and Passive voice – Use of conditionals – Comparative Adjectives– Expanding Nominal Compounds (100) – Articles – Use of Prepositions (basic level – 25) Identifying Phrasal Verbs - Error Detection – Abbreviations and Acronyms (100 each).

Suggested Activities

Prefixes and suffixes– identifying the lexical and contextual meanings of words – correction of errors in the given sentences -providing a context for the use of tenses, sentence structures – using comparative forms of adjectives - Identifying phrasal verbs - 'if' clauses – the three main types, probable condition, improbable condition and impossible conditions.

Note: All examples should preferably be related to science and technology.

Listening skill

Extensive listening – Listening for General Content – Listening to fill up Gapped Texts – Intensive Listening – Listening for Specific Information: Retrieval of Factual Information – Listening to Identify Topic, Context, Function, Speaker's Opinion, Attitude, etc. – Global Understanding Skills and Ability to infer, extract gist and understand main ideas – Note-Taking: Guided and Unguided

Suggested Activities

Taking a quick glance at the text to predict the content – reading to identify main content and giving feedback in response to the teacher's questions – making a thesis statement about the text – scanning for specific information – sequencing of jumbled sentences using linguistic clues (e.g. reference words and repetition) and semantic clues following propositional development –fast reading drills – comprehending a passage and answering questions of varied kinds relating to information, inference and prediction.

Speaking skill

Verbal and Non-Verbal communication – Speech Sounds – Syllables – Word Stress (structural and content words) – Sentence Stress – Intonation – Pronunciation Drills, Tongue Twisters – Formal and Informal English – Oral Practice – Developing Confidence – Introducing Oneself – Asking for or Eliciting Information – Describing Objects – Expressing Opinions (agreement / disagreement) – Giving Instructions – (Road Maps)

Suggested Activities

Role play activities based on real life situations – discussing travel plan / industrial visits- giving oral instructions for performing tasks at home and at work (use of imperatives) -using appropriate expressions-defining / describing an object /device / instrument / machine – participating in a short discussion on a controversial topic – oral presentation

Reading skill

Exposure to different reading techniques – Reading for gist and global meaning – Predicting the content – Skimming the text – Identifying the topic sentence and its role in each paragraph – Scanning – Inferring / Identifying lexical and contextual meanings – Reading for structure and detail – Transfer of information / Guided Note-Making – Understanding Discourse Coherence.

Suggested Activities

Gap filling activity while listening to a text – listening intently to identify the missing words in a given text – listening to a brief conversation and answering questions – listening to a discourse and filling up gaps in a worksheet – taking notes during lecture – inferential comprehension and literal comprehension tasks based on listening to quizzes.

Note: The listening activities can be done using a worksheet in the Language Laboratory or in the class room using a tape recorder.

Writing skill

Introduction to the characteristics of technical style – Writing Definitions and Descriptions – Paragraph Writing (topic sentence and its role, unity, coherence and use of cohesive expressions) – Process Description (use of sequencing connectives) – Comparison and Contrast – Classifying the Data – Analyzing / Interpreting the data – Formal letter Writing (letter to the editor, letter for seeking practical training, and letter for undertaking project works in industries) – Editing (punctuation, spelling and grammar)

Suggested Activities

writing a paragraph based on information provided in a tree diagram / flow chart / bar chart / pie chart / tables – formal letters – writing to officials (leave letter, seeking permission for practical training , asking for certificates, testimonials) – letter to the editor – informal letters (persuading / dissuading, thanking and congratulating friends / relatives) – sending e- mail – editing a passage (correcting the mistakes in punctuation, spelling and grammar)

Text book(s) :

1.	Ashraf M Rizvi, 'Effective Technical Communication', 1st Edition, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2005.

Reference(s) :

1.	M.Balasubramanian and G.Anbalagan, 'Performance in English', Anuradha Publications, Kumbakonam, 2007.
2.	Sharon J. Gerson, Steven M. Gerson, 'Technical Writing – Process & Product',3rd Edition, Pearson Education (Singapore) (p) Ltd., New Delhi, 2004.
3.	Mitra K. Barun, 'Effective Technical Communication – A Guide for Scientists and Engineers', Oxford University Press, New Delhi, 2006.
4.	R.S. Aggarwal, 'A Modern Approach to Verbal & Non – Verbal Reasoning', S.Chand & Company Ltd., New Delhi, Revised Edition, 2012.
5.	NPTEL Video Courses on Spoken English.

K.S.Rangasamy College of Technology - Autonomous

40 MA 001 Ordinary and Partial Differential Equations

Common to all Branches

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	1	0	60	4	50	50	100

Objectives

- To present methods of solving system of linear equations.
- To develop the mathematical skills for solving ordinary and partial differential equations.
- To acquire knowledge about the concept of vectors in two-dimensional and three dimensional spaces.

Course Outcomes

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

1. (i) Understand the types of matrix and find eigen values, eigen vectors and inverse of the matrix. (ii) Solve the system of linear equations.
2. Apply transformation techniques to reduce quadratic form into canonical form.
3. Solve linear differential equations with constant and variable coefficients.
4. (i) Find the solution of differential equations by the method of variation of parameters. (ii) Solve simultaneous differential equations.
5. Understand the concepts of curvature and evolutes.
6. (i) Analyze the maxima and minima of a function
   (ii) Expand the function of two variables as Taylor's series and find the Jacobians.
7. Construct partial differential equations and find the solutions of non-linear partial differential equations of first order.
8. Apply the appropriate method to solve Lagrange's linear equations and solve linear partial differential equations with constant coefficients.
9. Know about gradient, directional derivative, solenoidal and irrotational of a vector function.
10. Apply the notions of vector calculus to verify Green's, Gauss divergence and Stoke's theorems.

Matrices

Basic concepts – Addition and multiplication of matrices – Orthogonal matrices – Conjugate of a matrix – Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values and Eigen vectors – Cayley-Hamilton theorem (without proof) – Orthogonal transformation of a symmetric matrix to diagonal form – Reduction of quadratic form to canonical form by orthogonal transformation – System of linear equations.

Ordinary Differential Equations

Introduction – Differential equations of first-order and first degree – Exact differential equations – Linear differential equations of second and higher order with constant co-efficient when the R.H.S is $e^{\alpha x}$, $\sin \alpha x$ or $\cos \alpha x$,x^n n>0, $e^{\alpha x} x^n$, $e^{\alpha x} \sin\beta x$, and $e^{\alpha x} \cos\beta x$ – Differential equations with variable co-efficients reducible to differential equations with constant co-efficients (Cauchy's form and Legendre's linear equation) – Method of variation of parameters – Simultaneous first-order linear equations with constant co-efficients.

Differential Calculus and Functions of Several Variables

Curvature – Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Involutes and evolutes – Taylor's series for a function of two variables – Maxima and minima of function of two variables – Constrained maxima and minima (Lagrange's method of undetermined multipliers) – Jacobians(Problems only).

Partial Differential Equations

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Non-linear partial differential equations of first order (Type I – IV) – Solution of partial differential equations of first order – Lagrange's linear equations – Linear partial differential equations with constant coefficients.

Vector Calculus

Introduction – Gradient of a scalar point function – Directional derivative – Angle of intersection of two surfaces – Divergence and curl(excluding identities) – Solenoidal and irrotational vectors – Green's theorem in the plane – Gauss divergence theorem – Stoke's theorem(without proof) – Verification of the above theorems and evaluation of integrals using them.

Text book(s) :

1. Kreyszig E, "Advanced Engineering Mathematics", 9th Edition, John Wiley and Sons (Asia) Limited, New Delhi, Reprint 2012.

Reference(s) :

1. Grewal B.S, "Higher Engineering Mathematics", 43rd Edition, Khanna Publishers, Delhi, 2013.
2. Bali N.P and Manish Goyal, "A Text book of Engineering Mathematics", 9th Edition, Lakshmi Publications Pvt Ltd, New Delhi, 2014.

K.S.Rangasamy College of Technology – Autonomous								
40 PH 002 Physics of Materials								
Common to CSE & IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objectives	• To impart fundamental knowledge about conducting, superconducting, semiconducting, magnetic, advanced materials &devices and IC fabrication technology. • To correlate the theoretical principles with application oriented studies.
Course outcomes	**At the end of the course, the students will be able to** 1. Recognize the electrical and thermal conductivity to analyze the properties of electrons in metals. 2. Recall superconductivity to understand the properties, the classification and the applications of superconducting devices. 3. Recall the fundamental concept of semiconductors and classify them based on structural arrangements, deduce the semiconductor parameters 4. Recognize Hall effect and employ Hall experiment to discriminate the semiconductor types 5. Classify magnetic materials based on their properties 6. Employ magnetic materials to act as data storage devices 7. Understand and apply the properties of metallic glasses, SMA, MEMS for research and industrial applications 8. Understand the properties and prepration of nanomaterials and its impact in research and industrial applications. 9. Recognize IC terminologies and classify different Ics 10. Analyze the advantages and disadvantages of Ics and apply fabrication techniques of IC components for research and industrial applications.

Conducting, Superconducting Materials and Devices

Introduction-Classical Free electron theory-verification of Ohm's law –Electrical Conductivity- Expression for electrical conductivity-Thermal conductivity-Expression for thermal Conductivity-Widemann Franz Law- Lorentz number - Advantages and drawbacks of classical free electron theory- superconductivity-Properties of Superconductors-Factors affecting superconducting phenomena – DC and AC Josephson effect –BCS theory-Type-I and Type-II superconductors-High T_C Superconductors-Applications: SQUID, Cryotron, Magnetic Levitation

Semiconducting Materials and Devices

Introduction-properties-Elemental and Compound Semiconductors-Intrinsic and Extrinsic Semiconductors-Properties-Carrier Concentration in intrinsic and Extrinsic semiconductors- electrical conductivity of a semiconductor- determination of band gap-Relation between electrical conductivity and mobility- Variation of Fermi level with Temperature and impurities-Hall effect- Hall Coefficient-Experimental Determination of Hall Coefficient-applications-Semiconductor devices :LDR, Solar Cells

Magnetic Materials and Devices

Introduction-Classification of Magnetic materials-properties-Domain theory of ferromagnetism-Hystersis-Hard and Soft magnetic materials-Ferrites: Structure, preparation and applications-Applications: Charge coupled devices(CCD) -Optical and magnetic data storage

Advanced Materials

Metallic glasses: preparation, properties and applications – Shape memory alloys (SMA):Characteristics, properties of NiTi alloy, application: MEMS – Nanomaterials- Properties- Top-down process: Ball Milling method – Bottom-up process: Vapour Phase Deposition method- Carbon Nano Tube(CNT): Properties, Electric arc method, Applications

IC Fabrication

Introduction-Advantages and Drawbacks of Ics-Scale of Integration- Classification between different Ics- Linear Integrated Circuit-Digital Integrated Circuit- IC Terminologies-Monolithic IC fabrication – Fabrication of IC components-Applications of Ics

Text Book(s) :

1.	Rajendran V, "Engineering Physics", TataMcGraw Hill, New Delhi, 2011
2.	William D.Callister, "Material Science and Engineering," Wiley India, 2006

Reference(s) :

1.	B.L.Theraja, "Basic Electronics", S. Chand publications, New Dehli-2007
2.	R.S.Sedha, "Applied Electronics" S. Chand Publications, New Dehli-2010
3.	V.K.Metha, Rohit Metha "Principles of Electronics", S,Chand & company Ltd, New Delhi, 2010

K.S. Rangasamy College of Technology - Autonomous								
41 CH 007 Environmental Science and Engineering								
Common to all Branches								
Semester	Hours / Week			Total hrs	Credit	Maximum marks		
	L	T	P	45	C	CA	ES	Total
I	3	0	0		3	50	50	100

Objectives	• To help the learners to analyze the importance of ecosystem and biodiversity. • To familiarize the learners with the impacts of pollution, control and legislation. • To enlighten the learners about waste and disaster management. • To endow with an overview of food resources and human health. • To enlighten awareness and recognize the social responsibility in environmental issues.
Course Outcomes	**At the end of the course, the students will be able to** 1. Recognize the concepts and issues related to environment and ecosystem. 2. Assess the importance of biodiversity 3. Analyze the source, effects, and control measures of pollution. 4. Imbibe the applications of Laws of environmental protection. 5. Appraise the methods of solid waste management. 6. Increase the awareness of disaster management and preparedness. 7. Instill the awareness on the impacts of food resources and its related problems. 8. Evaluate the problems related to population explosion and its related health issues. 9. Analyze the value of sustainable development. 10. Identify the issues related to environmental issues and civic responsibilities.

Environmental Studies, Ecosystem and Biodiversity

Environment - Segment - Environmental studies - Scope and multidisciplinary nature - Need for public awareness - Environmental ethics- Ecosystem - Structure and function - Ecological succession. Biodiversity - Values of biodiversity - Endangered and endemic species - Hot spots - India a mega biodiversity nation - Threats - Impact of biodiversity loss - Conservation - In-situ and ex-situ - Case studies.

Environmental Pollution and Legislation

Pollution - Sources, effects and control measures - Air, water, soil, noise, thermal, nuclear and marine - Major polluting industries of India - Land degradation - Impacts of mining. Environmental legislation in India- Environment protection act - Air pollution, water pollution, wildlife protection and forest conservation - Case studies.

Waste and Disaster Management

Waste - Solid waste - Sources, effects and control measures - Management techniques - e-waste - Effluent water treatment - Radioactive waste and disposal methods. Disaster management - Earth quakes - Landslides - Floods - Cyclones - Tsunami - Disaster preparedness - Response and recovery from a disaster - Disaster management in India - Case studies.

Food Resources, Human Population and Health

World food problems - Over grazing and desertification - Effects of modern agriculture - Fertilizer – Pesticide - Problems, water logging and salinity. Population - Population growth and explosion - Population variation among nations. Human rights - Value education - Women and child welfare - HIV/AIDS - Role of IT in environment and human health - Case studies.

Social Issues and the Environment

Unsustainable to sustainable development - Use of alternate energy sources - Energy Conversion processes - Biogas - Anaerobic digestion - Production and uses - Water conservation - Rain water harvesting - Water shed

Text book(s) :

1. Tyler miller. G, “Environmental Science”, 13th Edition Cengage Publications, Delhi, 2013.

Reference(s) :

1. Gilbert M.Masters and Wendell P. Ela,”Environmental Engineering and Science”, Phi learning private limited, New Delhi, 3rd Edition, 2013. Learning private limited, New Delhi, 3rd Edition, 2013.
2. Rajagopalan. R, “Environmental Studies” Oxford University Press, New Delhi, 2nd Edition, 2012.
3. Deeksha Dave and Katewa. S.S, “Environmental Studies” 2nd Edition, Cengage Publications, Delhi, 2013.

K.S.Rangasamy College of Technology – Autonomous

40 ME 001 Basics of Mechanical Engineering

Common to EC, CS, IT & NST

Semester	Hours / Week			Total Hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objectives	• To impart knowledge on power plants, thermodynamics, heat transfer, IC engines, refrigeration and air-conditioning
Course Outcomes	At the end of the course, the student will be able to: 1. Discuss on types of Fossil fuels and their use for power generation. 2. Discuss on renewable sources of energy and their application for power generation. 3. State the laws of thermodynamics and applied to open thermodynamic system. 4. Apply the second law of thermodynamics to heat engines and heat pumps. 5. Explain the modes of heat transfer. 6. Apply the principles of conduction in solving heat transfer problems 7. Explain the operation of Internal Combustion engine. 8. Describe fuel supply and injection system in an internal combustion engine. 9. Explain the components of refrigeration systems and its operation. 10. Demonstrate the principle of operation of air-conditioning systems.

Sources of Energy and Power Plants

Introduction – Energy- Classification of Energy Sources - Conventional Energy Sources: Working principle of Thermal, Gas, Diesel, Hydro-electric and Nuclear power plants. Non - Conventional Energy Sources: working principle of Solar, Wind, Tidal and Geothermal power plants.

Thermodynamics – Laws and Entropy

Basic concepts – Thermodynamic systems – Laws of Thermodynamics: Zeroth law of Thermodynamics, First law of thermodynamics - Steady Flow Energy Equation – Application of SFEE to nozzle, boiler, turbine and compressor (simple problems). Second law of Thermodynamics – cyclic heat engine, heat pump, Carnot cycle (simple problems), Entropy.

Heat Transfer

Introduction – Modes of Heat Transfer: Conduction, Convection and Radiation – Laws of Conduction - Types of Convection – Laws of Radiation – Radiation Shields - Fourier law of heat conduction in simple and composite wall geometrics, types of boundary and initial conditions – Fins: types – fin efficiency (simple problems).

Internal Combustion Engines

Introduction - working principle of petrol and diesel engines - two and four stroke cycle engines – Comparison of two and four stroke engine – Fuel supply system – Ignition system – Calculation of Mechanical and Brake thermal efficiency - Layout of Automobile Vehicle.

Refrigeration

Introduction – Terminology of Refrigeration and Air conditioning systems – working principle of vapour compression and absorption system – Layout of typical domestic refrigerator,

Air-Conditioning

Introduction – Types of Air conditioner: Window, Split and Central air conditioners – Calculation of CoP (simple problems).

Text Book(s) :

1. Pravin Kumar, “Basic Mechanical Engineering”, 1st Edition, Pearson India Education Services Pvt. Ltd, Chennai, 2014.

Reference(s) :

1. Arora, S. C., Domkundwar.S., “A Course in Power Plant Engineering”, Dhanpat rai & Co., New Delhi, 2014.
2. Cengel, YA and Boles, M.A, “Thermodynamics: An Engineering Approach”, Mc Graw-Hill; 4th edition ,2002.
3. Yunus A.Cengel, “ Heat Transfer: A Practical Approach”, Mc graw-Hill, 2nd edition, 2002.
4. V.Ganesan ,“Internal Combustion Engines”, Tata Mc Graw-Hill Education, 2002.
5. Arora.C.P., “Refrigeration and Airconditioning”, 3rd Edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2008.

K.S.Rangasamy College of Technology - Autonomous

40 IT 001 Fundamentals of Information Technology

Common to CS & IT

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objectives

- To enable students to learn basic concepts of Information Technology and its applications.
- To explain technological outlook in social, economic, and political context.
- To introduce cutting-edge technologies and trends in the areas of wireless multimedia, digital audio and computer networking.

Course Outcomes

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

1. Outline the basics of Information Technology and digital domain.
2. Explain mathematical techniques to manipulate number systems.
3. Explore the fundamental components of computer and its storage technologies.
4. Describe the stages of software development process and programming paradigms.
5. Select the digital audio technologies for creating, digitizing and compressing the sound waves.
6. Identify the technical processes of producing digital images and videos.
7. Classify the types of networks.
8. Examine the Internet Architecture and articulate unique economic and social issues that accompanied the Internet evolutions.
9. Realize the traditional telephone systems architecture, VoIP and Wireless multimedia systems.
10. Infer the multimedia access devices and identify the transform of information access.

Introduction to Information Technology

Information Technology Introduction - The Information Era - Defining Information Technology –Information Technology in Society-The State of IT Careers- Emergence of the Digital Age-The Difference between Analog and Digital Representations of Information-Manipulating Bits-Advantages of Digital Technology – The Binary Numbering System –Alternative Numbering Systems – Representing Text and other Characters in Binary.

Fundamentals of Computers

Introduction - A brief History of Computer - Digital Logic-Fundamental Components of a Computer- Factors That Affect Computer Performance-Inside a Typical Computer-Types of Computers and Their Applications-Storage Technologies - Software – Programming Languages – Types of Software – The Software Development Process – Open Source Software.

Digital Multimedia

Introduction – Background-Digitizing Sound – Digital Audio Compression – Imaging Technologies – Digitizing Images and Video – Digital Image and Video Formats – Display Technologies.

Computer Networking

Introduction- Defining LANs – LAN Design Characteristics – The Evolution of LAN Types - WAN Background - WAN Alternatives – WAN Access Alternatives – Network Management Systems – Internet History – Internet Architectural Components – Internet Applications – Internet Administration - Internet Open Issues – Case Project.

Internet and Wireless Multimedia

Introduction—Historical Background – Public Switched Telephone Network – Telecommunications Principles – Future of the Telephone System– VoIP Protocols – Implementation Options – Internet Telephony Benefits – Internet Telephony Challenges – Public Policy Issues - Wireless Multimedia Devices-The Bluetooth Standard-Cellular Technology-Wi-Fi, WiMAX, and Cellular Integration.

Text book(s):

1. Pelin Aksoy , Laura Denardis,"Information Technology in Theory", Cengage Learning India Private Limited, Reprint 2012.

Reference(s):

1. Turban,Rainer,Potter, "Introduction to Information Technology", WSE Wiley, Reprint 2014.

K.S.Rangasamy College of Technology – Autonomous								
40 PH 0P1 Physics Laboratory								
Common for ME, MC, IT, CE, TT, BT & NST								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	0	0	3	45	2	50	50	100

Objectives	• To give exposure for understanding the various physical phenomena in mechanics, optics, materials science and properties of matter. • To correlate the theoretical principles with application oriented studies.
Course Outcomes	**At the end of the course, the student will be able to** 1. Know the concept of parameters, such as stress, strain and elastic limit needed to achieve a given amount of deformation in the given material. (1- 3) 2. Grasp the knowledge of dependency of viscosity of a liquid on its density and velocity of liquid motion (4) 3. Imbibe the property of surface tension and capillarity action in fluid dynamics, which are due to the pressure of cohesion and adhesion that causes the liquid to work against gravity (5) 4. Understand the phenomenon of interference of light between the two reflected lights from a flat (glass plate) and spherical surfaces (Plano-convex lens) that produces puddles of Newton's rings, the application of which is an accurate measure of the size of any hollows and heights on a surface by counting the rings and knowing the wavelength of the illumination (6) 5. Comprehend the diffraction property of light through a spectrometer grating element which yields the wavelength of mercury spectral lines (7) 6. Know the concept of interference of light between two reflected lights from a thin air wedge.(8) 7. Understand the concept of a wave encountering an obstacle (particle) that is comparable in size to its wavelength, undergoing scattering (diffraction) by particles and to apply it find the wavelength of light and the particle size. (9) 8. Apply the knowledge of semiconductor thin films in conversion of optical energy into electrical energy, the application being the photovoltaic solar cells employed as one of the potential and perennial renewable energy source (10)

S. No.	**List of Experiments**
1.	Determination of Young's modulus of a steel bar by uniform bending method.
2.	Determination of Young's modulus of a cantilever (Pin & Microscope method).
3.	Determination of rigidity modulus of a wire by torsional pendulum.
4.	Comparison of co-efficient of viscosity of two different liquids by Poiseuille's method.
5.	Comparison of surface tension of two different liquids by capillary rise method.
6.	Determination of radius of curvature of a plano convex lens using Newton's rings.
7.	Determination of wavelength of mercury spectral lines using spectrometer grating element.
8.	Determination of thickness of a fiber by air wedge.
9.	Determination of wavelength of laser and particle size.
10.	V-I characteristics of Solar cell.

Lab Manual :

"1. Physics Lab Manual", Department of Physics, KSRCT.

K.S.Rangasamy College of Technology – Autonomous

40 ME 0P2 Engineering Practices Laboratory

Common to ME, EE, CS, IT, EI & NST

Semester	Hours / Week			Total Hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	0	0	3	45	2	50	50	100

Objectives	• To provide exposure to the students with hands on experience on various basic engineering practices in Mechanical Engineering
Course Outcomes	At the end of the course, the student will be able to: 1. Make a model of fitting like Square and V fitting using fitting tools 2. Make a model of carpentry like Dovetail joint, and cross lap joint using carpentry tools 3. Fabricate the models of sheet metal in sheet metal shop. 4. Prepare joints by arc welding 5. Construct electrical wiring circuit and demonstrate in electrical wiring section 6. Construct the water pipe line in plumbing shop

Fitting

Safety aspects in Fitting, Study of tools and equipments, Preparation of models- Filing, Square, Vee.

Carpentry

Safety aspects in Carpentry, Study of tools and equipments, Preparation of models- Planning, Dove tail, Cross Lap.

Sheet Metal

Safety aspects in Sheet metal, Study of tools and equipments, Preparation of models- Scoope, Cone, Tray.

Welding

Safety aspects of welding, Study of arc welding equipments, Preparation of models -Lap, butt, T-joints. Study of Gas Welding and Equipments.

Electrical Wiring And Plumbing

Safety aspects of Electrical wiring, Study of Electrical Materials and wiring components, Wiring circuit for a lamp using single and stair case switches. Wiring circuit for fluorescent lamps, wiring circuit for 3 phase motor. Study of plumbing tools, assembly of G.I. pipes/ PVC and pipe fittings, Cutting of threads in G.I.Pipes/PVC by thread cutting dies.

Lab Manual :

1. “Engineering Practices Lab Manual”, Department of Mechanical Engineering, KSRCT.

K.S.Rangasamy College of Technology – Autonomous

40 EN 002 Communication Skills

Common to all Branches

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	3	0	0	45	3	50	50	100

Objectives	• To equip students with effective speaking and listening skills in English. • To help them develop soft skills and people skills which will make them excel in their jobs. • To enhance students' performance in placement interviews.
Course Outcomes	**At the end of the course, the student will be able to:** 1. Look for specific details and overcome speech barriers. 2. Pick key points by listening and improve casual conversational skills. 3. Understand different forms of communication with differences among them. 4. Know about formal speech and descriptive techniques, and use specific words in specific contexts. 5. Fine tune language for different conversational contexts and purposes. 6. Learn telephone etiquette by using language for assent and dissent. 7. Understand grammatical structures, its technical aspects and usage 8. Use discourse markers, enhance punctuation and learn discourse coherence 9. Comprehend content, generate different forms of template and enhance reference skills 10. Construct well-knit documents for job readiness and career competence

The Listening Process

Barriers in Listening - Listening to academic lectures - Listening to announcements at railway stations, airports, etc - Listening to news on the radio / TV - Listening to casual conversation - Listening to live speech

Suggested activities

Listening to casual conversations, talks, interviews, lectures, specific information relating to technical content, statistical information, retrieving information, gapped texts-listening comprehension through video clippings and lectures.

Nature of Communication

Stages of communication–Channels of communication- Barriers to effective communication - Differences between spoken and written communication - Giving directions - Art of small talk-presentation skills - Taking part in casual conversation - Making a short formal speech-Describing people, place, and events.

Suggested activities

Motivating and conducting prepared speech – debate on topics of interest **-** conversation (dialogue based on particular situation by using pleasantries) – extempore - picture description (people, place, things and events)

Telephonic Conversational Skill

Using the telephone - Greeting and introduction - Making requests - Asking for permission, Giving / Denying permission - Giving information on the phone – Leaving messages on Answer Machines - Making / changing appointments - Making complaints – Reminding - Listening and Taking messages - Giving instructions & Responding to instructions

Suggested activities

Familiarizing the telephone etiquette and telephone jargon – use of role play cards – conversational practices – games for spelling out proper nouns, long words, numbers, etc., -- useful phrases for complaints or making appointments – providing the needed vocabulary and expressions for agreeing and disagreeing – video clippings of speeches to drill note taking – providing context for framing yes or no questions for making requests.

Remedial Grammar

Tenses - 'Do' forms – Impersonal Passive voice - Imperatives – using should form – Direct, Indirect speech – Discourse markers – SI Units - Numerical adjectives – Prepositions (intermediate level) - Phrasal verbs (usage)- Correct use of words - Use of formal words in informal situations - Commonly confused words – Editing.

Suggested activities

Providing various contexts to fill tense gaps (stories , demos, future plans etc.,) Technical context for impersonal passive structures – transformation drills for imperatives – elucidating suggestion and recommendation formats – contextual frames for preposition and phrasal verbs – editing exercises – standard paradigm for negative structures – use of SI units (25 common units to be taught) numerical adjectives in various contexts – providing examples and drill units for commonly confused words-exemplifying the structures for direct and indirect speech – monitoring the drill units for conversion of direct to indirect, imperatives to recommendations and vice versa – reinforcing skills for discourse markers.

Written Communication & Career Skills

Writing e-mails - Writing Reports – Lab Reports - Preparing Curriculum Vitae and cover letters - Facing an Interview - Flow Charts, Interpreting the data from Tables– Recommendations – Check List – Slide Preparation –Theme Detection – Deriving Conclusions from the passages – Situation Reaction Test – Statements - Conclusions-Statement and Courses of Action

Suggested activities

Deliberating the content, format and diction for drafting e-mails -- elucidating the structure and content for writing reports especially Accident and Lab Reports -- mentoring strategy to construe the difference between Résumé and CV , and preparing the wards for the recruitment -- building self confidence in facing an interview with flawless presentation and persuasion skills -- reinforcing the interpretative skills of transcoding flow charts and Tables by employing appropriate discourse markers -- inculcating the language and format of writing Recommendations and Checklists -- enforcing innovatively the Reasoning and Logical Detection in Verbal Ability for the effective equipment of grooming for the primary leg of the recruitment process.

Text book(s) :

1.	Ashraf M Rizvi, 'Effective Technical Communication', 1st Edition, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2005.

Reference(s) :

1.	P.Kiranmai Dutt, Geetha Rajeevan and CLN.Prakash, 'A Course in Communication Skills', by Ebek – Cambridge University Press India Pvt. Ltd., 2008.
2.	B. Jean Naterop, 'Telephoning in English' – Cambridge University Press India Pvt.Ltd., 2007.
3.	Jack. C. Richards, 'New Interchange Services (Student's Book)' – Introduction, Level – 1, Level – 2, Level – 3, Cambridge University Press India Pvt.Ltd., 2007.
4.	R.S. Aggarwal, 'A Modern Approach to Verbal & Non – Verbal Reasoning',S.Chand & Company Ltd., New Delhi, Revised Edition, 2012.
5.	NPTEL Video Courses on Communication Skills.

K.S.Rangasamy College of Technology - Autonomous								
40 MA 002 Laplace Transform and Complex Variables								
Common to ME, CE, MC, EE, EI, CS, IT, TT, BT & NST								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	3	1	0	60	4	50	50	100

Objectives	• To formulate and solve problems involving volume and surface area using multiple integrals • To give an ability to apply Laplace transform technique for solving engineering problems • To provide an overview of functions of complex variables and complex integration which helps in solving many complex problems • To identify the properties of coplanar and solid geometric shapes and use these properties to solve common applications
Course Outcomes	**At the end of the course, the students will be able to** 1. (i) Apply double integral to find area between two curves. (ii) Evaluate double integral by changing the order of integration and triple integral. 2. Study the concepts of Beta and Gamma functions. 3. Understand the concepts of Laplace transforms for some elementary functions, some special functions, periodic functions, derivatives and integrals. 4. Apply the techniques of inverse Laplace transform to solve linear ordinary differential equation and simultaneous differential equations. 5. Know about the construction of analytic and conjugate harmonic functions and their properties. 6. Employ conformal maps to determine images of curves and find the bilinear transformation. 7. Expand the functions as Taylor's and Laurent's series and evaluate the complex integrals. 8. Evaluate real definite integrals with suitable contours using Cauchy's residue theorem. 9. Understand the notions of plane, straight line and skew lines. 10. Relate the concepts between tangent planes and spheres.

Multiple Integrals

Double integration – Cartesian and polar coordinates – Change of order of integration – Area between two curves – Area as double integral – Triple integration in Cartesian coordinates.

Beta and Gamma functions**:** Relationship between Beta and Gamma functions – Properties – Problems.

Laplace Transform

Laplace transform – Conditions for existence – Transform of elementary functions – Basic properties – Derivatives and integrals of transforms – Initial and final value theorem – Transform of unit step function – Dirac's delta function – Transform of periodic functions. Inverse Laplace transform – Convolution theorem – Solution of linear ordinary differential equation with constant co-efficients – First order simultaneous equations with constant co-efficients.

Complex Variables

Functions of a complex variable – Analytic functions – Necessary conditions (Cauchy–Riemann equations) – Sufficient conditions (excluding proof) – Properties of analytic functions – Harmonic function – Conjugate harmonic functions– Construction of analytic functions– Conformal mapping: w = z + a, az, 1/z and bilinear transformation.

Complex Integration

Cauchy's Integral theorem (without proof) – Cauchy's integral formula – Taylor and Laurent series (without proof) – Classification of singularities – Cauchy's residue theorem – Contour integration – Circular and semi-circular contours (excluding poles on real axis).

Solid Geometry

Direction cosines – Plane – Straight lines – Coplanar – Point of intersection – Skew lines – Sphere – Tangent plane – Great circle – Orthogonal sphere.

Text book(s) :

1.	Kreyszig E, "Advanced Engineering Mathematics", 9th Edition, John Wiley and Sons (Asia) Limited, New Delhi, Reprint 2012.

Reference(s) :

1.	Grewal B.S, "Higher Engineering Mathematics", 43rd Edition, Khanna Publishers, Delhi, 2013.
2.	Bali N.P and Manish Goyal, "A Text book of Engineering Mathematics", 9th Edition, Lakshmi Publications Pvt Ltd, New Delhi, 2014.

K.S. Rangasamy College of Technology - Autonomous

40 CH 001 Engineering Chemistry

Common to EE, EC, CS, EI & IT

Semester	Hours / Week			Total hrs	Credit	Maximum marks		
	L	T	P	45	C	CA	ES	Total
II	3	0	0		3	50	50	100

Objectives

- To help the learners to analyze the hardness of water and its removal.
- To familiarize the learners with the basics of electrochemistry, its applications,
- corrosion and its control.
- To endow with an overview of batteries and fuel cells.
- To impart the knowledge of photochemistry and its applications.
- To enlighten the learners on polymers.

Course Outcomes

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

1. Recognize sources of water, quality parameter and hardness of water.
2. Analyze and appraise methods to overcome hardness.
3. Relate the basic tenets of electrochemistry to arrive at mathematical expression and outline its various applications.
4. Identify the types, mechanism, and factors influencing corrosion and describe its control measures.
5. Analyze the principle and applications of batteries.
6. Apply the knowledge of electro chemistry in fuel cells and working principle of solar battery.
7. Recall the laws of photochemistry and infer their applications.
8. Analyze the principle and applications of colorimeter and UV-VIS spectrophotometer.
9. Explain the basic concepts, characteristics of polymer and mechanisms of polymerization.
10. Discuss the preparation, properties and uses of select polymers.

Water Treatment

Sources of water and its properties – Water quality parameter (EPA) – Hard and soft water – Hardness of water – Types – Units of hardness – ppm and mg/L – Estimation of hardness - EDTA method – Boiler feed water – Boiler problems – Internal treatment – Carbonate, Phosphate and Calgon conditioning. External treatment – Zeolite and deionization process – Desalination – Reverse osmosis and Electro dialysis.

Electrochemistry and Corrosion

Basics of electrochemistry – Reversible and irreversible cells – Nernst equation (problems) – EMF – measurement – EMF series – Applications – Types of electrodes – Reference electrodes – Conductometric titration. Corrosion – Types – Galvanic and differential aeration corrosion – Mechanism (Dry and wet) – Factors influencing corrosion – Corrosion control – Cathodic protection – Corrosion inhibitors. Electroplating of nickel and chromium.

Batteries and Fuel Cells

Batteries – Characteristics – Primary and secondary batteries – Principle – Working – Charging and discharging – Applications of Laclanche cell – Alkaline battery – NICAD battery – Lithium battery – Lead acid battery – Nickel-metal hydride battery. Fuel cells – Types – Hydrogen – Oxygen fuel cell, PEFC and SOFC – Principle, operation and uses – Construction and applications of solar battery.

Photochemistry and Instrumental Methods of Analysis

Photochemistry – Lambert's law – Beer's Law – Quantum efficiency – Applications of photo chemistry – Photo electric effect – Definition – Jablonski diagram – Fluorescence – Phosphorescence – Chemiluminescence. Colorimeter and UV-Visible spectrophotometer – Principle, instrumentation and applications (Block diagram only).

Polymers

Introduction – Types of polymerization – Mechanism of polymerization – Free radical polymerization – Co-ordination polymerization – Properties of polymers – Tg, tacticity and degradation of polymers – Plastics – Thermo and thermosetting – Preparation, properties and uses of PE, PVC, PTFE, PMMA, epoxy resin, nylon 6,6 and bakelite. Basic materials and properties of LCD and LED.

Text book(s) :

1. Vairam S "Engineering Chemistry", Wiley India, Delhi, 2nd Edition, 2013.

Reference(s) :

1. Dara.S.S. 'A Text Book of Engineering Chemistry', S Chand & Co.Ltd., 2003
2. Bill Mayer F. W., 'Text Book of Polymer Science ', Wiley - New York, 3rd Edition, 1991.
3. Jain and Jain, Engineering Chemistry, Dhanpat Rai Publishing Company Pvt. Ltd., Delhi.15th Edition, 2008.

K.S.Rangasamy College of Technology - Autonomous								
40 CE 001 Basics of Civil Engineering and Mechanics								
Common to EE, CS, IT, EI & NST								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	3	1	0	60	4	50	50	100

Objectives	• To impart the fundamental knowledge about building materials and building component • To study the basics of engineering mechanics which includes statics, dynamics and properties of surfaces and solids
Course Outcomes	**At the end of the course, the student will be able to:** 1. Identify the construction materials required and describe its uses. 2. Discuss the objectives and types of surveying 3. Identify the components of substructure of a building 4. Identify the components of superstructure of a building 5. Apply the laws of mechanics 6. Illustrate the free body diagram of a system; determine the forces and various moments and couples 7. Compute the centroid and first moment of area of various sections 8. Apply the parallel and perpendicular axis theorem to find out the moment of inertia of various sections 9. Calculate the displacement, velocity and acceleration of particles 10. Analyse the relative motion and types of friction.

Introduction and Civil Engineering Materials

Introduction – Construction Materials – Classification – Uses –Requirements: - Bricks-Stone – Cement – Sand – Concrete – Steel Sections, Surveying – Objectives and Types.

Building Components

Components: – Selection of site for building- Substructure- Bearing capacity of soil - Requirement of good foundation– Types of foundation- Superstructure– Technical terms: - Types – Brick masonry – Stone masonry.

Statics of Particles

Introduction to Mechanics - Laws of Mechanics – Lame's theorem - Parallelogram law of forces-system of forces - Free body diagram - Moment and Couples - Moment of force about a point and axis - Types of support and reaction.

Properties of Surfaces and Solids

Determination of areas – First moment of area and the centroid of section - Second moment of area - Rectangle, circle, triangle by integration – T section, I section and angle section by using standard formula - Parallel axis theorem and Perpendicular axis theorem.

Dynamics of Particles

Displacement, Velocity, Acceleration and their relationship - Relative motion – Frictional forces - Simple contact friction - Ladder friction - Rolling resistance – Belt friction.

Text book (s) :

1.	M.S. Palanichamy, "Basic of Civil Engineering "Tata Mc Graw Hill Education Pvt. Ltd, 2008.
2.	Kottiswaran.N, "Engineering Mechanics – Statics and Dynamics", Sri Balaji Publications, Coimbatore, 2006.

Reference(s) :

1.	Dr. B.C. Punmia, Ashok K. Jain, Arun K. Jain " Basic Civil Engineering", Laxmi Publication, New Delhi, 2010.
2.	Bansal, R.K., "Engineering Mechanics", Laxmi Publications Private Ltd, New Delhi, 2008.

K.S.Rangasamy College of Technology – Autonomous								
41 EE 001 Basics of Electrical Engineering								
Common to CIVIL, BT, NST,CSE & IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	3	0	0	45	3	50	50	100

Objectives	• To determine the voltage, current, power in resistive elements of simple DC circuits by understanding the concept of series-parallel circuit reduction technique. • To determine the Impedance,Power and Power factor in series RL, RC and RLC circuits by understanding the concept of instantaneous,RMS and average value of Voltage/Current in an AC source. • To describe the application of Faraday's,Lenz'slaws and Fleming's rules, and determine the performance of transformers. • To explain the construction, working principle, types and applications of electromechanical energy conversion devices such as DC machines, Induction motors, synchronous generators and stepper motors. • To impart the basic knowledge on power system and its components, simple house wiring layout, types and need for earthing, and energy conservation.
Course Outcomes	**At the end of the course, the students will be able to** 1. Identify the basic elements of electrical circuits and define important terms with their units. 2. Solve DC circuits using Ohm's & Kirchhoff's laws. 3. Characterize the single and three phase AC supply. 4. Calculate impedance, power and power factor of single phase AC circuits. 5 Express the principle of electromagnetic induction and identify its usefulness in electrical engineering. 6 Explain the principle of operation of transformers and calculate its regulation and efficiency. 7 Describe the construction and working of DC machines and identify their applications. 8 Explain the construction and working of AC machines and identify their applications. 9 Outline the components of various sub-systems in a power system. 10. Sketch the layout of simple house wiring by identifying the wiring materials and express the need for energy conservation.

DC Circuits

Basic elements – resistance, inductance and capacitance – Definitions and Units: Current, Voltage, Power and Energy – Ohm's law – Kirchhoff's laws – Simple Series and Parallel circuits.

AC Circuits

Introduction to AC circuits –Single and Three phase AC supply – Advantages of Three phase AC system – Instantaneous, RMS and average value for sine wave form –Series RL,RC and RLC Circuits – Impedance, Admittance, Power and Power factor – Practical importance of power factor – Power & Energy Measurement.

Electromagnetic Induction

Faraday's law of Electromagnetic Induction, Fleming's rules and Lenz's law.

Transformers

Construction, Principle of operation, types, regulation and efficiency, all day efficiency -– Current and Potential transformers.

Generators and Motors

DC Machines: Construction, Principle of operation, types and applications - Three phase and Single phase Induction motors: Construction, Principle of operation, types and applications – Synchronous Generators: Construction, types, principle of operation, regulation – Stepper Motor: Construction, Principle of operation and applications.

Power Systems

Structure of power system – Generation system – Transmission System – Distribution system – Power system protection.

House Wiring

Wiring material and Accessories – Simple wiring layout – Earthing – Lightning Arrestor – UPS – Energy Conservation.

Text book(s):

1	S. Sukhija, T.K. Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford University Press, 2012.
2	M.Maria Louis, "Elements of Electrical Engineering", PHI, New Delhi, 2014.

Reference(s):

1	V.K.Mehta, Rohit Mehta, "Principles of Electrical Engineering", S.Chand Publications, New Delhi, 2014.
2	Edward Hughes, "Electrical and Electronic Technology", Pearson Education, 9th Edition, New Delhi, 2009.
3	Del Tora "Electrical Engineering Fundamentals" Pearson Education, New Delhi, 2007
4	S.P.Bihari and BhuPendraSehgal, "Basic Electrical Engineering – Made Easy", Cengage Learning
5	Alan S Moris, Principles of Measurements and Instruments, Prentice – Hall of India Pvt. Ltd, New Delhi, 1999.

K.S.Rangasamy College of Technology - Autonomous

40 CS 002 Computer Programming

Common to CSE,IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	3	1	0	60	4	50	50	100

Objectives

- To enable students to learn the basic concepts and developing skills in programming using C language
- To apply the knowledge of pointers, structures and unions to solve basic problems in C language
- To enhance the knowledge in file handling functions for storage and retrieval of data
- To gain the knowledge of software development

Course Outcomes

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

1. Recognize the concepts of data types, tokens, storage class specifiers and expressions
2. Examine the execution of branching and looping statements
3. Affirm the concepts of arrays and strings
4. Recognize the concepts of functions, recursion with its features
5. Identify the purpose of pointers with its associated features
6. Comprehend basic concepts of structures and unions
7. Annotate the concept of console Input and output features
8. Interpret the concept of file Input and output features
9. Relate the concept of user defined data types and preprocessor
10. Examine the various software engineering approaches to built a C program

Introduction

An Overview of C - Data types - Identifiers - Variables - Type Qualifiers - Storage Class Specifiers – Constants Operators - Expressions - Selection Statements - Iteration Statements - Jump Statements.

Arrays, Strings and Functions

Arrays - Single Dimensional Arrays - Two Dimensional Arrays - Multidimensional Arrays - Arrays Initialization – Strings - Arrays of Strings - String and Character Functions – Functions - Scope of a Function – Library Functions and User Defined Functions - Function Prototypes - Function Categorization - Function Arguments –Arguments to main() Function - The return Statement - Recursion - Passing Arrays to Functions.

Pointers, Structures and Unions

Pointers - Pointer Variables - The Pointer Operators - Pointer Expressions - Pointers and Arrays - Generating a Pointer to an Array - Indexing Pointers - Dynamic Memory Allocation - Structures - Arrays of Structures –Passing Structures to Functions - Structure Pointers - Arrays and Structures within Structures – Unions.

Console I/O and File I/O

Console I/O - Reading and Writing Characters - Reading and Writing Strings - Formatted Console I/O – File I/O - Streams and Files - File System Basics - fread( ) and fwrite( ) - Random Access I/O - fprintf( ) and fscanf( ) - The Standard Streams.

BitFields, **Enumerations, Typedef, Preprocessors and Software Development**

BitFields - Enumerations - typedef - The Preprocessor and Comments - Software Engineering using C – Top Down Design - Bulletproof Functions - Using MAKE - Efficiency - Porting Programs – Debugging.

Text book(s):

1	Herbert Schildt, “The Complete Reference C”, Fourth Edition, Tata McGraw Hill Edition, 2010.

Reference(s):

1	Byron Gottfried, “Programming with C”, Third Edition, McGraw Hill Education, 2014.
2	E.Balagurusamy, “Programming in ANSI C”, Tata McGraw Hill Edition, New Delhi, 2010.
3	Brian W. Kernighan and Dennis M. Ritchie, “C Programming Language”, Prentice-Hall.

K.S. Rangasamy College of Technology - Autonomous

40 CH 0P1 Chemistry Laboratory

Common to all Branches

Semester	Hours / Week			Total hrs	Credit	Maximum marks		
	L	T	P	45	C	CA	ES	Total
II	0	0	3		2	50	50	100

Objectives	• Test the knowledge of theoretical concepts. • To develop the experimental skills of the learners. • To facilitate data interpretation • To expose the learners to various industrial and environmental applications.
Course Outcomes	**At the end of the course, the student will be able to:** 1. Estimate the hardness of water sample. 2. Estimate the alkalinity of water sample. 3. Estimate the chloride content in water sample. 4. Determine the dissolved oxygen in water. 5. Determine the molecular weight of polymer. 6. Estimate the mixture of acids by conductometry 7. Estimate the ferrous ion by potentiometry. 8. Estimate the strength of acid by pH metry and apply the knowledge of pH determination for health drinks, beverages, soil, effluent and other biological samples. 9. Estimateferrous ion by spectrophotometry. 10. Determine the corrosion by weight loss method.

List of Experiments

1. Estimation of hardness of water by EDTA method.
2. Estimation of alkalinity of water sample.
3. Estimation of chloride content in water sample (Argentometric method).
4. Determination of dissolved oxygen in boiler feed water (Winkler's method).
5. Determination of molecular weight of a polymer by viscometry method.
6. Estimation of mixture of acids by conductometric titration.
7. Estimation of ferrous ion by potentiometric titration.
8. Estimation of HCl beverages and other biological samples by pH meter.
9. Estimation of iron content by spectrophotometry method.
10. Determination of corrosion by weight loss method.

Lab Manual:

1. Vairam S "Engineering Chemistry", Wiley India, Delhi, 2 nd Edition, 2013

Reference(s):

1. Mendham. J, Denney. R.C, Barnes. J.D and Thomas. N.J.K, "Vogel's text book of quantitative chemical analysis", 6th Edition, Pearson Education, 2004.

K.S.Rangasamy College of Technology - Autonomous

40 CS 0P2 Computer Programming Laboratory

Common to CS & IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	0	0	3	45	2	50	50	100

Objectives

- To enable the students to apply the concepts of C to solve simple problems
- To apply the knowledge of library functions in C programming
- To implement the concepts of functions, structures and enumerator in C
- To implement the file handling operations through C

Course Outcomes

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

1. Write a simple C program to read and display basic information.
2. Develop a C program using selection and iterative statements.
3. Demonstrate a C program to manage collection related data.
4. Interpret a C program to perform string manipulation functions.
5. Perform dynamic memory allocation using C.
6. Design and Implement different ways of passing arguments to functions.
7. Implement a C program to manage collection of different data using Structure or Enum.
8. Apply a C program to manage data using preprocessor directives.
9. Demonstrate a C program to store and retrieve data using file concepts.
10. Develop a Mini Project.

LIST OF EXPERIMENTS

1. Implement basic calculations using MS EXCEL.
2. Implement a simple C program to read and display basic information.
3. Implement a C program using selection and iterative statements.
4. Implement a C program to manage collection related data.
5. Implement a C program to perform string manipulation functions.
6. Implement a C program to perform dynamic memory allocation.
7. Implement different ways of passing arguments to functions.
8. Implement a C program to manage collection of different data using Structure or Enum.
9. Implement a C program using preprocessor directives.
10. Implement a C program to store and retrieve data using file concepts.

K.S.Rangasamy College of Technology – Autonomous

40 ME 0P1 Engineering Graphics Laboratory

Common to CS, EE, EC, IT, NST & EI

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	0	0	3	45	2	50	50	100

Objectives

- To enable the students with various concepts like dimensioning, conventions and standards related to working drawings in order to become professionally efficient
- To impart the graphic skills for communicating concepts, ideas and designs of engineering products

Course outcomes

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

1. Use the drawing instruments, drafting software and construct the conics
2. Draw the projection of points, straight lines and plane surfaces
3. Draw the projection of simple solids
4. Draw the true of section of solids
5. Develop the lateral surfaces of prism, pyramid, cylinder and cone
6. Convert the pictorial views in to orthographic views
7. Sketch the three dimensional view of solids given orthographic views

Introduction to Engineering Drawing

Introduction to Drafting Software, Drawing Sheet Layouts - Title Block - Lines - Dimensioning, Construction of Pentagon, Hexagon, Conic Sections. Construction of Ellipse and Parabola (Eccentricity method only) with tangent and normal. Introduction to cycloid Involutes of square and circle.

Projection of Points, Lines And Planes

Projection of points, straight lines and plane surfaces in first quadrant (parallel to one plane and inclined to other), true length, true inclinations.

Projection of Solids

Projection of solids of Prisms, Pyramids, Cylinder and Cone using change of position method (axis is parallel to one plane).

Section of Solids

Section of solids of Prisms, Pyramids, Cylinder and Cone by cutting plane inclined to one reference plane (base is on HP and axis perpendicular to HP), true shape of section.

Development of Surfaces

Development of lateral surfaces of simple and truncated solids: Prisms, Pyramids and Cones with square hole perpendicular to the axis.

Orthographic Projection

Theory of projection - Terminology, Method of projection – Introduction of First angle and Third angle projection. Conversion of pictorial views into orthographic views.

Isometric Projection

Principles of isometric projection, Isometric scale - isometric projections of simple solids - Prisms, Pyramids and Cones.

Text book(s) :

1	Bhatt N.D., “Engineering Drawing”, Charotar Publishing House Pvt. Ltd., 49th Edition, Anand, Gujarat, 2006.
2	Venugopal K., “Engineering Graphics”, New Age International (P) Limited, 2002.

Reference(s) :

1	Kulkani D.M, Rastogi A.P, Sarkar A.K, “Engineering Graphics with AutoCAD”, PHI Learning Private Limited, New Delhi, 2009.
2	Natarajan K.V., “A textbook of Engineering Graphics”, Dhanalakshmi Publishers, Chennai, 2006
3	Shah M.B. and Rana B.C., “Engineering Drawing”, Pearson Education, 2005.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY – AUTONOMOUS								
40 MA 004 - BOUNDARY VALUE PROBLEMS AND TRANSFORM METHODS								
COMMON TO CIVIL, CS ,IT, MCT, ME, NST								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	1	0	60	4	50	50	100

Objective(s)	• To apply Fourier series and Fourier transform for engineering discipline. • To acquire analytical skills in the areas of one dimensional and two dimensional boundary value problems. • To introduce the concepts of Z- transform and its application to various problems related to engineering and technology.
Course Outcomes	**At the end of the course, the students will be able to** 1. Obtain the Fourier series expansion for the periodic function. 2. Understand the notions of half – range Fourier series and harmonic analysis. 3. Know about the procedure to find the solution of one-dimensional wave equation with zero or non-zero velocity. 4. Understand the procedure to find the solution of one-dimensional heat equation with steady state or unsteady state condition. 5. Solve the solution of two dimensional heat flow equation for finite plates. 6. Solve the solution of two dimensional heat flow equation for infinite plates. 7. Apply Fourier transform technique and Parseval's identity for the continuous function. 8. Discuss the Fourier sine and cosine transforms and properties of Fourier transforms. 9. Understand the concepts of Z- transform for some elementary functions and its properties. 10. Apply the inverse Z-transform techniques to the function and solve the difference equation using Z-transform.

FOURIER SERIES

Dirichlet's conditions – Fourier series – Odd and even functions – Half range Fourier series – Root mean square value of a function – Parseval's identity – Harmonic analysis.

BOUNDARY VALUE PROBLEMS – I

Classification of second order quasi - linear partial differential equations – Solution of one-dimensional wave equation – Solution of one-dimensional heat equation – Problems.

BOUNDARY VALUE PROBLEMS – II

Two dimensional heat flow equation (Insulated edges excluded): Finite plates – Square plates temperature given in horizontal edge – Square plate temperature given in horizontal and vertical edges – Rectangular plates temperature given in horizontal edge – Rectangular plates temperature given in horizontal and vertical edges Infinite plates – Vertically infinite plates – Horizontally infinite plates.

FOURIER TRANSFORM

Fourier transform pair – Fourier transform of simple functions – Fourier sine and cosine transform – Properties – Convolution theorem – Parseval's identity – Problems.

Z –TRANSFORM

Z-transform – Elementary properties – Initial and final value theorem – Inverse Z – transform – Partial fraction method – Residue method – Convolution theorem – Solution of difference equations using Z - transform.

Text book (s):

1.	Grewal B.S, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, Delhi, 2012.
2.	Kreyszig E, "Advanced Engineering Mathematics", 9th Edition, John Wiley & Sons (Asia) Limited, New Delhi, Reprint 2012.

Reference(s) :

1.	Veerarajan T, "Engineering Mathematics-III", Tata McGraw-Hill Publishing Company Limited, New Delhi.
2.	Bali N.P and Manish Goyal, "A Text book of Engineering Mathematics", 9th Edition, Lakshmi Publicatior Pvt Ltd, New Delhi, 2014.
3.	Glyn James, "Advanced Modern Engineering Mathematics", 4th Edition, Pearson Education, 2011.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY – AUTONOMOUS								
40 CS 003 - DATA STRUCTURES								
COMMON TO CS,IT,EE,EC,EI								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective(s)	• To choose the appropriate data structure for a specified application • Design and implement abstract data types such as linked list, stack , queue and trees • Demonstrate various sorting, searching and graph algorithms.
Course Outcomes	**At the end of the course, the students will be able to** 1. Express the concept of List ADT and its implementations 2. Describe the operations of Stack and Queue ADT and its applications 3. Compare the concept of Binary, Binary Search and AVL Trees with its operations 4. Gain the knowledge of Splay ,B-Trees and B+ Trees 5. Apprise the various Hashing techniques 6. Review various implementations and operations of Priority Queue 7. Recognize the concept of Sorting ,Searching and its types 8. Employ various Internal and External sorting techniques 9. Apply Shortest Path and Minimum Spanning Tree algorithms 10.Illustrate the concept of Depth First Search and Biconnectivity

LISTS, STACKS AND QUEUES

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT

TREES

Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Splay Trees – B – Trees –B+Trees.

HASHING AND PRIORITY QUEUES (HEAPS)

Hashing – Hash Function – Separate chaining – Open addressing – Rehashing – Extendible hashing – Priority Queues (Heaps) – Model – Simple Implementations – Binary Heap – Applications of Priority Queues – d - Heaps.

SORTING AND SEARCHING

Preliminaries – Insertion Sort – Shellsort – Heapsort – Mergesort – Quicksort – External Sorting –Searching: Sequential search- Binary Search –Hashed list searches

GRAPHS

Definitions – Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm, Kruskal's Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity.

Text book(s):

1.	M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd edition, Pearson Education Asia.2008.

Reference(s) :

1.	Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, "Data Structures using C", Pearson Education Asia, 2009.
2.	Rajesh K.Sukla," Data structure using C & C++", Wiley India, 2012.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 CS 004 - OBJECT ORIENTED PROGRAMMING								
COMMON TO CS,IT,EC,EE,EI								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective(s)	• To enable the students to learn how C++ supports object Oriented properties • To create and use classes and objects for specific applications • To understand the role of inheritance, polymorphism, dynamic binding and generic structures in building reusable code
Course Outcomes	**At the end of the course, the students will be able to** 1. Recognize the principles of object-oriented problem solving and programming. 2. Review the essential features and elements of the C++ programming language 3. Implement the concept of class and objects 4. Comprehend the concept of constructors and destructors 5. Analyze the reusability through various types of Inheritance 6. Interpret the concept of operator overloading 7. Recognize the concept of dynamic memory allocation 8. Implement the concept of runtime polymorphism by using virtual functions 9. Identify the uses of generic programming and exception handling 10. Interpret the file operation concepts to manipulate the data

INTRODUCTION TO C++ AND FUNCTIONS

Evolution of C++ - The Object Oriented Technology - Disadvantages of Conventional Programming-Concepts of OOP - Advantages of OOP,Basics of C++:Structure of a C++Program- Streams in C++ and Stream Classes - Formatted Console I/O Operations-Bit Fields - Manipulators - User-defined Manipulators, C++ Declarations, Functions: L Values and RValues - Return by Reference - Returning more Values by Reference - Default Arguments -Constarguments - Inline Functions - Function Overloading.

CLASSES AND OBJECTS, CONSTRUCTORS AND DESTRUCTORS

Classes in C++ - Declaring Objects- Access Specifiers and their Scope - Defining Member Functions - Static Members - Array of Objects - Constant object and Constant Member Functions - Object as Function Arguments - Friend Function and FriendClasses, Constructors and Destructors: Characteristics - Parameterized Constructors - Overloading Constructors - Copy Constructors - Dynamic Initialization Constructors – Destructors.

INHERITANCE, OPERATOR OVERLOADING AND TYPE CONVERSION

Inheritance: Reusability - Types of Inheritance - Object as Class Member, Operator Overloading: The Keyword Operator - Unary, Binary and Stream Operators Overloading- Constraint on Increment and Decrement Operators - Rules for Operator Overloading -Overloading usingFriend Function -Type Conversion.

POINTERS, MEMORY MODELS, BINDING AND POLYMORPHISM

Pointers: Pointer to Class - Pointer to Object –void, wild and this Pointers, Memory Models: Dynamic Memory Allocation - Heap Consumption - Object Address - Dynamic Objects, Binding: Binding in C++ - Pointer to Base and Derived class objects -Working with Virtual Functions - Pure Virtual Functions -Abstract Classes - Object Slicing - Virtual Destructor, Working with Strings.

GENERIC PROGRAMMING WITH TEMPLATES, EXCEPTION HANDLING AND APPLICATIONS OF FILES

Class and Function Templates -Overloading of Template Functions, Exception Handling: Principles of Exception Handling -try, catch and throw- Re-throwing Exception - Specifying Exception, Class Templates with Exception, File Stream Classes - Steps of File Operations - File Opening Modes - File Pointers and Manipulators - File Access - Command Line Arguments - Error Handling Functions.

Text book(s):

1.	Ashok N. Kamthane, “Programming in C++”, Pearson, Second Edition, 2013.

Reference(s) :

1.	Herbert Schildt, “ The Complete Reference C++”, Fourth Edition, McGraw-Hill Education, 2013.
2.	BjarneStroustrup, “The C++ programming language”, Addison Wesley, 2013.
3.	Venugopal K.R., Rajkumar Buyya, "Mastering C++", Second Edition, McGraw-Hill Education, 2013.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 EC 003 - DIGITAL PRINCIPLES AND SYSTEM DESIGN								
COMMON to CS, EC, IT, EE, E&I								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	1	0	60	4	50	50	100

Objective(s)	• To introduce number systems and codes, basic postulates of Boolean algebra and show the correlation between Boolean expressions. • To design and analyze combinational circuits and sequential circuits. • To introduce the concept of memories and programmable logic devices.
Course outcomes	**At the end of the course, the students will be able to** 1. Explain the fundamentals of numbering system, Binary arithmetic and codes 2. Apply the Boolean laws and reduce the Boolean functions using K-map. 3. Implement the Boolean functions using logic gates. 4. Design the combinational logic circuits 5. Discuss the basics of flip flops and realize one flip flop from other flip flop 6. Design the clocked sequential circuits 7. Analyze the asynchronous sequential circuits. 8. Design the fundamental mode circuits. 9. Discuss the operation of various memory devices and their applications. 10. Describe the operation of programmable logic devices and implement combinational logic using PLDs.

NUMBER SYSTEMS

Review of Binary, Octal and Hexadecimal Number Systems –Conversion methods – complements – signed and unsigned Binary numbers. - Binary codes: Weighted and non Weighted codes - ASCII – Error detecting code –Boolean postulates and laws – De-Morgan's Theorem - Boolean function - Minimization of Boolean expressions – Sum of Products (SOP) – Product of Sums (POS)- Canonical forms –– Karnaugh map Minimization – Don't care conditions.

LOGIC GATES & COMBINATIONAL CIRCUITS

LOGIC GATES: AND, OR, NOT, NAND, NOR, Exclusive – OR and Exclusive – NOR - Implementations of Logic Functions using gates, NAND – NOR implementations – TTL and CMOS Logic families and their characteristics –Tristate gates.

COMBINATIONAL CIRCUITS: Design procedure – Adders - Subtractors – Serial adder/ Subtractor - Parallel adder/ Subtractor - BCD adder - Magnitude Comparator – Multiplexer / Demultiplexer - encoder / decoder – parity checker – code converters: binary to gray, gray to binary, BCD to excess 3 code. Implementation of combinational logic using MUX.

SEQUENTIAL CIRCUITS

Flip flops SR, JK, T, D and Master slave – Characteristic table and equation – Application table – Edge triggering – Level Triggering – Realization of one flip flop using other flip flops – Asynchronous / Ripple counters – Synchronous counters –Modulo – n counter – Classification of sequential circuits – Moore and Mealy machines – Analysis of clocked sequential circuits: state equation - State table – State diagram – State reduction & assignment - Register : shift registers - Universal shift register– Shift counters.

ASYNCHRONOUS SEQUENTIAL CIRCUITS

Analysis procedure – Transition table - Flow table – Race conditions -Design of fundamental mode circuits – Primitive flow table – Reduction of state and flow table – Race free state assignment - Hazards: Static – Dynamic – Essential – Hazards elimination.

MEMORY DEVICES

Classification of memories : ROM - PROM – EPROM – EEPROM – EAPROM, RAM – Write operation – Read operation – Memory cycle - Timing wave forms – Memory decoding – memory expansion – Static RAM Cell- Bipolar RAM cell – MOSFET RAM cell – Dynamic RAM cell –Programmable Logic Devices : Programmable Logic Array (PLA) - Programmable Array Logic (PAL) – Field Programmable Gate Arrays (FPGA) - Implementation of combinational logic circuits using ROM, PLA, PAL.

Text book(s)

1	M. Morris Mano, Michael D. Ciletti, 'Digital Design', 5th Edition, Pearson Education, New Delhi, 2012.

Reference(s) :

1	Anand Kumar, 'Fundamentals of Digital Circuits', 3rd Edition, Prentice Hall, 2014.
2	Donald P.Leach and Albert Paul Malvino, Goutam Saha, 'Digital Principles and Applications', 7th Edition, Tata McGraw-Hill, New Delhi, 2010.
3	S. Salivahanan and S. Arivazhagan, 'Digital Circuits and Design', 3rd Edition, Vikas Publishing House Pvt. Ltd, New Delhi, 2009.
4	John F.Wakerly, 'Digital Design: principles and practices', 4th Edition, Pearson Education, 2008.
5	Charles H.Roth, 'Fundamentals of Logic Design', 5th Edition, Brooks/cole, 2004.
6	John .M Yarbrough, 'Digital Logic Applications and Design', 1st Edition, Nelson Engineering, 2006.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 EC 004 - ELECTRONIC DEVICES AND CIRCUITS								
COMMON to CS & IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P			CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective(s)	• To describe the operation of semiconductor diodes and transistors • To design and analyze transistor biasing circuits • To analyze feedback amplifiers and oscillators • To analyze the performance of various power amplifiers
Course Outcomes	1. Describe the construction and working of various diodes 2. Discuss the working principle of rectifier and regulator circuits 3. Explain the construction and operation of BJT 4. Explain the construction and operation of FET. 5. Discuss the concepts of biasing and stabilization in BJT 6. Design appropriate biasing circuits for FET 7. Describe the concept of feedback and the feedback amplifier types 8. Design the various oscillator circuits. 9. Describe the working principle of power amplifiers 10. Compare the performance of various power amplifiers.

SEMICONDUCTOR DIODES

PN junction–Biased junctions - PN junction diode:characteristics and parameters – Diode approximations – Zener diode –LED, photodiode, PIN diode, shockley diode, varactor diode, tunnel diode.
Applications: Half wave rectification, full wave rectification, zener diode as a voltage regulator

TRANSISTORS

Bipolar junction transistor operation – BJT voltage and currents – BJT amplification – BJT switching – CB, CE and CC characteristics – Field Effect Transistors – Junction Field Effect transistor operation – JFET characteristics – MOSFET: Enhancement and depletion types – Comparison of BJT with FET.

TRANSISTOR BIASING

BJT biasing: DC load line and bias point – Base bias, collector to base bias, voltage divider bias. – comparision of basic bias circuits – Thermal stability of bias circuits – FET biasing : DC load line and bias point – Gate bias, self bias, voltage divider bias – Bias circuit design

FEEDBACK CIRCUITS

Concept of feedback- Topological classification : Voltage series, Voltage shunt, Current series, Current shunt - Effect of feedback on gain, bandwidth, input and output impedances, Barkhausen criterion for sustained oscillations - RC oscillators : RC phase shift oscillator , Wein bridge oscillator –LC Oscillators: Colpitts , Hartley oscillators.

POWER AMPLIFIERS

Classification of amplifiers – Class A direct coupled and transformer-coupled power amplifiers – Class B complementary-symmetry and push-pull power amplifiers – Calculation of power output, efficiency and power dissipation – Crossover distortion and its elimination.

Text book (s) :

1	David A. Bell, ' Electronic devices and circuits ', Oxford University press, 5th edition, 2008
2	Robert L. Boylestad , Louis Nashelsky, ' Electronic Devices and circuit theory', 11th Edition, Pearson, 2013

Reference(s) :

1	Millman J. and Halkias .C, ' Electronic devices and circuits ', Tata McGraw-Hill, 2013
2	Floyd, 'Electronic Devices', Sixth edition, Pearson Education, 2003.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 PH 008 - APPLIED PHYSICS								
Common to all Branches								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100
Objective(s)	• To enhance students' knowledge of theoretical and modern technological aspects in physics • To enable the students to correlate the theoretical principles with application oriented studies							
Course Outcomes	**At the end of the course the students will be able** to 1. Explain the principle of laser emission and classification of lasers 2. Identify the applications of lasers. 3.Explain the propagation of lights in fibre optic cables, classification of fibre, splicing and their fabrication. 4. Describe the fibre optic communication link, its applications and light propagation losses. 5. Explain the production and detection of ultrasonic waves. 6. Identify the industrial and medical applications of ultrasonic waves. 7. Explain the development of quantum theory and its applications. 8. Describe the concepts of nuclear physics and identify the elementary particles. 9. Classify the sound and analyze its characteristics 10. Give suggestions for buildings with good acoustics							

LASER TECHNOLOGY

Introduction – Principle of spontaneous emission, stimulated absorption and emission – Einstein's co-efficient (derivation)-population inversion-pumping mechanisms – Types of lasers: Nd:YAG, Semiconductor laser (homo junction and hetero junction), CO_2 laser – Industrial applications: Lasers in welding, cutting, drilling and soldering- Medical applications: laser endoscopy,– Holography: Construction and reconstruction of hologram – Applications.

FIBER OPTICS AND SENSORS

Principles – cone of acceptance, numerical aperture (derivation)- Modes of propagation –Fabrication: Crucible-crucible technique - Classification: based on materials, modes and refractive index profile– Splicing – types of splicing- Losses in optical fiber – Light sources for fiber optics – Detectors – Fiber optical communication links(Block diagram) – Advantage of fiber optical cable over copper cables- Fiber optic sensors-principle-liquid level sensors- Temperature, Displacement, measurement.

ULTRASONICS AND APPLICATIONS

Introduction-Properties-Production: Magnetostriction effect, magnetostriction generator- piezoelectric effect, piezoelectric generator – Ultrasonic detection- acoustical grating-Applications: Cavitation, cleaning, SONAR,– Non destructive testing: Pulse echo system, through transmission, resonance system- Medical applications: cardiology, neurology, ultrasonic imaging (A, B and TM- Scan).

QUANTUM AND NUCLEAR PHYSICS

Quantum physics: Introduction – de-Broglie hypothesis –Matter waves– Uncertainty principle, application: single slit experiment – wave function-physical significance-Schrodinger's wave equation: Time dependent and time independent – Particle in a box (one dimensional and three dimensional)–Microscopy: Scanning Electron Microscope.

Nuclear Physics: Introduction, atomic nucleus, nuclear force, nuclear density, atomic mass unit - mass defect - Binding energy-Nuclear fission-Energy released in fission- Stellar energy-elementary particles:Leptons, Hadrons: Mesons and Baryons

ACOUSTICS

Introduction-Classification of sound – Characteristics of musical sound – sound intensity level – Weber-Fechner law – loudness level and intensity: Bel, Decibel–Reverberation – Reverberation time – Sabine's formula (derivation) – sound absorption coefficient measuring method -Absorption co-efficient (derivation)– Factors affecting the acoustics of buildings and their remedies - basic requirements for acoustically good halls - acoustical materials.

Text book:

1	V.Rajendran, Engineering Physics, Tata McGraw Hill Publishers, New Delhi, 2011

Reference(s) :

1.	Jeremy Bernstein, Paul M.Fishbane, Stephen Gasiorowicz, Modern Physics, Pearson Education, 2009.
2.	S.Kalainathan, A.Ruban kumar, Physics for Engineers, , RBA publications, Chennai, 2010.
3.	A.Arumugham, Engineering Physics, Anuradha Agencies, Chennai, 2005.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40CS0P3 - DATA STRUCTURES LABORATORY								
COMMON TO CS,IT,EE,EC								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
III	0	0	3		2	50	50	100

Objectives	• To design and implement simple linear and non linear data structures • To strengthen the ability to identify and apply the suitable data structure for the given real world problem • To gain knowledge of graph applications
Course Outcomes	**At the end of the course, the students will be able to** 1. Demonstrate the implementation of List ADT 2. Demonstrate the implementation of Stack ADT 3. Demonstrate the implementation of Queue ADT 4. Investigate Balanced Parenthesis and Postfix expressions with the help of Stack ADT 5. Implement Search Tree ADT 6. Demonstrate various collision resolution techniques in Hashing 7. Implement Internal sorting 8. Perform various Searching Techniques 9. Implement Shortest Path algorithm 10. Implement Minimum Spanning Tree algorithm

LIST OF EXPERIMENTS

1. Implementation of List Abstract Data Type (ADT)
2. Implementation of Stack ADT
3. Implementation of Queue ADT
4. Implementation of stack applications:
   (a) Program for 'Balanced Parenthesis''
   (b) Program for 'Evaluating Postfix Expressions'
5. Search Tree ADT
6. Develop a program for various collision resolution techniques in Hashing
7. Implementation of Internal Sorting
8. Develop a program for various Searching Techniques.
9. Implementation of Shortest Path algorithm
10. Implementation of Minimum Spanning tree algorithm.

K.S. Rangasamy College of Technology - Autonomous								
41 CS 0P4 Object Oriented Programming Laboratory								
Common to CS,IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
III	0	0	3		2	50	50	100
Objective(s)	• To design various UML diagrams and develop object oriented programs using C++ with associated libraries • To understand and apply various object oriented features such as inheritance, operator overloading and polymorphism to solve various computing problems using C++ language • To apply exception handling and use built in classes from STL							
Course Outcomes	**At the end of the course, the students will be able to** 1. Demonstrate the input and output operations using stream classes 2. Create a function to manage large amount of statements 3. Implement the concept of class and objects 4. Demonstrate the concept of constructors and destructors 5. Implement the concept of reusability using inheritance 6. Perform operator overloading and type conversion 7. Implement the concept of dynamic objects 8. Implement virtual function to handle function overriding 9. Demonstrate the concept of templates 10. Perform exception handling							

The laboratory should be preceded by a tutorial to design UML diagrams.

1. Construct a C++ program to manage the input and output operations using stream classes
2. Construct a C++ program to manage large amount of statements using functions
3. Design a C++ program to implement the concept of class and objects
4. Develop a C++ program to initialize the class members using constructors and destroy the objects by using destructor
5. Design a C++ program for reusability using inheritance
6. Write a C++ program to perform operator overloading and type conversion
7. Develop a C++ program to implement the concept of dynamic objects
8. Develop a C++ program to handle function overriding by using virtual function.
9. Develop a C++ program to allow functions and classes to operate with generic types using templates
10. Construct a class in C++ to handle predefined and user defined exceptions
11. Design a C++ program to perform various operations using STL

K.S. RANGASAMY COLLEGE OF TECHNOLOGY – AUTONOMOUS								
40 EC 0P1 - ANALOG AND DIGITAL CIRCUITS LABORATORY								
COMMON to CS & IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
III	0	0	3		2	50	50	100
Objective(s)	• To demonstrate the characteristics of electronic devices • To illustrate the working principle of rectifiers, amplifier and oscillator • To design and implement digital circuits							
Course Outcomes	**At the end of the course, the students will be able to** 1. Demonstrate the characteristics of PN junction diode and Zener diode 2. Test the characteristics of Bipolar Junction Transistor in Common Emitter configuration 3. Determine the characteristics of JFET 4. Test the rectifiers with and without filters 5. Determine the frequency response of CE amplifier 6. Construct and test RC phase shift oscillator 7. Construct and test logic gates 8. Design and implement combinational logic circuits 9. Design and implement sequential circuits							

1. Characteristics of PN Junction Diode and Zener Diode.
2. Characteristics of BJT (common emitter configuration).
3. Characteristics of JFET
4. Half Wave and full wave Rectifier.
5. Frequency response of CE amplifier using voltage divider bias.
6. RC phase shift oscillator.
7. Study of logic gates.
8. Design of JK, D and T flip flops.
9. Design of Mod-n counter.
10. Design of encoder and decoder.
11. Design of multiplexer and demultiplexer.
12. Design of shift register (SISO & PIPO)

K.S.Rangasamy College of Technology - Autonomous Regulation								R 2014
Department	**Information Technology**	**Programme Code & Name**			**IT : B.Tech. Information Technology**			
Semester III								
Course Code	**Course Name**	**Hours/Week**			**Credit**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CA**	**ES**	**Total**
40 TP 0P1	**Career Competency Development I**	**0**	**0**	**2**	**0**	**100**	**00**	**100**
Objective(s)	To enhance employability skills and to develop career competency							

Unit – 1	**Written Communication – Part 1**	**Hrs**
Usage of noun, pronoun, adjective (Comparative Forms), Verb, Adjectives, Adverb, Tenses, Articles and Preposition - Change of Voice - Change of Speech - Synonyms & Antonyms - One Word Substitution - Using the Same Word as Different Parts of Speech - Odd Man Out **Materials:** Instructor Manual, Word Power Made Easy Book		8
Unit – 2	**Written Communication – Part 2**	6
Analogies - Sentence Formation - Sentence Completion - Sentence Correction - Idioms & Phrases - Jumbled Sentences, Letter Drafting (Formal Letters) - Reading Comprehension(Level 1) - Contextual Usage - **Materials:** Instructor Manual, Word Power Made Easy Book		
Unit – 3	**Written Communication – Part 3**	4
Jumbled Sentences, Letter Drafting (Formal Letters) - Foreign Language Words used in English - - Spelling & Punctuation (Editing) **Materials:** Instructor Manual, News Papers		
Unit – 3	**Oral Communication – Part 1**	6
Self Introduction - Situational Dialogues / Role Play (Telephonic Skills) - Oral Presentations- Prepared -'Just A Minute' Sessions (JAM) **Materials:** Instructor Manual, News Papers		
Unit – 5	**Oral Communication – Part 2**	6
Describing Objects / Situations / People, Information Transfer - Picture Talk - News Paper and Book Review **Materials:** Instructor Manual, News Papers		
	Total	**30**

Evaluation Criteria

S.No.	Particular	Test Portion	Marks
1	Evaluation 1 Written Test	50 Questions – 30Questions from Unit 1 & 2, 20 Questions from Unit 5, (External Evaluation)	50
2	Evaluation 2 Oral Communication 1	Self Introduction, Role Play & Picture Talk from Unit-3 (External Evaluation by English and MBA Dept)	30
3	Evaluation 3 Oral Communication 2	Book Review & Prepared Speech from Unit-4 (External Evaluation by English and MBA Dept)	20
		Total	**100**

Reference Books

1. Aggarwal, R.S. “A Modern Approach to Verbal and Non-verbal Reasoning”, Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.
2. Word Power Made Easy by Norman Lewis W.R. GOYAL Publications

Note :

- Instructor can cover the syllabus by Class room activities and Assignments(5 Assignments/week)
- Instructor Manual has Class work questions, Assignment questions and Rough work pages
- Each Assignment has 20 questions from Unit 1, 2 and Unit 5 and 5 questions from Unit 3 and 4
- Evaluation has to be conducted as like Lab Examination.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 MA 011 - STATISTICS AND QUEUING THEORY								
COMMON TO CSE,IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	1	0	60	4	50	50	100

Objective(s)	• To acquire skills in the concepts of the probability. • To familiarize the student with various methods in hypothesis testing. • To develop the knowledge in queuing system.
Course Outcomes	**At the end of the course, the students will be able to** 1. Gain the knowledge of probability in more events. 2. Solve the probabilities of one and two dimensional random variable. 3. Apply discrete probability distributions in engineering problems. 4. Apply continuous probability distributions in engineering problems. 5. Analyze the average relationship between two characteristics. 6. Test the statistical hypothesis using t Test, F Test and Chi Square Test. 7. Analyze the variance of factors using CRD and RBD. 8. Analyze the multi-factorial design of experiment using Latin square. 9. Acquire the knowledge to find the average customer and time in the infinite queue. 10. Acquire the knowledge to find the average customer and time in the finite queue and general queue.

PROBABILITY AND RANDOM VARIABLES

Axioms of probability – Conditional probability – Baye's theorem – Random variable – Probability mass function – Probability density function – Moments – Moments generating function – Two dimensional random variables – Joint distributions – Marginal and Conditional distributions.

STANDARD DISTRIBUTIONS

Binomial, Poisson, Geometric distributions- Uniform, Exponential, Gamma and Normal distributions - properties and problems.

CORRELATION AND TESTING OF HYPOTHESIS

Covariance – Correlation and Regression – Small Sampling distributions – Testing of hypothesis, Student t, F Test – Chi-square Tests for independence of attributes and Goodness of fit.

DESIGN OF EXPERIMENTS

Analysis of variance – One way classification – Completely Randomized block Design – Two-way classification – Randomized Block Design – Latin square.

QUEUING THEORY

Markovian models – Single and Multiple server queuing models finite and infinite capacity – M/G/1 queue – Pollaczek-Khintchine formula (exculding proof) – Problems.

Text book(s):

1.	Gupta S.P, "Statistical Methods", 34th Edition, Sultan Chand & sons, New Delhi, 2005.
2.	Veerarajan T, "Probability Statistics and Random Process", Tata McGraw-Hill Education Private Limited, New Delhi, 2007.

Reference(s):

1.	Ross S, "A first Course in Probability", 5th Edition, Pearson Education, Delhi, 2002.
2.	Johnson R.A, "Miller & Freund's Probability and Statistics for Engineers", 6th Edition, Pearson Education, Delhi, 2000 – (Chapters - 7, 8, 9, 12).
3.	Trivedi K.S, "Probability and Statistics with Reliability, Queuing and Computer Science Applications", 2nd Edition, John Wiley and Sons, 2002.
4.	Palaniammal S, "Probability and Queuing Theory ", Learning Centre, New Delhi.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 401 - COMPUTER ARCHITECTURE								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	0	45	3	50	50	100

Objective(s)	• To analyze the basic structure and operation of a digital computer. • To impart the knowledge on the state of art of hierarchical memory system. • To apply the parallel processing techniques to improve the performance of the processor.
Course Outcomes	**At the end of the course, the students will be able to** 1. Outline the basic functional units of a computer operation and interconnection 2. Explore the ways in which the location of an operand is specified in an instruction 3. Describe various ways in which I/O operations are performed. 4. Identify an alternative approach to transfer large blocks of data. 5. Examine the processor's internal structure and its tasks of fetching, decoding and executing instructions of a program. 6. Discuss the concept of pipelining used in modern computers to achieve high performance. 7. Describe the most common components and organizations used to implement memory. 8. Examine memory speed and discuss the increase in apparent speed and size of memory by means of cache and virtual memory 9. Realize the logic circuits used to implement arithmetic operations. 10. Describe the techniques for improving performance of the processor

BASIC STRUCTURE OF COMPUTERS
Functional units- Basic Operational Concepts - Bus Structures – Performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes .

I/O ORGANIZATION
Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface Circuits – Standard I/O Interfaces (PCI, SCSI, USB).

BASIC PROCESSING UNIT
Fundamental concepts – Execution of a complete Instruction – Multiple bus organization – Hardwired control – micro programmed control - Pipelining – Basic concepts – data hazards – instruction hazards – Superscalar operation.

MEMORY SYSTEM
Basic concepts –- Semiconductor RAMs, ROMs – Speed, size and cost – Cache memories - Performance consideration – Interleaving, hit rate and miss penalty – Virtual memories

ARITHMETIC
Addition and subtraction of signed numbers – Design of fast adders – multiplication of positive numbers- signed operand multiplication and fast multiplication – Integer division – floating point numbers and operations.

PARALLEL PROCESSING
Parallel processing – Hardware multithreading – Vector processing – Shared memory multiprocessors – Comparative study of INTEL, ARM processors

Text book(s):

1.	Carl Hamacher, Zvonko Vranesic Safwat Zaky and Naraig Manjikian "Computer Organization and Embedded systems" 6th Ed, McGraw Hill International Edition , 2012.

Reference(s) :

1.	William Stallings, "Computer Organization & Architecture – Designing for Performance", 9th Ed., Pearson Education, 2012.
2.	David A.Patterson and John L.Hennessy, "Computer Organization & Design, the hardware / software interface", 2nd Ed, Morgan Kaufmann, 2012.
3.	V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", Second Edition, Pearson Education, 2004.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT 002 - DESIGN AND ANALYSIS OF ALGORITHMS

COMMON TO CS, IT

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	1	0	60	4	50	50	100

Objective(s)	• To design algorithms in both the science and practice of computing. • To analyze classic algorithms with analytical methods for efficiency. • To solve NP-hard and NP-complete problems.
Course Outcomes	**At the end of the course, the students will be able to** 1. Define algorithm and identify the problem types. 2. Compare orders of growth to represent asymptotic notations and solve recurrence relations. 3. Apply and inspect recursive and non-recursive algorithms using sample algorithms. 4. Apply 'Brute Force' technique to analyze problems. 5. Apply 'Divide and conquer' and 'Decrease and conquer' design techniques to solve problems. 6. Apply hashing technique for searching problems. 7. Apply 'Transform and conquer', 'Dynamic programming' and 'Greedy' techniques to find shortest path in tree/graph based problems. 8. Construct analogous algorithms for Optimal Binary Search Tree, Huffman trees, Prim's, Kruskal's, and Dijikstra's techniques. 9. Apply 'Backtracking' technique to solve NP-hard problems. 10. Apply 'Branch and bound' technique to solve NP-hard problems.

BASIC CONCEPTS OF ALGORITHMS

Introduction - Fundamentals of Algorithmic Problem Solving - Important Problem types -Fundamentals of the analysis of algorithm efficiency - Analysis Framework - Asymptotic Notations and Basic Efficiency Classes - Recurrence relations: Methods for solving recurrence relations

MATHEMATICAL ANALYSIS OF ALGORITHMS

Mathematical Analysis of Non-recursive Algorithms and Examples - Mathematical Analysis of Recursive Algorithms - Example: Fibonacci numbers - Empirical Analysis of Algorithms - Algorithm Visualization

BRUTE FORCE AND DIVIDE AND CONQUER TECHNIQUES

Selection Sort and Bubble Sort - Sequential Search and Brute-force string matching - Merge sort - Multiplication of Two n-Bit Numbers - Quick Sort - Binary Search - Binary tree Traversal and Related Properties

ALGORITHM DESIGN PARADIGM

Decrease and Conquer Technique: Insertion Sort - Depth first Search and Breadth First Search - Space and Time Tradeoffs: Hashing - Transform and Conquer Technique: Presorting - Balanced Search trees: AVL Trees - Heaps and Heap sort

DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE

Warshall's and Floyd's Algorithm - Optimal Binary Search trees - Prim's Algorithm - Kruskal's Algorithm - Dijikstra's Algorithm - Huffman trees

NP HARD AND NP-COMPLETE PROBLEMS

P and NP problems- NP complete problems – Backtracking: N-Queen's Problem – Hamiltonian Circuit problem - Subset-Sum Problem- Branch and Bound Techniques: Knapsack problem – Traveling salesman problem - Assignment problem

Text book(s):

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Second Edition, Tenth Impression, Pearson Education Asia, 2013.

Reference(s):

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2001.
2. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", Pearson Education Asia, 2003.
3. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education Asia, 2003.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 EC 005 - MICROPROCESSORS AND MICROCONTROLLERS

COMMON to CS & IT

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	0	45	3	50	50	100

Objective(s)	• To introduce the architecture and programming of 8086 microprocessors, interfacing of peripheral devices with 8086 microprocessors. • To introduce the architecture, programming and interfacing of 8051 micro controller. • To explore the applications using microcontroller 8051
Course Outcomes	**At the end of the course, the students will be able to** 1. Describe the concept of 16 bit microprocessor and its architecture 2. Develop the assembly language program using instruction set of 8086 microprocessor 3. Describe the functional units of peripheral IC's 4. Interface the peripheral IC's with 8086 Microprocessor and can configure its functionality 5. Describe the fundamental features and operation of 8051 microcontroller 6. Develop the assembly language program using instruction set of 8051 microcontroller 7. Program the ports, timers, counters and UART of 8051 microcontroller for various applications 8. Interface ADC/DAC with 8051microcontroller 9. Interface the input and output devices with 8051Microcontroller 10. Develop the 8051 microcontroller based system for various applications

8086 MICROPROCESSOR

8086 Internal Architecture - Addressing modes - Instruction set - Assembly language Programming- signals and timing – MIN/MAX mode of operation – Interrupts - Interfacing memory and I/O devices.

PERIPHERALS INTERFACING

Programmable Peripheral Interface (PPI 8255) –Programmable Interval Timer (PIT 8253) – 8259 Programmable Interrupt Controller – keyboard & display controller (8279) - Interfacing serial I /O (8251)- ADC/DAC interfacing.

8051 MICROCONTROLLER

8051 Architecture- Memory origination-Addressing modes -Instruction set - Microcontroller hardware - I/O pins and ports - Assembly language programming- I/O port programming.

8051 PERIPHERAL AND ITS PROGRAMMING

Interrupts -Counters and Timers- Timer and counter programming - Serial Communication - Interrupt programming, ADC, DAC and sensor interfacing.

8051 APPLICATIONS

LCD and Keyboard Interfacing – RTC Interfacing and programming- Stepper motor and DC motor interfacing. Case study: Traffic light control and washing machine control.

Text book(s):

1	Douglas V.Hall, Microprocessor and Interfacing, Programming and Hardware. Revised second Edition 2006, Eleventh Reprint 2010. Tata McGraw Hill
2	Krishna Kant, Microprocessors and microcontrollers Architecture , Programming and System design 8085,8086,8051,8096,PHI-Third Printing-2010

Reference(s) :

1	Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D.MCKinlay The 8051Microcontroller and Embedded Systems, Second Edition 2008, Fifth Impression 2010,Pearson Education 2008.
2	Ramesh S. Gaonkar, Microprocessor Architecture Programming and Applications with 8085. Fifth edition, Penram International Publishing 2010.
3	A.K. Ray and K.M.Burchandi, Intel Microprocessors Architecture Programming and Interfacing, McGraw Hill International Edition. Twelfth reprint 2009
4	Nilesh B Bahadure, " Microprocessors The 8086 to Pentium Family, PHI, 2010

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 402 - SOFTWARE ENGINEERING								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	0	45	3	50	50	100
Objective(s)	To analyze the software life cycle models, requirement dictation process, analysis modeling , specification for Conventional software and Web Apps. To Implement and test the architectural and design methods. To explore and apply the knowledge about project management and emerging trends in Software Engineering.							
Course Outcomes	**At the end of the course, the students will be able to** 1. Realize the basic concepts of Software Engineering Process . 2. Analyze the Traditional SDLC models, agile process models and risk management. 3. Elicit the requirements engineering in software development process. 4. Develop analysis models in conventional Software and Web APPs. 5. Apprehend the stages involved in architectural design. 6. Outline the procedures involved in software configuration management. 7. Identify the approaches and issues in software testing. 8. Realize the concepts in different testing techniques including Web APPs. 9. Assess software quality, quality control and quality assurance concepts. 10. Estimate and schedule projects with software reengineering and reverse engineering techniques.							

SOFTWARE PROCESS

A Generic Process Models-Perspective Process Models-Waterfall – Incremental – Evolutionary Process Model – Component Based Development. Agile Process – Agile Models: Adaptive Software Development – Risk Management: Risk Identification – Risk Projection – Risk Refinement.

REQUIREMENT ENGINEERING

Requirement Analysis- Scenario Based Modeling –UML models- Data Modeling Concepts – Class Based Modeling -Flow Oriented Modeling– Behavioral Model-Requirements modeling for WebApps.

SOFTWARE DESIGN

Design Concepts – Design Models –Architectural Design- Architectural Mapping using Data Flow-Pattern Based Design: Design Patterns-Architectural Patterns –WebApp Design Patterns-Object Oriented Hypermedia Design Method-User Interface Design- Software Configuration Management-SCM Process-Configuration Management for WebApps.

SOFTWARE TESTING

Software Testing – Strategic Issues – Test Strategies For Conventional And Object Oriented Software – Test Strategies for WebApps-Validation Testing – System Testing – White Box Testing- Basis Path Testing – Control Structure Testing – Black Box Testing – Testing GUI – Testing Client/Server – Test Documentation.

SOFTWARE PROJECT MANAGEMENT

Quality Concepts – Software Quality –Elements of SQA- Software Project Estimation – Decomposition Techniques: Software Sizing – Problem Based Estimation – An Example of LOC Based Estimation – An Example of FP Based Estimation – Empirical Estimation Models – Project Scheduling –Software Reengineering- Reverse Engineering-Tools related trends in Software Engineering.

Text book(s):

1.	Roger S. Pressman., “Software Engineering: A Practitioner’s Approach”, (Seven Edition), McGraw Hill, 2014.

Reference(s) :

1.	Fairely, “Software Engineering Concepts”, McGraw Hill, reprint, 2014.
2.	James F Peters and Witold Pedryez, “Software Engineering – An Engineering Approach”, John Wiley and Sons, New Delhi, 2013.
3.	Pankaj Jalote, ”An Integrated Approach to Software Engineering”, Springer Verlag, Sixth Edition,2000.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 403 - JAVA PROGRAMMING								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	0	45	3	50	50	100

Objective(s)	• To develop programs using the Java Collection API and the Java standard class libraries. • To create network client and server applications. • To analyze and develop Applications and applets using JDBC technology for real world problems.
Course Outcomes	**At the end of the course, the students will be able to** 1. Implement classes and control access to members of a class. 2. Demonstrate reusability through inheritance concepts and perform String operations. 3. Extrapolate code reduction and access different operations through single packages, interfaces and error-handling techniques using exception handling. 4. Apply the concept of multithreading applications that can take advantage of multiple processors and perform remote method invocation. 5. Explore the importance of lang package and collections framework. 6. Explain I/O functionality and network programming for client- server communication, and also enrich the web browser. 7. Designing an event-driven Application using Applet and Event Handling concepts. 8. Developing Graphical User Interface (GUI) based Applications. 9. Effectively use layout managers with AWT and build complex screens with the help of one or multiple layout managers , controls and Menus 10. Outline the database concepts and apply JDBC technology to manipulate data from databases.

JAVA INTRODUCTION

An overview of Java, Classes, Methods and classes, Inheritance, String Handling.

JAVA CONCEPTS

Packages and Interfaces, Exception handling, Multithreaded programming- The Java Thread Model, The Main Thread, Creating a Thread, Creating multiple Threads, Remote Method Invocation (RMI)

PACKAGES

Simple Type Wrappers, Using clone( ) and the Cloneable Interface, Thread, Thread group and Runnable. The Collection Interfaces, The Collection Classes, Using an Iterator, Working with Maps, The Legacy Classes and Interfaces, StringTokenizer, The Byte Streams, The Character Streams, Serialization, Externalizable, Networking Basics, TCP/IP Client Sockets, Datagrams.

APPLET AND ABSTRACT WINDOWING TOOLKIT

Applet Class, Skeleton, The HTML APPLET Tag, Event Handling- The Delegation Event Model, Action Event, Mouse Event, Key Event, The Item event- Class and Interfaces, Adapter class, Window Fundamentals, Working with Frame Windows, Graphics, Color and Font.

AWT PACKAGE AND DATABASE CONNECTIVITY

Using AWT controls, Layout Managers and Menus, Java Database Programming-Introduction, Relational Database Systems QL, JDBC, Prepared Statement, Callable Statement, Retrieving Metadata.

Text book(s):

1.	Herbert Schildt, “The complete Reference – Java 2”, fifth edition, Tata McGraw Hill Publishing Company, 2012.
2.	Y.Daniel Liang “Introduction to Java Programming”, Comprehensive Version, Seventh Edition, Pearson Education,2008 [JDBC only]

Reference(s) :

1.	Advanced programming in JAVA prentice – Hall of India Private Limited NIIT, 2003.
2.	Pratik patel and Karlmoss “Java Data base programming with JDBC”, Second Edition, Dream tech press, 2000.
3.	Java 7 Programming Black Book, Kogent Learning Solutions Inc, DreamTech Press, 2013.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 EC 0P2 - MICROPROCESSORS AND MICROCONTROLLERS LABORATORY								
COMMON to CS & IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
IV	0	0	3		2	50	50	100
Objectives	• To introduce the programming concepts of 8086 microprocessors • To interface peripheral devices with 8086 microprocessors • To introduce the programming concepts of 8051 micro controllers • To interface peripheral devices with 8051 microcontrollers							
Course Outcomes	**At the end of the course, the students will be able to** 1. Perform the basic arithmetic, sorting and searching operations using 8086 2. Demonstrate the interfacing of keyboard and display controller using 8086 3. Demonstrate the interfacing of interrupt controller using 8086 4. Demonstrate the interfacing of Timer using 8086 5. Demonstrate the interfacing of ADC/DAC using 8086 6. Perform the basic arithmetic and logical instructions in 8051 using KEIL IDE 7. Program and verify Timer, Interrupts and UART operations through KEIL IDE in 8051 8. Demonstrate the interfacing of parallel and serial communication in 8051 9. Demonstrate the interfacing of Traffic light controller in 8051 10. Demonstrate the interfacing of Stepper Motor & DC Motor Speed control in 8051							

1. Programs for 16 bit arithmetic, sorting and searching operations.
2. Interfacing and programming of keyboard & display controller
3. Interfacing and programming of interrupt controller
4. Interfacing and programming of Timer
5. Interfacing ADC and DAC.
6. Microcontroller 8051 - Programming using Arithmetic and Logical instructions through KEIL IDE.
7. Microcontroller 8051 - Programming and verifying Timer, Interrupts and UART operations through KEIL IDE.
8. Parallel Communication and Serial Communication
9. Interfacing and Programming of Traffic light controller.
10. Interfacing, Programming of Stepper Motor & DC Motor Speed control.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 4P1 - HARDWARE AND TROUBLESHOOTING LABORATORY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
IV	0	0	3		2	50	50	100
Objective(s)	• To understand motherboard and its components, • To configure BIOS setup, install various operating systems. • To manage trouble shooting.							
Course Outcomes	**At the end of the course, the students will be able to** 1. Understand Motherboard and its interfacing components 2. Configure BIOS setup program and practicing trouble shooting. 3. Install and configure computer drivers and system components. 4.Demostrate Partitioning Hard Disk using FDISK and Formatting Hard Disk 5. Install, upgrade and configure Windows operating systems, Dot-matrix, Laser printer and scanner software. 6. Implement remote desktop connections and file sharing. 7.Identify, Install and manage network connections Configuring IP address and Domain name system 8. Install, upgrade and configure Linux operating systems and vmware. 9. Install Antivirus and configure the antivirus, Trouble shooting and Managing Systems 10. Program Device driver in Linux.							

LIST OF EXPERIMENTS

1. Understanding of Motherboard and its interfacing components
2. Configuring BIOS setup program and practicing trouble shooting of typical problems using BIOS utility.
3. Install and configure computer drivers and system components.
4.Partition Hard Disk using FDISK and Format Hard Disk
5. Install, upgrade and configure Windows operating systems.
6. Install and Configure Dot-matrix, Laser printer and scanner software.
7. Remote desktop connections and file sharing.
8.Identify, Install and manage network connections Configuring IP address and Domain name system
9. Install, upgrade and configure Linux operating systems.
10. Install and configure vmware.
11. Installation of Antivirus and configure the antivirus.
12. Trouble shooting and Managing Systems
13. Device driver program in Linux.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
41 IT 4P2 - JAVA PROGRAMMING LABORATORY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
IV	0	0	3		2	50	50	100

Objective(s)	• To design various UML diagrams and develop programs using basic concepts of Java • To create network client and server application • To analyze and develop Applications and Applets using JDBC technology for real world problems.
Course Outcomes	**At the end of the course, the students will be able to** 1. Implement programs using the concept of class and objects. 2. Illustrate the use of overloading and overriding. 3. Implement the concept of interfaces, packages and exception handling mechanism. 4. Implement inter thread communication and deadlock avoidance. 5. Perform Remote Method Invocation (RMI) 6. Implement the file operations. 7. Implement program using Applets and AWT. 8. Implement program using collections. 9. Implement program using Net package. 10. Implement program using JDBC.

LIST OF EXPERIMENTS

The laboratory should be preceded by a tutorial to design UML diagrams.

1. Program using control statements.
2. Program to implement the concept of class and objects.
3. Program to illustrate the use of overloading and overriding.
4. Program to implement the concept of interfaces and packages.
5. Program using exception handling mechanism.
6. Program to achieve inter thread communication and deadlock avoidance.
7. Program to perform Remote Method Invocation (RMI)
8. Program to implement the file operations.
9. Program using Applets.
10. Program using AWT.
11. Program using collections.
12. Program using Net package.
13. Program using JDBC.

K.S.Rangasamy College of Technology - Autonomous Regulation								R 2014
Department	**Information Technology**	**Programme Code & Name**			**IT : B.Tech. Information Technology**			
Semester IV								
Course Code	**Course Name**	**Hours/Week**			**Credit**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CA**	**ES**	**Total**
40 TP 0P2	**Career Competency Development II**	**0**	**0**	**2**	**0**	**100**	**00**	**100**
Objective(s)	To enhance employability skills and to develop career competency							

Unit – 1	**Written Communication – Part 3**	**Hrs**
Reading Comprehension Level 2 (Paraphrasing Poems) - Letter Drafting - Email Writing - Paragraph Writing - News paper and Book Review Writing - Skimming and Scanning - Interpretation of Pictorial Representations. **Practices:** Sentence Completion - Sentence Correction - Jumbled Sentences - Synonyms & Antonyms - Using the Same Word as Different Parts of Speech - Editing **Materials:** Instructor Manual, Word power Made Easy Book, News Papers		6
Unit – 2	**Oral Communication – Part 3**	
Self Introduction - Miming (Body Language) - Introduction to the Sounds of English - Vowels, Diphthongs & Consonants, Introduction to Stress and Intonation - Extempore - News Paper and Book Review - Technical Paper Presentation. **Material:** Instructor Manual, News Papers		4
Unit – 3	**Verbal Reasoning – Part 1**	
Analogies - Alphabet Test - Theme Detection - Family Tree - Blood Relations (Identifying relationships among group of people) - Coding & Decoding - Situation Reaction Test - Statement & Conclusions **Material:** Instructor Manual, Verbal Reasoning by R.S.Aggarwal		8
Unit – 4	**Quantitative Aptitude – Part 1**	
Problem on Ages - Percentages - Profit and Loss - Simple & Compound Interest - Averages - Ratio, Proportion **Material:** Instructor Manual, Aptitude Book		6
Unit – 5	**Quantitative Aptitude – Part 2**	
Speed, Time & Work and Distance - Pipes and Cisterns - Mixtures and Allegations - Races - Problem on Trains - Boats and Streams **Practices** : Puzzles, Sudoku, Series Completion, Problem on Numbers **Material:** Instructor Manual, Aptitude Book		6
	Total	**30**

Evaluation Criteria

S.No	Particular	Test Portion	Marks
1	Evaluation 1 Written Test	15 Questions Each from Unit 1, 3, 4 & 5 (External Evaluation)	60
2	Evaluation 2 Oral Communication	Extempore & Miming – Unit 2 (External Evaluation by English, MBA Dept.)	20
3	Evaluation 3 Technical Paper Presentation	Internal Evaluation by the Dept.	20
		Total	**100**

Reference Books

1. Aggarwal, R.S. “A Modern Approach to Verbal and Non-verbal Reasoning”, Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.
2. Abhijit Guha, “Quantitative Aptitude”, TMH, 3rd edition
3. Objective Instant Arithmetic by M.B. Lal & GoswamiUpkar Publications.
4. Word Power Made Easy by Norman Lewis W.R. GOYAL Publications

Note :

- Instructor can cover the syllabus by Class room activities and Assignments (5 Assignments/week)
- Instructor Manual has Class work questions, Assignment questions and Rough work pages
- Each Assignment has 20 questions from Unit 1, 3, 4 and Unit 5 and 5 questions from Unit 2.
- Evaluation has to be conducted as like Lab Examination.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 501 - OPERATING SYSTEMS								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To understand the services provided by and the design of an operating system. • To know the components of an operating systems have a thorough knowledge of process management. • Demonstrate the various storage management schemes, I/O and file systems.
Course Outcomes	**At the end of the course, the students will be able to** 1. Recognize the basics of operating systems and its components 2. Acquire the knowledge of communication between processes and IPC systems. 3. Examine the scheduling algorithms and critical section problem. 4. Describe classical synchronization problem and semaphores 5. Acquire the knowledge of Deadlock and its working principle 6. Classify the Storage Management, paging and segmentation. 7. Outline the memory management scheme and page replacement algorithms. 8. Understand the File concept and Directory structure. 9. Analyze the concept of allocation methods, directory structure and free space management 10. Examine disk structure and disk scheduling algorithms

BASIC CONCEPTS

Introduction - Operating System Structure – Operating System Operation–Protection and Security–Distributed Systems– Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication.

PROCESS MANAGEMENT

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization.

DEADLOCKS AND MEMORY MANAGEMENT

Deadlocks – System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks – Main Memory–Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Structure of page table.

VIRTUAL MEMORY AND FILE SYSTEM

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing – File System Interface – File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection.

I/O SYSTEMS

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management

Text book(s):

1.	Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 8th Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2009.

Reference(s) :

1.	Harvey M. Deitel, “Operating Systems”, 3rd Edition, Pearson Education Pvt. Ltd, 2003.
2.	Andrew S. Tanenbaum, “Modern Operating Systems”, 3rd Edition, Prentice Hall of India Pvt. Ltd, 2007
3.	William Stallings, “Operating System”, Prentice Hall of India, 4th Edition, 2003
4.	Pramod Chandra P. Bhatt, “An Introduction to Operating Systems, Concepts and Practice”, 3rd Edition, PHI, 2007.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT 502 - DATABASE MANAGEMENT SYSTEMS

IT

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	1	0	60	4	50	50	100

Objective(s)

- To familiarize the students with various data models and query language.
- To gain knowledge on data storage and querying concepts.
- To expose the fundamentals of transaction processing, recovery concepts and aware of the various current trends in database system.

Course Outcomes

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

1. Express the knowledge of data base systems and analyze the various data models
2. Apply Relational Query Languages to retrieve the data from database
3. Employ the concept of Data Definition Language and Data Manipulation Language
4. Apply the various Normal Forms in database design
5. Express the knowledge of secondary storage device to store the data
6. Appraise the concepts of indexing, hashing and to retrieve the data efficiently from the database
7. Apply the various concurrency control techniques in database transactions
8. Describe the various techniques that ensures database recovery
9. Classify the recent databases such as object-based and distributed
10. Express the knowledge of XML Databases, Multimedia Databases

INTRODUCTION AND CONCEPTUAL MODELING

Introduction to Database Systems - DBMS Applications - Purpose of DBMS - View of Data - Database System Architecture - Data Storage and Querying - DB Users and Administrators - Data Models – ER Model – Relational Model – Relational Algebra and Calculus.

RELATIONAL MODEL

Introduction to SQL – Intermediate SQL – Normalization for Relational Databases (up to 5NF).

DATA STORAGE AND QUERYING

Overview of Physical Storage Media - RAID - File Organization - Organization of Records in Files – Index Structure for Files - Different types of Indexes - B^+-Tree – Hashing Techniques – Query Processing – Query Optimization.

TRANSACTION MANAGEMENT

Transaction – Transaction Concepts - Transaction Model - Desirable Properties of Transaction - Schedule and Recoverability - Serializability – Concurrency Control - Lock-Based Protocols - Two-Phase Locking Protocol - Timestamp-Based Protocols – Recovery System - Failure Classification - Storage - Recovery and Atomicity.

CURRENT TRENDS

Object-Based Databases – Distributed Databases - Homogenous and Heterogeneous Databases - Distributed Data Storage - Distributed Transactions - Commit Protocols – XML Databases – Multimedia Databases.

Text book(s):

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, “Database System Concepts”, 6th Edition, McGraw-Hill, 2011.

Reference(s):

1. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, 5th Edition, Pearson Education, 2009.
2. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing, 3rd Edition, 2014.
3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom, “Database System Implementation”, Pearson Education, 2003.
4. Peter Rob and Corlos Coronel, “Database System, Design, Implementation and Management”, Thompson Learning Course Technology, 5th Edition, 2003.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 503 - COMPUTER NETWORKS								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To understand the concepts of Data Communication and analyze the functions of network models. • To analyze and apply the IEEE standards, design and performance issues employed in networking. • To analyze and apply routing algorithms and to familiarize with the security issues and application layer protocols.
Course Outcomes	**At the end of the course, the students will be able to** 1. Realize the basic components of a network model and its types. 2. Classify the types of transmission medium and encoding techniques. 3. Compare the different error detection and correction techniques. 4. Analyze the flow control, data control and LAN standards. 5. Acquire the knowledge of network layer services and its addressing. 6. Compare the different routing algorithms. 7. Analyze the different communication protocols and its services. 8. Explore the congestion control, QoS and integrated services. 9. Identify the purpose of DNS, HTTP, FTP protocols and WWW. 10. Explore the concepts of cryptography and network security issues.

DATA COMMUNICATIONS

Introduction - Data Communications - Networks -Network Types –TCP/IP Protocol Suite-OSI Model – Transmission Media – Twisted pair Cable -Coaxial Cable – Fiber Optics Cable – Digital-to-Digital conversion-Line Coding Schemes.

DATA LINK LAYER

Error Detection and Correction – Introduction –Block coding –Cyclic Codes – CRC-Checksum –Forward Error Correction - Data Link Control –DLC services –Data link layer protocols –HDLC – Wired LANs: Ethernet Protocol – Standard Ethernet -IEEE 802.3 – IEEE 802.11- FDDI – Bridges and Gateways.

NETWORK LAYER

Network layer services –Packet Switching–Network layer performance- IPV4 Addresses –Address Space-Classful Addressing-Classless Addressing-Next Generation IP- IPv6 Addressing- IPv6 Protocol –Transition from IPv4 to IPv6 – Unicast Routing -Routing Algorithms – Distance Vector Routing – Link State Routing.

TRANSPORT LAYER

Introduction-Transport Layer Protocols- User Datagram Protocol – Transmission Control Protocol– TCP Services-Features- Segment- TCP Connection-TCP congestion control - Quality of services (QOS) –Data Flow Characteristics - Flow control to improve QOS - Integrated Services.

APPLICATION LAYER

World Wide Web and HTTP – FTP – SMTP – Electronic Mail -Domain Name System (DNS) – Cryptography and Network Security-Introduction–Confidentiality-Symmetric-Key Ciphers - Asymmetric-Key Ciphers-Digital Signature.

Text book(s):

1.	Behrouz A. Forouzan, “Data communication and Networking”, 5th Edition, McGraw-Hill, 2013.

Reference(s) :

1.	James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach”, 5th Edition, Pearson Education, 2009.
2.	Larry L.Peterson and Bruce S. Davie, “Computer Networks, A Systems Approach”, 4th Edition, The Morgan Kaufman Series in Networking, 2007.
3.	Andrew S. Tanenbaum, “Computer Networks”, 4th Edition, PHI, 2003.
4.	William Stallings, “Data and Computer Communication”, 8th Edition, Pearson Education, 2007.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 504 - COMMUNICATION SYSTEMS								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To describe the principles of analog and digital communication • To gain knowledge on different antennas and microwave communication • To learn the concepts of Satellite Communication
Course Outcomes	**At the end of the course, the students will be able to** 1. Describe the basic concepts of Amplitude modulation 2. Compare the features of frequency and phase modulation techniques 3. Compare digital transmission with analog transmission 4. Analyze the pulse modulation techniques 5. Comprehend the principles of digital modulation techniques 6. Describe the choice of different digital modulation techniques 7. Comprehend the types and characteristics of different antennas 8. Realize the propagation of radio waves and the application of microwaves in communication 9. Gather knowledge about the satellite orbits, frequency allocation and launching 10. Identify the role of Satellite subsystems and Ground stations

ANALOG COMMUNICATION

Elements of Electronic Communications System – Primary Communication resources – Signal Transmission concepts- Analog and Digital Transmission- Modulation –Types of Analog modulation- Principles of Amplitude Modulation- AM for a complex modulating signal- AM power and current distribution-Principles of Angle Modulation- Theory of FM- Spectrum analysis of FM- Theory of PM- Relationship between FM and PM- Comparison of AM, FM and PM

PULSE MODULATION TECHNIQUES

Digital versus Analog transmissions- Sampling Theorem- Classification of Pulse modulation techniques- Pulse amplitude modulation- Pulse width modulation- Pulse position modulation- Pulse code modulation- Quantization of signals- Differential PCM- Adaptive Differential PCM- Delta Modulation- Adaptive delta modulation- Comparison of PCM techniques

DIGITAL COMMUNICATION

Types of digital modulation- Amplitude shift keying- Frequency shift keying- Phase shift keying- Quadrature phase shift keying- Quadrature Amplitude modulation- Minimum Shift keying- Gaussian minimum shift keying- Choice of Digital modulation techniques

ANTENNAS AND WAVE PROPAGATION

Antenna fundamentals – Common Antenna Types – Radio Wave Propagation – Microwave Concepts – Microwave Antennas – Microwave Applications

SATELLITE COMMUNICATION

Satellite Orbits – Kepler's laws- Satellite Communication Systems – Satellite Subsystems – Ground Stations – Satellite Applications – Global Positioning System

Text book(s):

1.	T L Singal, "Analog and Digital Communications", 1st edition, Mc Graw Hill Education (India), 2012.
2.	Louis E. Frenzel, "Principles of Electronic Communication Systems", 3rd Edition, Tata Mc Graw Hill, NewDelhi, 2008.

Reference(s) :

1.	Wayne Tomasi, "Electronic Communication Systems Fundamentals through advanced", 5th edition, Pearson Education, 2009.
2.	Herbert Taub, Donald L Schilling ,Goutam Saha ,"Principles of Communication Systems", 4th edition, Mc Graw Hill Education,2014.
3.	George Kennedy, Bernard Davis, S.R.M.Prasanna, "Electronic Communication Systems", 5th edition, Mc Graw Hill Education, 2015.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 505 - SYSTEM SOFTWARE								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	1	0	60	4	50	50	100

Objective(s)	• To understand the relationship between system software and machine architecture and to design and implement assemblers, linkers, loaders and macro processors. • To learn the phases of compilers, design and implement a lexical analyzer and parser • To design Intermediate Code Generation and Code Optimization..
Course Outcomes	**At the end of the course, the students will be able to** 1. Analyze the relationship between System Software and Machine Architecture and demonstrate SIC architecture. 2. Analyze the One-Pass and Multi-pass Assembler designs. 3. Apply and design the fundamental functions of a Loader and understand the concept of Relocation and Linking. 4. Apply the concepts of Macros for code reduction and implement data structures involved in macro processor. 5. Illustrate the phases of compiler and its various forms of source program. 6. Design of scanner by understanding the lexical analysis phase. 7. Design concepts of parser 8. Design of different three address code 9. Analyze the issues in the design of code generator. 10. Demonstrate the Peephole optimization and principle sources of optimization

ASSEMBLERS

System software and machine architecture – SIC Machine architecture – SIC/XE Machine architecture – Instruction formats and addressing modes –SIC Programming Examples – Basic assembler functions – A simple SIC assembler – Assembler Algorithm and Data Structures – One-Pass Assemblers and Multi-Pass Assemblers.

LOADERS,LINKERS AND MACROS

Basic loader functions – Design of an Absolute Loader – A Simple Bootstrap Loader – Machine dependent loader features – Relocation – Program Linking- Linkage Editors – Dynamic Linking – Basic macro processor functions – Macro Definition and Expansion – Macro Processor Algorithm and data structures

COMPILERS

Compilers – Analysis of the source program – Phases of a Compiler – Lexical Analysis – Regular Expression – NFA – DFA – Regular Expression to NFA – Regular Expression to DFA – NFA to DFA

PARSER and INTERMEDIATE CODE GENERATION

Syntax Analysis – Role of Parser – CFG – Bottom up Parsing – Shift Reduce Parsing – Non Recursive Predictive Parsing – SLR Parser. Three Address Code – Implementation of Three Address Code

CODE OPTIMIZATION and CODE GENERATION

Basic blocks and Flow Graphs – Peephole optimization – Principal sources of optimization – Issues in the design of code generator – The target machine – Runtime Storage management

Text book(s):

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

Reference(s) :

1.	D. M. Dhamdhere, “Systems Programming and Operating Systems”, 2nd Revised Edition, Tata McGraw-Hill, 1999.
2.	Santanu Chattopadhyay, “System Software”, International Edition, Prentice Hall of India, 2007.
3.	David Galles, “Modern Compiler Design”, 2nd Edition, Pearson Education Asia, 2007.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 HS 003 - TOTAL QUALITY MANAGEMENT								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	2	0	0	45	2	50	50	100
Objective(s)	• To understand the Total Quality Management concept and principles and the various tools available to achieve Total Quality Management, statistical approach for quality control, ISO and QS certification process and its need for the industries.							
Course Outcomes	**At the end of the course, the student will be able to** 1. Recognize the basic concepts of total quality management 2. List the role of senior management. 3. Identify the customer satisfaction, retention and employee involvement. 4. Locate the continuous process improvement techniques. 5. List the seven tools of quality and new seven management tools 6. Demonstrate concept of six sigma. 7. Implement the concept of quality function deployment 8. Assess the total productive maintenance, failure mode and effective analyses 9. Demonstrate the need for ISO 9000 and other quality system. 10. Categorize the quality auditing.							

Introduction

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Quality Council, Quality Statements, Deming Philosophy, Barriers to TQM Implementation.

TQM Principles

Customer satisfaction, Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement, Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership, Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures-Basic Concepts, Strategy.

Statistical Process Control (SPC)

The tools of quality, Statistical Fundamentals, Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma,

TQM Tools

Benchmarking, Reasons to Benchmark, Benchmarking Process, Quality Circle, Quality Function Deployment (QFD). House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM), Concept, Improvement Needs, FMEA–Stages, Types.

Quality Systems

Need for ISO 9000 Quality Systems, ISO 9001:2008 ISO 14000 Quality Systems, Elements Concepts, Implementation, Documentation, Quality Auditing, Requirements and Benefits, Non Conformance report, Case Studies on Educational System.

Text book(s):

1.	Dale H.Besterfiled, et al., “Total Quality Management”, Pearson Education Asia, 1999. (Indian reprint 2002).

Reference(s) :

1.	James R.Evans & William M.Lidsay, “The Management and Control of Quality”, (5th Edition), South-Western (Thomson Learning), 2002.
2.	Feigenbaum.A.V. “Total Quality Management”, McGraw Hill, 1991.
3.	Jayakumar.V, T”otal Quality Management”, Lakshmi Publications, 2006.
4.	Suburaj, Ramasamy “Total Quality Management”, Tata McGraw Hill, 2005.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 5P1 - OPERATING SYSTEMS LABORATORY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
V	0	0	3		2	50	50	100

Objective(s)	• To understanding the concepts of OS and Implement in C through Unix • To design and implement complex data structures and functionality of simple tasks in an operating system. • To provide students with a theoretical and practical knowledge in open source and its applications
Course Outcomes	**At the end of the course, the students will be able to** 1. Implement the basic commands to implement shell programming 2. Demonstrate the basic shell programming using patterns and loops 3. Implement the various system calls commands of UNIX 4. Implement input system calls of UNIX operating system 5. Design the scheduling process using FCFS and SJF scheduling 6. Demonstrate Page replacement policies concept using FIFO method 7. Implement the Best-fit, First-fit algorithms for memory management 8. Gain the knowledge to install open source and open office softwares. 9. Configure User and group creation, DNS, DHCP, Ethernet configuration. 10. Demonstrate the Perl programming using Arithmetic operation, Loop, String, functions

LIST OF EXPERIMENTS

1. Shell programming
   - command syntax
   - write simple functions
   - basic tests
2. Shell programming
   - loops
   - patterns
   - expansions
   - substitutions
3. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
5. 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.
6. Implementation of FIFO page replacement algorithms.
7. Implementation of Best-fit, First-fit algorithms for memory management.
8. Installation of Open Office, Mail client & Web/internet browser and configuration.
9. User Creation and Group Creation.
10. Configuration of DNS, DHCP.
11. Configuration of device like Printer, Ethernet and TCP /IP.
12. Perl programming
    - Arithmetic operation
    - Loop
    - String
    - functions

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 5P2 - DATABASE MANAGEMENT SYSTEMS LABORATORY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
V	0	0	3		2	50	50	100
Objective(s)	• To familiarize the participant with the nuances of SQL environments. • To expose the manipulation of data using PL/SQL blocks. • To present the concepts and techniques relating to ODBC and its implementations							
Course Outcomes	**At the end of the course, the students will be able to** 1. Implement the Data Definition Language commands in RDBMS. 2. Demonstrate the Data Manipulation Language, Data Control Language Commands and Transaction Control Language in RDBMS. 3. Employ the Sub queries to retrieve data from multiple tables. 4. Demonstrate the creation of views and joins. 5. Implement the High-level language extension with Cursors. 6. Demonstrate the High-level language extension with Triggers. 7. Implement the Procedures and Functions in PL/SQL. 8. Implement the embedded SQL. 9. Demonstrate Managing Database storage structures. 10. Design and implement applications using ODBC.							

LIST OF EXPERIMENTS

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML), Data Control Language (DCL) and Transaction Control Language (TCL) commands in RDBMS.
3. Implementation of Sub queries.
4. Creation of views and joins.
5. High-level language extension with Cursors.
6. High level language extension with Triggers
7. Procedures and Functions.
8. Embedded SQL.
9. Managing Database storage structures.
10. Design and implement the following applications using ODBC. (Any 3)
    - Payroll Processing System
    - Banking System
    - Railway Reservation System
    - Inventory Control System
    - Online Retail System
    - Hospital Management System
    - Library Management System
    - Restaurant Management System
    - Blood Donation System
    - ATM System

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 5P3 - NETWORKING LABORATORY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
V	0	0	3		2	50	50	100

Objective(s)	• Study the basic concepts of computer networking and acquire practical notions of protocols with emphasis on TCP and UDP. • be able to analyze a communication system by separating out the different mechanisms provided by the network. • Understand the general principles behind multiplexing, addressing, routing, reliable transmission and security issues. .
Course Outcomes	**At the end of the course, the students will be able to** 1. Implement application using TCP. 2. Implement application using UDP. 3. Analyze and implement flow control mechanism. 4. Analyze and apply error control mechanism. 5. Demonstrate error detection techniques. 6. Analyze and apply error correction techniques. 7. Implement Distance Vector Routing Algorithm to find shortest path. 8. Implement Link State Routing Algorithm to find shortest path. 9. Understand the concept of NS2. 10. Understand the concept of Glomosim.

LIST OF EXPERIMENTS

1. Develop a client-server application for chatting using TCP.
2. Develop a client-server application for chatting using UDP.
3. Implementation of bit stuffing.
4. Implementation of parity checker.
5. Implementation of Check Sum.
6. Implementation of CRC.
7. Simulation of Stop and Wait Protocol Algorithm.
8. Simulation of Sliding Window Protocol Algorithm.
9. Simulation of Distance Vector Routing Algorithm.
10. Simulation of Link State Routing Algorithm.
11. Study of NS2 .
12. Study of Glomosim.

K.S.Rangasamy College of Technology - Autonomous Regulation								R 2014
Department	Information Technology		Programme Code & Name		IT : B.Tech. Information Technology			
Semester V								
Course Code	Course Name	Hours/Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
40 TP 0P3	**CAREER COMPETENCY DEVELOPMENT III**	0	0	2	0	100	00	100
Objective(s)	To enhance employability skills and to develop career competency							

Unit – 1	**Written and Oral Communication – Part 1**	Hrs
Reading Comprehension Level 3 - Self Introduction - News Paper Review - Self Marketing - Debate-Structured and Unstructured GDs Psychometric Assessment – Types & Strategies to answer the questions Practices: Sentence Completion - Sentence Correction - Jumbled Sentences - Synonyms & Antonyms - Using the Same Word as Different Parts of Speech - Interpretation of Pictorial Representations - Editing - GD - Debate. Materials: Instructor Manual, Word power Made Easy Book, News Papers		6
Unit – 2	**Verbal & Logical Reasoning – Part 1**	8
Syllogism - Assertion and Reasons - Statements and Assumptions - Identifying Valid Inferences - identifying Strong Arguments and Weak Arguments - Statements and Conclusions - Cause and Effect - Deriving Conclusions from Passages - Seating Arrangements Practices: Analogies - Blood Relations - Statement & Conclusions Materials: Instructor Manual, Verbal Reasoning by R.S.Aggarwal		
Unit – 3	**Quantitative Aptitude – Part 3**	6
Probability - Calendar- Clocks - Logarithms - Permutations and Combinations Materials: Instructor Manual, Aptitude Book		
Unit – 4	**Quantitative Aptitude – Part 4**	6
Algebra - Linear Equations - Quadratic Equations - Polynomials Practices: Problem on Numbers - Ages - Train - Time and Work - Sudoku - Puzzles Materials: Instructor Manual, Aptitude Book		
Unit – 5	**Technical & Programming Skills**	4
C Language - Control Structures – Data Types – Arrays – Operators -Functions- Structures – Pointers-Files Practices : Programs and Find Output and Errors Materials: Instructor Manual , Exploring C by Yashwant Kanetkar		
	Total	30

Evaluation Criteria

S.No.	Particular	Test Portion	Marks
1	Evaluation 1 Written Test	15 Questions each from Unit 1, 2, 3, 4 & 5 (External Evaluation)	60
2	Evaluation 2 - Oral Communication	GD and Debate (External Evaluation by English, MBA Dept & External Trainers)	20
3	Evaluation 3 – Technical Paper Presentation	Internal Evaluation by the Dept.	20
		Total	100

Reference Books

1. Aggarwal, R.S. “A Modern Approach to Verbal and Non-verbal Reasoning”, Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.
2. Abhijit Guha, “Quantitative Aptitude”, TMH, 3rd edition
3. Objective Instant Arithmetic by M.B. Lal & GoswamiUpkar Publications.
4. Word Power Made Easy by Norman Lewis W.R. GOYAL Publications

Note :

- Instructor can cover the syllabus by Class room activities and Assignments (5 Assignments/week)
- Instructor Manual has Class work questions, Assignment questions and Rough work pages
- Each Assignment has 20 Questions from Unit 1,2,3,4 and 5 and 5 Questions from Unit 1
- Evaluation has to be conducted as like Lab Examination.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
41 IT 602 - WEB TECHNOLOGY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To know various technologies are involved in designing a creative and dynamic website. • Understand the fundamentals of various Scripting languages. • To enhance the knowledge of how hierarchy of objects are used in HTML and XML. • Demonstrate the fundamentals of AJAX and Web Hosting.
Course Outcomes	**At the end of the course, the students will be able to** 1. Categorize the issues in designing a web page by utilizing XHTML components. 2. Classify CSS to control the appearance of web pages 3. Incorporate JavaScript variables, operators and functions in web pages 4. Manipulate HTML forms to validate user inputs 5. Create Web pages with dynamic styles and positions using JavaScript objects and DOM 6. Demonstrate various JavaScript event models 7. Infer simple AJAX applications using Web server 8. Demonstrate the ability to modify, add and delete data in a database through a Web page. 9. Analyze how to create and run applications in different IDE like Net Beans. 10. Classify JSF Components and implement using Net Beans.

INTRODUCTION TO WEB ESSENTIALS

Introduction – History of the Internet and WWW-W3C-Web Browser –Internet explorer & firefox-Customizing browser settings- Rich Internet Applications-web services-location based services-Editing XHTML-First XHTML Example - W3C XHTML Validation Service -Headings -Linking -Images - Special Characters and Horizontal Rules - Lists - Tables - Forms - Internal Linking – meta Elements – Cascading Style Sheets(CSS) - Introduction - Inline Styles - Embedded Style Sheets - Conflicting Styles - Linking External Style Sheets - Positioning Elements - Backgrounds - Element Dimensions - Box Model and Text Flow - Media Types - Building a CSS Drop-Down Menu - User Style Sheets.

CLIENT SIDE PROGRAMMING

Introduction - Simple Program- Obtaining User Input with prompt Dialogs - Memory Concepts - Arithmetic - Decision Making- Control Structures - Selection Statement - Repetition Statement - Program Modules in JavaScript – Programmer Defined Functions - Function Definitions - Random Number Generation - Examples - Scope Rules - JavaScript Global Functions - Recursion - Recursion vs. Iteration - Arrays - Examples – Reference and Reference Parameters - Passing Arrays to Functions - Sorting and Searching - Multidimensional Arrays.

JAVASCRIPT: OBJECTS

Introduction - Introduction to Object Technology - Math Object - Date Object - Boolean and Number Objects - document Object - window Object - Using Cookies - JavaScript Example - Using JSON to Represent Objects - DOM - Modeling a Document: DOM Nodes and Trees -Traversing and Modifying a DOM Tree -DOM Collections - Dynamic Styles - Javascript Events - Registering Event Handlers -Event onload- Event onmousemove , Rollovers with onmouseover and onmouseout - Form Processing with onfocus, onblur onsubmit and onreset - Event Bubbling.

WEB SERVERS AND PHP

Introduction - Traditional Web Applications vs. Ajax Applications - Rich Internet Applications (RIAs) with Ajax History of Ajax - "Raw" Ajax Example Using the XMLHttpRequest Object - Web servers - HTTP Transactions - Multitier Application Architecture - Client-Side Scripting versus Server-Side Scripting Accessing Web Servers Microsoft Internet Information Services (IIS) - Apache HTTP Server - Requesting Documents – PHP - Basics - String Processing and Regular Expressions – Form Processing and Business Logic - Connecting to a Database - Using Cookies - Dynamic Content - Operator Precedence Chart.

WEB APPLICATIONS

Java web technologies – Creating and Running web applications in Net beans – JSF Components – Java Server Pages, Servlet – Accessing databases in Web Applications – web hosting - Case Studies.

Text book(s):

1. Deitel & Deitel, "Internet and World Wide Web – How to Program", 5th ed., Pearson Education Asia, 2011.

Reference(s) :

1. Robert. W. Sebesta, "Programming the World Wide Web", 8th Edition, Pearson Education, 2015.
2. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2007

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 603 - DATA MINING AND ANALYTICS								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To serve as an introductory course to under graduate students to learn the fundamental concepts and modern techniques for data mining • To focus on the key tasks of data mining, including data preparation and of data warehousing with special emphasis on architecture and design, analyze and solve key tasks of data mining, including data preparation, classification, clustering, association rule mining, outliers and evaluation. • To explore the fundamental concepts of big data analytics
Course Outcomes	At the end of the course, the students will be able to 1. Classify data mining and discover the attribute types. 2. Infer data mining applications, challenges, analytical dispersion of data and analyze data similarity and dissimilarity. 3. Apply and solve real-time problems using data pre-processing steps. 4. Design Warehouse models and implement the same for organizational requirements. 5. Compare and contrast pattern mining techniques. 6. Analyze pattern mining methods to extract frequent itemsets. 7. Categorize the classifiers and apply the same to large datasets. 8. Analyze clustering and outlier analysis techniques and implement for real-world problems. 9. Classify analytic tools and identify the nature of data. 10. Predict the data using analytics tools.

INTRODUCTION

Introduction - Data Mining - Kinds of Data and Pattern - Technologies - Applications - Issues - Data Objects and Attribute types - Basic Statistical Descriptions of Data - Measuring Data Similarity and Dissimilarity.

DATA PREPROCESSING, DATA WAREHOUSING

Data Preprocessing - Overview - Cleaning - Integration - Reduction - Transformation - Data Discretization - Data Warehouse - Basic Concepts - Data Warehouse Modeling - Data Warehouse Design and Usage - Data Warehouse Implementation.

PATTERN MINING

Basic Concepts - Frequent Itemset Mining Methods - Pattern Evaluation Methods - Pattern Mining - A Road Map - Pattern Mining in Multilevel, Multidimensional Space.

CLASSIFICATION, CLUSTERING AND OUTLIERS

Classification - Basic Concepts - Decision Tree Induction - Bayes Classification Methods - Bayesian Belief Networks - Classification by Back propagation - Support Vector Machines - Clustering - Cluster Analysis - Partitioning Methods - Hierarchical Methods - Outliers and Outlier Analysis - Outlier Detection Methods - Statistical Approaches.

DATA ANALYTICS

Introduction to Big Data Platform - Challenges of Conventional Systems - Intelligent data analysis - Nature of Data - Analytic Processes and Tools - Analysis Vs Reporting - Modern Data Analytic Tools - Statistical Concepts - Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

Text book(s):

1.	Jiawei Han, Micheline Kamber, Jian Pei, “Data Mining: Concepts and Techniques”, 3rd Edition, Morgan Kaufmann Publishers, 2012.

Reference(s) :

1.	Michael Berthold, David J. Hand, “Intelligent Data Analysis”, 2nd Edition, Springer, 2007.
2.	Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, 2nd Edition, Cambridge University Press, 2014.
3.	David Hand, Heikki Manila, Padhraic Symth, “Principles of Data Mining”, Eastern Economy Edition PHI 2012.
4.	Margaret H.Dunham, “Data Mining: Introductory and Advanced Topics”, 2nd Edition, Pearson Education, 2007

K.S. RANGASAMY COLLEGE OF TECHNOLOGY – AUTONOMOUS								
40 IT 604 - WIRELESS TECHNOLOGIES								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To learn the basics of Wireless voice and data communications technologies. • To build working knowledge on various Cellular and Satellite Networks. • To study the working principles of wireless LAN, Wireless MAN and its standards. • To know about various Mobile Computing Algorithms. • To learn about Wireless Application Protocols
Course Outcomes	**At the end of the course, the students will be able to** 1. Recognize the facts about signals, radio transmission 2. Identify different communication systems. 3. Compare the generations of digital cellular network. 4. Analyze different cellular networks. 5. Recognize the role of Wireless LAN technologies its system and protocol architecture 6. Identify the importance of WMAN technologies 7. Examine the use of Mobile IP. 8. Identify the various routing mechanisms in wireless networks 9. Analyze the improvements in TCP 10. Examine the WAP for wireless networks

WIRELESS COMMUNICATION FUNDAMENTALS

Introduction – Wireless transmission – Frequencies for radio transmission – Signals — Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA –Satellite Systems- Broadcast Systems – DAB - DVB.

DIGITAL CELLULAR TECHNOLOGY

Generation of Cellular Wireless Networks - GSM – GPRS –DECT– EDGE– UMTS – IMT-2000.

WIRELESS NETWORKING TECHNOLOGIES

Wireless LAN – IEEE 802.11 Family – Architecture – services – MAC – Physical layer – WiFi–Introduction- HIPERLAN 1 – Blue Tooth-Broad Band Technologies–WiMAX–Protocol Architecture– Long Term Evolution Advanced

MOBILE NETWORK LAYER

Mobile IP – Dynamic Host Configuration Protocol – Routing – DSDV – DSR – Least Interference Routing– Hierarchical–Geographic Position Assisted Ad Hoc Routing.

TRANSPORT AND APPLICATION LAYERS

Traditional TCP – Classical TCP improvements – WAP

Text book(s):

1. Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, 2nd Edition, 2008.

Reference(s) :

1. Misra,”Wireless Communications and Networks 3G and Beyond”,MC Graw Hill Education,2014.
2. T L Singal,”Wireless Communications”,MC Graw Hill Education,2014.
3. Kaveh Pahlavan, Prasanth Krishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
4. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York, 2015.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 605- CRYPTOGRAPHY AND NETWORK SECURITY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	1	0	60	4	50	50	100

Objective(s)	• To understand the principles of encryption algorithms, conventional and public key cryptography, have a detailed knowledge about authentication, hash functions and application level security mechanisms. • To know the methods of conventional encryption, understand the concepts of public key encryption and number theory. • Understand authentication and Hash functions, know the network security tools and applications, understand the system level security used.
Course Outcomes	**At the end of the course, the students will be able to** 1.Realize the OSI (open system interconnection) architecture framework for defining security attacks and various data encryption standards. 2.Realize the knowledge about Block Cipher design principles, Advanced Encryption Standard, and reliable transfer of keys between two users. 3.Recognize with Elliptic curve architecture which helps to learn the drawbacks over RSA algorithm. 4.Analyze the knowledge about the confidentiality factors and symmetric encryption techniques. 5.Realize the study of ensuring the right user from accessing a particular system and to discover about a function that used to produce an authenticator. 6.Know the authentication and confidentiality hash function and to expel the third party penetration in a mail transfer between two parties 7.Recognize the authentication application and about Electronic mail security 8.Realize about the various IP security and Web security principles 9.Identify the behaviors of intruders, authorized users and principles of password management 10.Identify various kinds of virus and threats and learn about the firewall principles and techniques

INTRODUCTION

OSI Security architecture – Classical encryption techniques – Cipher principles – Data Encryption Standard – Block cipher design principles– Advanced Encryption standard– Block cipher operation

NUMBER THEORY AND PUBLIC KEY CRYPTOGRAPHY.

Introduction to Number Theory: Prime Numbers, Fermat's and Euler's Theorem – Chinese remainder theorem - key management – Key distribution - Distribution of public keys - Public-Key Cryptography and RSA – Diffie-Hellman Key Exchange – Elliptic Curve Arithmetic – Elliptic Curve Cryptography.

AUTHENTICATION AND DATA INTEGRITY ALGORITHMS

Application of cryptographic Hash functions – Requirements and Security of hash functions –Secure Hash Algorithm – Message authentication codes – Authentication requirements – Authentication functions – HMAC - Digital signatures – Digital Signature Standard.

NETWORK AND INTERNET SECURITY

User Authentication – Authentication principles –Authentication using symmetric encryption – Kerberos – Electronic mail security – PGP – S/MIME – IP security–IP security over view– IP security policy.

SYSTEM SECURITY

Intrusion detection – password management – Viruses and related Threats – Virus counter measures – Firewall design principles – Trusted systems.

Text book(s):

1.	William Stallings, "Cryptography And Network Security – Principles and Practices", 6th Edition, Prentice Hall of India, 2014.

Reference(s) :

1.	Atul kahate, "Cryptography and Network Security", Tata Mc Hill, 2012.
2.	Wade Trappe, Lawrence C Washington, "Introduction to Cryptography with coding theory", 2nd edition, Pearson Education, 2007.
3.	W. Mao, "Modern Cryptography – Theory and Practice", 2nd Edition, Pearson Education, 2007

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 606 –PROGRAMMING USING PYTHON								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To know basic programming in Python • To understand modules along with object oriented programming concepts • To know database programming, network programming and graphics Programming
Course Outcomes	**At the end of the course, the students will be able to** 1. Apprehend the basics of Python programming 2. Comprehend the decision making and looping in Python 3. Infer module concepts with package importing 4. Expel functions with various types of message passing and handling exceptions 5. Acquire basics of object oriented programming 6. Implement OOP concepts using Python 7. Comprehend database management and implementing DB connectivity 8. Expel network programming like client server and chat application 9. Identify GUI toolkits like Tkinter 10. Configure various widgets in layout

INTRODUCTION

Introduction to Python – Strings – List – Tuples – Dictionaries – Basic Operators – Decision Making statements – Looping statements - File Input and Output

MODULAR DESIGN AND EXCEPTION HANDLING

Modules in Python – Creation of modules - Namespaces – Importing modules – Loading and Execution ; Program Routine – Functions – Parameter Passing - Types – Recursion ; Exceptions – Types – Handling Exceptions - User Defined Exceptions

OBJECT ORIENTED PROGRAMMING

Object Oriented Programming – Class and Objects – Data Abstraction - Encapsulation – Inheritance – Polymorphism - Implementation

DATABASE CONNECTIVITY AND NETWORK PROGRAMMING

Introduction to database – Relational Databases : Writing SQL statements; Defining tables; Setting up a Database – Python database APIs – Network Protocols – Socket Programming – Client Server Program – Chat Application

GUI PROGRAMMING AND GRAPHICS

GUI Programming toolkits – Introduction to Tkinter – Creating GUI widgets – Resizing – Configuring widget options – Creating Layouts – Radio buttons – Check boxes – Dialog boxes – Drawing using Turtle

Text book(s):

1	James Payne, “Beginning Python – using Python 2.6 and Python 3.1”, Wiley India Pvt Ltd, 2010
2	Charles Dierbach, “Introduction to Computer Science using Python”, Wiley India Pvt Ltd, 2015

Reference(s):

1	Wesley J. Chun, “Core Python Applications Programming”, 3rd Edition, Pearson Education, 2013
2	John Paul Mueller, “Beginning Programming with Python”, Wiley India Pvt Ltd, 2014
3	Allen Downey, Jeffrey Elkner, Chris Meyers, “ Learning with Python”, DreamTech Press, 2015

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 6P2 - DESIGN PROJECT LABORATORY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
VI	0	0	3		2	50	50	100

Objective(s)	• To develop an ability to design and implement static and dynamic website with good aesthetic sense of designing and latest technical know-how's. • To apply various web and scripting languages such as HTML, CSS, JavaScript and VB Script. • Design and Develop a Website using good grounding of Web Application Terminologies, Internet Tools, E – Commerce and other web services.
Course Outcomes	**At the end of the course, the students will be able to** 1. Understand the problem and identify the software requirements 2. Analyze and apply the role of client side technologies like HTML, DHTML, CSS, XML, ASP, PHP and protocols in the workings of the web and web applications 3. Create web pages using HTML, DHTML and Cascading Styles sheets. 4. Construct dynamic web pages using JavaScript and VBScript (client side programming). 5. Examine the skill to write a program for server side technology 6. Capable to connect the server side technology with database 7. Demonstrate a program to create user sessions and session management. 8. Identify how to create a website using Secure Electronic Transaction 9. Categorize the steps involved in testing web sites. 10. Upload/publish a web site to a domain named host web site location

LIST OF EXPERIMENTS

Select a domain and follow the steps given below:

1. Identify the Problem.
2. Specify Software Requirements.
3. Make a Simple static web page using HTML Tags.
4. Apply Cascading Style Sheet and enhance the design of web pages.
5. Translate the static web page as dynamic web page with validation using JavaScript.
6. Identify appropriate server side technology that suits the web site design.
7. Design the website which accepts dynamic response from the user and process the user inputs with appropriate server side technology and database. Use any of the following concepts: User Sessions, Transaction Management, Sessions and session Management, Maintaining state information, Transaction Processing monitors – object Request Brokers, cryptography, Digital signature, Digital certificates, Security Socket Layer (SSL), Credit card Processing Models, Secure Electronic Transaction, and 3D Secure Protocol.
8. Deploy the developed system as a web service.

SUGGESTED WEB LANGUAGES:

HTML, XHTML, ASP.NET, JAVASCRIPT, PHP, PYTHON, etc.,

SUGGESTED WEB DEVELOPMENT TOOLS:

NET BEANS, .NET FRAMEWORK, etc.,

K.S. RANGASAMY COLLEGE OF TECHNOLOGY – AUTONOMOUS								
40 IT 6P3 - SOFTWARE TOOLS LABORATORY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
VI	0	0	3		2	50	50	100
Objective(s)	• To implement algorithms of data mining tasks using tools. • To recognize and simulate wired networks • To identify and simulate different wireless networks							
Course Outcomes	**At the end of the course, the students will be able to** 1. Apply data mining techniques and methods to mine frequent itemsets in large data sets. 2. Analyze frequent item set mining methods to extract patterns. 3. Compare and contrast the various classifiers. 4. Apply and solve problems using classification methods. 5. Analyze clustering technique and implement for large data sets. 6. Analyze the performance of Wired network 7. Simulate scenarios for wireless network 8. Analyze the performance of MAC layer protocol 9. Recognize the importance of Wi-Fi network 10. Design the wireless sensor network							

LIST OF EXPERIMENTS

1. Implementation Apriori algorithm.
2. Implementation of FP-growth algorithm.
3. Implementation of Decision tree algorithm.
4. Implementation of Bayesian classification algorithm.
5. Implementation of K-means algorithm.
6. Simulate Implementation of Multicast routing(IGMP).
7. Simulate Congestion control in TCP.
8. Simulate Wired Network.
9. Simulate Wireless LAN in ad hoc mode.
10. Simulate MAC layer protocol.
11. Simulate WiFi Network.
12. Simulate Wireless Sensor Network.

SUGGESTED SOFTWARE TOOLS: R, RapidMiner, WEKA , MATLAB, Qualnet, NS2 etc.,

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT 6P4 - PYTHON PROGRAMMING LABORATORY

IT

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
VI	0	0	3		2	50	50	100

Objectives	• To design and implement simple linear and non linear data structures • To strengthen the ability to identify and apply the suitable data structure for the given real world problem • To gain knowledge of graph applications
Course Outcomes	**At the end of the course, the students will be able to** 1. Implement basic programming with operators 2. Apply control structures for problem solving 3. Acquire data from a file and updating its contents 4. Importing modules and designing own modules 5. Understand functions and its implementation in programming 6. Handle exceptions arising and implement user defined exception handling 7. Utilise object oriented concepts for program development 8. Implement database connectivity for Python 9. Design basic network applications 10. Design graphics using Tkinter and Turtle

LIST OF EXPERIMENTS

1. Implementation of different types of structures and operators in python
2. Implementation of Control structures in Python program
3. Implementation of File operations with read and write
4. Implementation of Modules and packages
5. Implementation of concepts of functions scoping, recursion
6. Implementation of Exception handling in program
7. Develop a program with object for a defined class
8. Implementation of Inheritance of class
9. Implementation of Polymorphism (overloading, overriding) in program
10. Design an application with DB connectivity
11. Develop chat room application using multithreading
12. Implement client server application
13. Develop a program with GUI widgets using Tkinter
14. Draw graphics using Turtle

K.S.Rangasamy College of Technology - Autonomous Regulation								R 2014
Department	Information Technology	Programme Code & Name			IT: B.Tech. Information Technology			
Semester VI								
Course Code	Course Name	Hours/Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
40 TP 0P4	**CAREER COMPETENCY DEVELOPMENT IV**	0	0	2	0	100	00	100
Objective(s)	To enhance employability skills and to develop career competency							

Unit – 1	**Written and Oral Communication – Part 2**	Hrs
Self Introduction – GD - Personal Interview Skills Practices on Reading Comprehension Level 2 – Paragraph Writing - News paper and Book Review Writing - Skimming and Scanning – Interpretation of Pictorial Representations - Sentence Completion - Sentence Correction - Jumbled Sentences - Synonyms & Antonyms - Using the Same Word as Different Parts of Speech - Editing Materials: Instructor Manual, Word power Made Easy Book, News Papers		4
Unit – 2	**Verbal & Logical Reasoning – Part 2**	8
Analogies – Blood Relations – Seating Arrangements – Syllogism - Statements and Conclusions, Cause and Effect – Deriving Conclusions from Passages – Series Completion (Numbers, Alphabets & Figures) – Analytical Reasoning – Classification – Critical Reasoning Practices: Analogies – Blood Relations - Statement & Conclusions Materials: Instructor Manual, Verbal Reasoning by R.S.Aggarwal		
Unit – 3	**Quantitative Aptitude - Part – 5**	6
Geometry - Straight Line – Triangles – Quadrilaterals – Circles – Co-ordinate Geometry – Cube – Cone – Sphere. Materials: Instructor Manual, Aptitude book		
Unit – 4	**Data Interpretation and Analysis**	6
Data Interpretation based on Text – Data Interpretation based on Graphs and Tables. Graphs can be Column Graphs, Bar Graphs, Line Charts, Pie Chart, Graphs representing Area, Venn Diagram & Flow Charts. Materials: Instructor Manual, Aptitude Book		
Unit – 5	**Technical & Programming Skills – Part 2**	6
Programming Language C++ - Classes – Objects – Polymorphism – Inheritance – Abstraction		
	Total	30

Evaluation Criteria

S.No.	Particular	Test Portion	Marks
1	Evaluation 1 Written Test	15 Questions each from Unit 1, 2, 3, 4 & 5 (External Evaluation)	60
2	Evaluation 2 - Oral Communication	GD and HR Interview (External Evaluation by English, MBA Dept.)	20
3	Evaluation 3 – Technical Interview	Internal Evaluation by the Dept. – 3 Core Subjects	20
		Total	100

Reference Books

1. Aggarwal, R.S. “A Modern Approach to Verbal and Non-verbal Reasoning”, Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.
2. Abhijit Guha, “Quantitative Aptitude”, TMH, 3rd edition
3. Objective Instant Arithmetic by M.B. Lal & GoswamiUpkar Publications.
4. Word Power Made Easy by Norman Lewis W.R. GOYAL Publications

Note:

- Instructor can cover the syllabus by Class room activities and Assignments (5 Assignments/week)
- Instructor Manual has Class work questions, Assignment questions and Rough Work pages
- Each Assignment has 20 questions from Unit 1,2,3,4,5 and 5 questions from Unit 1(Oral Communication) & Unit 5(Programs)
- Evaluation has to be conducted as like Lab Examination.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY – AUTONOMOUS								
40 IT E11 - HIGH PERFORMANCE NETWORKS								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To understand the relationship between the TCP/IP protocol machine architecture. • To design and implement the Internet routing protocols. • To learn the phases of the congestion control and traffic management system. • To design protocol with QOS parameter and Network Optimization..
Course Outcomes	**At the end of the course, the students will be able to** 1. Recall the relationship between TCP/IP Protocol Architecture and ATM architecture. 2. Analyze the High speed LAN and Ethernet designs with fiber channel. 3. Design internet routing protocol. 4. Analyze and design Exterior and Multicast Routing Protocol. 5. Analyze the reason for congestions 6. Design congestion control mechanisms. 7. Recall the concepts of integrated service parameters. 8. Design different Queuing disciplines with differentiated services. 9. Analyze the protocols for QOS support. 10. Demonstrate QOS protocols such as RSVP and MultiProtocol Label Switching.

FRAME RELAY NETWORK AND ATM

TCP and IP protocol architecture–applications–Frame Relay Networks–Asynchronous transfer mode–ATM Protocol Architecture–ATM logical Connection–ATM Cell–ATM Service Categories–High Speed LANs–Fast Ethernet–Gigabit Ethernet–Fiber Channel.

INTERNET ROUTING PROTOCOLS

Internet Routing Principles– Distance Vector Routing–RIP– Link State Routing with OSPF–Path-Vector protocols–BGP And IDRP– Multicast Routing–Requirements for Multicasting–Internet Group Management Protocol.

CONGESTION AND TRAFFIC MANAGEMENT

Effects of Congestion –Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control – TCP Flow control – TCP Congestion Control – Retransmission.

INTEGRATED AND DIFFERENTIATED SERVICES

Integrated Services Architecture – Approach – Components Services– Queuing Discipline–FQ–PS– BRFQ–GPS– WFQ – Random Early Detection– Differentiated Services–QOS Parameters.

QOS SUPPORT PROTOCOLS

RSVP – Goals & Characteristics–Data Flow– RSVP operations– Protocol Mechanisms – Multiprotocol Label Switching – Operations–Label StackingProtocol details.

Text book(s):

1.	William Stallings, “High Speed Networks And Internet”, Pearson Education, 2nd Edition, 2002.

Reference(s) :

1.	Warland, Pravin Varaiya, “High performance communication networks”, 2nd Edition , Jean Harcourt Asia Pvt. Ltd. 2001.
2.	Irvan Pepelnjk, Jim Guichard, Jeff Apcar, “MPLS and VPN architecture”, Cisco press, Volume 1 and 2, 2003.
3.	Abhijit S. Pandya, Ercan Sea, “ATM Technology for Broad Band Telecommunication Networks”, CRC Press, New York, 2004.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E12 - DISTRIBUTED COMPUTING								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To understand the concept of distributed computing. To know the issues of operating systems. • To understand the concept of distributed processing. • To understand the concept of distributed file system.
Course Outcomes	**At the end of the course, the students will be able to** 1. Attain the knowledge in the hardware concepts of distributed systems. 2. Gain the expertise in the software concepts and design issues of distributed systems. 3. Conquer the knowledge about the layered protocols and ATM networks. 4. Reach the proficiency in the client-server model, RPC and group communication. 5. Recognize the importance and learn the algorithms for synchronization in distributed systems. 6. Conquer the knowledge about threads, processes and processor allocation in distributed systems. 7. Attain the knowledge in the semantics and interface design of distributed file system. 8. Reach the proficiency in the trends and implementation of distributed file system. 9. Attained the handiness about the consistency and sharing of memory in distributed systems. 10. Acquired the knowledge about the distributed programming languages and various case studies about the distributed systems.

INTRODUCTION

Introducing- Goals – hardware concepts- bus based multiprocessor- switched multiprocessor – bus based multicomputer – switched multicomputer – software concepts – network operating system – True distributed system – Multiprocessor time sharing system – design issues – transparency – Flexibility – reliability – Performance and Scalability.

PROCESSES AND DISTRIBUTED OBJECTS

Communication – Layered Protocols - ATM networks – Client server model – remote procedure call – group communication.

OPERATING SYSTEM ISSUES – I

Synchronization – Clock Synchronization – Mutual Exclusion – Election Algorithms – Atomic transaction – Deadlock – Threads – System models – Processor Allocation – Scheduling – fault tolerance – Real time system.

OPERATING SYSTEM ISSUES – II

Distributed file systems Distributed file system design – implementation – file models – fault tolerance - file replication –multimedia.

DISTRIBUTED PROCESSING

Distributed shared memory - consistency models – page based distributed shared memory – shared variable distributed shared memory – Distributed programming languages – case studies.

Text book(s):

1. Andrew S.Tanenbaum,"Distributed Operating Systems", Pearson Education Asia, 2008.

Reference(s) :

1. Mukesh singhal and niranjan G.Shivaratri, "Advanced concepts in Operating system, Tata McGraw Hill.
2. Pradeep.k and Sinha," Distributed operating systems,PHI, Newdelhi, 2001

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E13 - SOFT COMPUTING								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To familiarize with the fundamental concepts of soft computing • To enhance the knowledge of neural networks and fuzzy logic • To introduce the concepts of Genetic algorithm and its applications to soft computing for real time problems
Course Outcomes	**At the end of the course, the students will be able to** 1. Realize the scope and various components of soft computing. 2. Identify the fundamentals, terminologies, evolution and models of neural network. 3. Build the architecture, flowchart and testing algorithm of supervised learning network. 4. Build the architecture, flowchart and testing algorithm of unsupervised learning network. 5. Explain the definition, various operations and properties of classical and fuzzy sets. 6. Identify the basic concepts of fuzzy arithmetic, view on fuzzy integrals and a description on probability, possibility and necessity measures. 7. Apprehend the terminologies, constraints and basic operators used in genetic algorithm. 8. Recognize the classifications and applications of genetic algorithm. 9. Explain the various applications of soft computing using genetic algorithms. 10. Grasp knowledge to develop hybrid fuzzy controllers using soft computing techniques.

INTRODUCTION

Soft computing – Components of soft computing- Neural networks - fuzzy logic - genetic algorithms - hybrid systems – Artificial neural network - Introduction - characteristics- learning methods - taxonomy - Evolution of neural networks- basic models - important terminologies - McCulloch-Pitts neuron - linear separability - hebb network.

SUPERVISED AND UNSUPERVISED LEARNING NETWORKS

Supervised learning network - perceptron networks - adaptive linear neuron - multiple adaptive linear neuron - BPN - RBF - TDNN – Unsupervised learning networks - Kohonen self-organizing feature maps, LVQ – Counter propagation networks, ART network - MATLAB Neural Network Toolbox.

FUZZY LOGIC

Fuzzy logic: Introduction - crisp sets- fuzzy sets - crisp relations and fuzzy relations: Cartesian product of relation - classical relation, fuzzy relations, tolerance and equivalence relations, non-iterative fuzzy sets - fuzzification - defuzzification: lambda cuts – methods - Fuzzy arithmetic and fuzzy measures: fuzzy arithmetic - extension principle - fuzzy measures - measures of fuzziness - fuzzy integrals - Neuro fuzzy modeling: Adaptive Neuro-fuzzy inference systems - Architecture - Hybrid learning algorithm - Learning methods that cross-fertilize ANFIS and RBFN – Fuzzy Logic MATLAB Toolbox.

GENETIC ALGORITHMS

Traditional optimization and search techniques - Genetic algorithm and search space - general genetic algorithm – operators - stopping condition – constraints - classification - genetic programming – advantages and limitations – applications – Genetic Algorithm MATLAB Toolbox.

APPLICATIONS

Introduction: A fusion approach of multispectral images with SAR - optimization of traveling salesman problem using genetic algorithm approach - soft computing based hybrid fuzzy controllers.

Text book(s):

1.	S.N.Sivanandam and S.N.Deepa, "Principles of Soft Computing" 2nd Edition, Wiley India Pvt Ltd, 2011.

Reference(s) :

1.	David E. Goldberg, “Genetic Algorithm in Search Optimization and Machine Learning” 2nd Edition, Pearson Education India, 2013.
2.	Simon Haykin, “Neural Networks and learning machines” 3rd Edition, Prentice Hall, 2011.
3.	J.S.R.Jang, C.T. Sun and E.Mizutani, “Neuro-Fuzzy and Soft Computing” 1st Edition, PHI / Pearson Education 2004.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E14 - SOFTWARE QUALITY MANAGEMENT								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• Be familiar with the Software quality models, Quality measurement and metrics techniques. • To focus on the key methods of Quality plan, documentation, Quality tools, Quality control and reliability of quality process. • To enhance the knowledge of Quality management system models, Complexity metrics, customer Satisfaction and International quality standards.
Course Outcomes	**At the end of the course, the students will be able to** 1. Recognize the basic concepts of Software Quality and measurement. 2. Analyze the Gilb's approach using a quality based GQM Model. 3. Acquire the acquaintance about Quality tasks based measurement. 4. Apply quality Implementation, Documentation, reviews and audits Techniques 5. Obtain information on Tools for Quality, CASE tools and defect prevention and removal. 6. Learn and analyze the reliability growth models and Raleigh model for quality assessment. 7. Grasp knowledge on Elements of QMS and Rayleigh model framework of QMS. 8. Apprehend the terminologies of Complexity metrics and Customer satisfaction analysis of QMS 9. Comprehend various standards of ISO 9000 Series and ISO9003 10. Realize the models of CMM, CMMI and six sigma for QMS

INTRODUCTION TO SOFTWARE QUALITY

Software Quality – Hierarchical models of Boehm and McCall – Quality measurement – Metrics measurement and analysis – Gilb's approach – GQM Model

SOFTWARE QUALITY ASSURANCE

Quality tasks – SQA plan – Teams – Characteristics – Implementation – Documentation – Reviews and Audits.

QUALITY CONTROL AND RELIABILITY

Tools for Quality – Ishikawa's basic tools – CASE tools – Defect prevention and removal – Reliability models – Rayleigh model – Reliability growth models for quality assessment

QUALITY MANAGEMENT SYSTEM

Elements of QMS – Rayleigh model framework – Reliability Growth models for QMS – Complexity metrics and Models – Customer satisfaction analysis.

QUALITY STANDARDS

Need for standards – ISO 9000 Series – ISO 9000-3 for software development – CMM and CMMI – Six Sigma Concepts.

Text book(s):

1.	Allan C. Gillies, "Software Quality: Theory and Management", 3rd edition, Thomson Learning, 2011.
2.	Stephen H. Kan, "Metrics and Models in Software Quality Engineering", 2nd edition, Addison Wesley Professional, 2014.

Reference(s) :

1.	Norman E. Fenton and Shari Lawrence Pfleeger, "Software Metrics" Thomson, 2003
2.	Mordechai Ben – Menachem and Garry S.Marliss, "Software Quality", Thomson Asia Pte Ltd, 2003.
3.	Mary Beth Chrissis, Mike Konrad and Sandy Shrum, "CMMI", Pearson Education (Singapore) Pte Ltd, 2003.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E15 - DATABASE ADMINISTRATION								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To study the design and implementation of relational database solutions • To study the database script development for data manipulation and database administration • To understand and perform database administration tasks, such as database monitoring, performance tuning, data transfer and security.
Course Outcomes	**At the end of the course, the students will be able to** 1. Realize the scope and various components of Database Administration. 2. Identify the fundamentals, terminologies, evolution and models of Database Administration. 3. Discover the ideas in designing the databases and applications. 4. Implement the performance design for the change management. 5. Gain expertise in handling data availability and automating DBA functions. 6. Identify the basic concepts of storage, concurrency and availability for performance management by tuning. 7. Act upon security Administration to protect data integrity. 8. Perform risk assessments to determine the effectiveness of security measures. 9. Apply techniques for collecting and storing data and analyzing information systematically. 10. Execute database administration in networked and distributed environment.

INTRODUCTION

Database Administration – DBA Tasks – Types – Impact of newer technologies – Creating the database environment – Defining the DBMS strategy – Installing the DBMS – Data modeling and normalization – Entity relationship diagramming – Components – Data Models – Normalization.

DATABASE AND APPLICATION DESIGN, CHANGE MANAGEMENT

Logical model to physical database – Database performance design – Denormalization – Views – Temporal Data Support – Database application development and SQL – Defining Transactions – Locking - Batch processing – Requirements – Types – Impacts.

DATA AVAILABILITY, PERFORMANCE MANAGEMENT

Availability – Problems - Downtime cost – Routine maintenance – Automate DBA functions – Defining performance management – Monitoring versus Management - Performance tuning – Types – Tools – Optimizing databases – Techniques – Database reorganization – Relational optimization SQL coding and tuning for efficiency – Data integrity – Structure, semantic data integrity.

DATABASE SECURITY, REGULATORY COMPLIANCE AND ADMINISTRATION

Data Breaches – Users – Granting and revoking authority – Roles and groups – SQL Injection - Auditing - Meta data management – Data masking – Database archiving for long-term data retention – Backup – Recovery – Alternative to backup and recovery – Disaster planning .

DATA STORAGE AND CONNECTIVITY

Files and data sets – Space management – Storage options – Planning for the future – Loading and unloading – Bulk data movement – Distributed Databases – Multitier, distributed computing – Network traffic – Internet-connected databases – Web services – Meta data management.

Text book(s):

1.	Craig S. Mullins, "Database Administration: The Complete Guide to DBA Practices and Procedures", Addison-Wesley Professional, 2nd Edition, 2013.

Reference(s) :

1.	Sam R. Alapati, “Expert Oracle Database 11g Administration”, Apress, 2012.
2.	Thomas Connoly and Carlolyn Begg, “Database Systems, A Practical Approach to Design, Implementation and Management”, 6th Edition, Pearson Education 2014.
3.	Dennis Shasha and Philippe Bonnet, “Database Tuning, Principles, Experiments and Troubleshooting Techniques”, Elsevier Reprint 2005.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E16 - DISCRETE AND NUMERICAL METHODS								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To develop the logical skills for solving program language problems. • To impart the basic concepts of sets, relation and recurrence relation. • To gain the knowledge of graph theory networks. • To give an ability to apply Numerical technique for solving engineering problems.
Course Outcomes	**At the end of the course, the students will be able to :** 1. Study the concepts of symbolic form and logical equivalence. 2. Understand the concepts of inference theory and universal rules. 3. Augment the knowledge of set concepts, ordered pairs and Cartesian product. 4. Understand the different form of the relation, function and its inverse. 5. Classify the different types of graphs and minimum spanning tree. 6. Explore the basic concepts of network graph theory. 7. Solve the system of linear equations in direct methods. 8. Solve the system of linear equations in indirect technique. 9. Apply different technique to evaluate integration. 10. Compute different technique to solve differential equations.

PROPOSITIONAL CALCULUS

Propositions – Logical connectives – Compound propositions – Conditional and biconditional propositions – Truth tables – Tautologies and contradictions – Logical equivalences and implications – Normal forms – Principal conjunctive and disjunctive normal forms – Rules of inference – Arguments - Validity of arguments - Predicates – Logical equivalences and implications for quantified statements – Theory of inference – The rules of universal specification and generalization – Validity of arguments.

SET THEORY

Basic concepts – Notations – Subset – Algebra of sets – The power set – Ordered pairs and Cartesian product – Relations on sets –Types of relations and their properties – Relational matrix and the graph of a relation – Equivalence relations – Recurrence relations – Generating function to solve recurrence relation.

GRAPH THEORY

Introduction of graph – Types of network graph theory- Sub graph with graph elements- graph theory with minimum spanning tree- shortest path algorithm -Depth first search algorithm-Clustering algorithm for network graph theory.

SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS

Linear interpolation methods (method of false position) - Newton's method - Solution of linear system of Gaussian elimination and Gauss-Jordan methods - Iterative methods: Gauss Jacobi and Gauss – Seidel methods- Inverse of a matrix by Gauss-Jordan method. Eigen value of a matrix by power methods.

NUMERICAL DIFFERENTIATION AND INTEGRATION

Numerical integration by Trapezoidal and Simpson's 1/3 and 3/8 rules - Romberg's method - Two and three point Gaussian quadrature formulas - Taylor Series methods - Euler and Modified Euler methods - Fourth order Runge-Kutta method for solving first order equations.

Text book(s):

1.	Subramaniam. N., "Discrete Mathematics" SCM Publications, Erode, 3rd edition, 2010.
2.	Kandasamy, P.Thilakavthy, K and Gunavathy, K, " Numerical Methods", S.Chand and Co. New Delhi, 1999.

Reference(s) :

1.	Bernard Kolman, Robert C. Busby, Sharan Cutler Ross, "Discrete Mathematical Structures", 4th Indian reprint, Pearson Education Pvt Ltd., New Delhi, 2003.
2.	Kenneth H.Rosen, "Discrete Mathematics and its Applications", 5th Edition, Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2003.
3.	Trembly J.P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 2003.
4.	Nar.singh Deo, "Graph theory with application to Engg and computer science", PHI Learning, New Delhi, 2012.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY–AUTONOMOUS

40 HS 002 - ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING

Common to all Branches

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	2	0	0	45	2	50	50	100

Objective(s)

- The main objective of this course is to make the Engineering student to know about the basic of economics, how to organize a business, financial aspects related to business, different methods of appraisal of projects and pricing techniques.

Course Outcomes

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

1. Apply suitable demand forecasting techniques.
2. Appraise the prevailing market structure.
3. Describe forms of business in an organization.
4. Distinguish between proprietorship and partnership.
5. Explain the various kinds of banking.
6. Illustrate the balance sheet with a suitable example.
7. Differentiate between fixed cost and variable cost.
8. Interpret technical feasibility and economic feasibility.
9. Apply break even analysis in engineering projects.
10. Summarize the managerial uses of break even analysis.

BASIC ECONOMICS

Definition of economics – nature and scope of economics – basic concepts of economics – factors of production – demand analysis – definition of demand – Law of demand – Exception to law of demand – Factors affecting demand – elasticity of demand – demand forecasting – definition of supply – factors affecting supply – elasticity of supply – market structure – perfect competition – imperfect competition - monopoly – duopoly – oligopoly and bilateral monopoly .

ORGANIZATION AND BUSINESS FINANCING

Forms of business – proprietorship – partnership - joint stock company - cooperative organization - state Enterprise - mixed economy - Money and banking – kinds of banking - commercial banks - central banking functions - control of credit - monetary policy - credit instrument – Types of financing - Short term borrowing - Long term borrowing - Internal generation of funds - External commercial borrowings - Assistance from government budgeting support and international finance corporations.

FINANCIAL ACCOUNTING AND CAPITAL BUDGETING

The balance Sheet and related concepts – The profit and loss statement and related concepts – Financial ratio analysis – Cash flow analysis – fund flow analysis – Capital budgeting– Average rate of return – Payback period – Net present value and internal rate of return.

COST ANALYSIS

Types of costing – traditional costing approach - activity based costing - Fixed Cost – variable cost – marginal cost – cost output relationship in the short run and in long run – pricing practice – full cost pricing – marginal cost pricing – going rate pricing – bid pricing – pricing for a rate of return – appraising project profitability - cost benefit analysis – feasibility reports – appraisal process – technical feasibility - economic feasibility – financial feasibility.

BREAK EVEN ANALYSIS

Basic assumptions –break even chart – managerial uses of break even analysis - applications of break even analysis in engineering projects.

Textbook(s):

1. Khan MY and Jain PK, “Financial Management”, McGraw - Hill Publishing Co., Ltd., New York, 2000.
2. Varshney RL and Maheshwary KL, “Managerial Economics” S Chand and Co., New Delhi, 2001.

Reference(s):

1. Barthwal R.R, “Industrial Economics - An Introductory”, New Age Publications, New Delhi, 2001.
2. Samuelson P.A, “Economics - An Introductory Analysis”, McGraw - Hill & Co., New York, 2000.
3. S.K.Bhattacharyya, John Deardon and Y.M.Koppikar, “Accounting for Management Text and Cases”, Vikas Publishing House Pvt Ltd., New Delhi – 110002, 1984.
4. V.L.Mote, Samuel and G.S.Gupta, “Managerial Economics – Concepts and Cases”, Tata Mcgraw Hill Publishing Company Ltd., New Delhi – 110002, 1981.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 701 - SERVICE ORIENTED ARCHITECTURE								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100
Objective(s)	• To understand the concepts of Service Oriented Architecture along with the evolution of SOA • To analyze SOA concepts with Web Services paradigms • To understand SOA service analysis and design							
Course Outcomes	**At the end of the course, the students will be able to** 1. Demonstrate XML basics and illustrate SOA evolution 2. Illustrate SOA fundamentals and characteristics 3. Analyze web service framework and messaging with SOAP and WSDL. 4. Apply MEP, Orchestration and Choreography to standardize organization 5. Understand messaging, policies and security 6. Analyze the service orientation and principles of service orientation 7. Analyze service layers 8. Demonstrate SOA Delivery Strategies and Service Modeling 9. Comprehend SOAP language basic and SOA standards 10. Analyze the service design of SOA and SOA platforms							

XML AND SOA

XML Elements –XML attributes –XML Namespace – XML DTD –XML Schema –CSS–SOA Fundamentals. Evolution of SOA–An SOA timeline–The roots of SOA, Fundamentals SOA–Common characteristics of contemporary SOA

WEB SERVICES

Web Services framework–Services–WSDL-related XML Schema language basics –Services descriptions with WSDL –Messaging with SOAP–-Message exchange patterns –Orchestration– Choreography

WEB SERVICES AND SOA SERVICES ORCHESTRATION

Reliable messaging–Policies–Security- Principles of Service Orientation–Service Orientation and the enterprise–Common Principles of Service Orientation

SERVICE LAYERS AND SOA ANALYSIS

Service Orientation and Contemporary SOA–Service Layers abstraction–Application Service Layers–Business Service Layers–Orchestration Service Layers–Agnostic Service–SOA Delivery Strategies-life cycle phases-Service modeling–Service modeling guidelines

SOA DESIGN AND PLATFORM

Introduction to Service Oriented design-SOAP Language basics–Steps to composing SOA–Consideration for positioning core SOA standards–Service design Overview–Application Service design–Task centric business design-Service design guidelines–SOA platform basics–SOA support in J2EE.

Text book(s):

1.	Thomas Erl, “Service Oriented Architecture: Concepts, Technology, and Design”, 2nd impression, Pearson Education, 2012.
2.	Frank P.Coyle, “XML, Web Services and the Data Revolution”, Pearson Education, 2002.

Reference(s):

1.	Thomas Erl, “SOA Principles of Service Design “(The Prentice Hall Service-Oriented Computing Series from Thomas Erl), 2007.
2.	Newcomer, Lomow, “Understanding SOA with Web Services”, 1st edition , Pearson Education, 2005.
3.	Dan Woods and Thomas Mattern, “Enterprise SOA Designing IT for Business Innovation”, O’REILLY, 1st Edition, 2006.
4.	Ron Schmelzer et al., “XML and Web Services”, 1st edition, Pearson Education, 2002.
5.	James McGovern,Sameer Tyagi, Michael E.Stevens, Sunil Mathew, ”Java Web Services Architecture”, 1st edition, Morgan Kaufmann Publishers, 2003.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT 702 - COMPONENT BASED TECHNOLOGY

IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)

- To understand the fundamentals of component and its architecture
- To identify different approaches in java to create and implement component
- To know CORBA architecture for component with its techniques
- To analyze different COM and DCOM techniques with .NET components
- To design a framework for component tools

Course Outcomes

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

1. Realize the basic concepts of software components, objects, and other component methodologies
2. Acquire knowledge about callbacks, component architecture and middleware technologies
3. Analyze threads, Java Beans with its events and properties and archive files
4. Obtain knowledge of object serialization, EJB, DOM, RMI and RMI - IIOP
5. Identity the need of CORBA, IDL, ORB and SOM
6. Acquire knowledge about POA, CORBA services, CCM, containers, application server and MDA
7. Comprehend the concept of COM, DCOM, Object reuse, versioning and dispatch interfaces
8. Obtain knowledge of connectable object, OLE containers and servers, ActiveX controls and .NET components
9. Customize the aspect of connectors, EJB containers, CLR contexts and channels, Black Box component framework and directory objects
10. Examine the concept of cross-development environment, COP, Component design and implementation tools, testing and assembly tools

INTRODUCTION

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

JAVA BASED COMPONENT TECHNOLOGIES

Threads – Java Beans – Events and connections – properties – introspection – JAR files – reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP - ORM.

CORBA COMPONENT TECHNOLOGIES

Java and CORBA – Interface Definition language – Object Request Broker – System Object Model – Portable Object Adapter – CORBA services – CORBA component model – containers – Model Driven Architecture.

. NET BASED COMPONENT TECHNOLOGIES

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.

COMPONENT FRAMEWORKS AND DEVELOPMENT

Connectors – EJB containers – CLR contexts and channels - JAXB – Black Box component framework – cross-development environment – component-oriented programming – Component design and implementation tools – testing tools - assembly tools – Open source framework.

Text book(s):

1	Clemens Szyperski, “Component Software: Beyond Object-Oriented Programming”, 2nd Edition, Pearson Education publishers, 2003.

Reference(s):

1	G.Sudha Sadasivam, “Component - Based Technology”, Wiley India Pvt. Ltd, 2008.
2	Ramesh and Raja Sekaran, “Component Based Technology”, Sams Publishers, Chennai, 2007.
3	Mowbray, “Inside CORBA”, Pearson Education, 2003.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 703 - COMPUTER GRAPHICS AND MULTIMEDIA								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100
Objective(s)	• To know various output primitives • To understand 2D and 3D geometric objects • To study basics of multimedia and various files supporting multimedia							
Course Outcomes	**At the end of the course, the students will be able to** 11. Comprehend the basics of line ,circle and ellipse generating algorithms 12. Apprehend different attributes and color levels 13. Understand the 2D transformations and viewing the objects 14. Comprehend various 3D object representations 15. Understand the 3D geometric modeling and viewing the objects 16. Explicate the various color models 17. Acquire the knowledge about the Multimedia Architecture and Compression techniques 18. Categorize different File Format Standards along with digital audio and video 19. Comprehend the different Hypermedia and Mobile Messaging 20. Determine the Distributed concepts of the Multimedia Technology							

OUTPUT PRIMITIVES

Overview of Graphics System – Points and Lines - Line Drawing Algorithms – DDA , Bresenham - Circle and Ellipse Generating Algorithms – Line Attributes – Curve Attributes – Color and Grayscale Levels – Area fill attributes – Character attributes

TWO-DIMENSIONAL TRANSFORMATIONS AND VIEWING

Two-Dimensional Geometric Transformations – Two-Dimensional Viewing - Three-Dimensional Object Representations – Polygon surfaces, Spline surfaces, Bezier curves - Octrees

THREE-DIMENSIONAL CONCEPTS

Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing - Color models

MULTIMEDIA SYSTEMS DESIGN AND FILE HANDLING

Introduction –Multimedia System Architecture – Evolving technologies for Multimedia–Binary Image Compression Schemes – Color, Grayscale and Still-Video Image Compression – Data and File Format Standards –TIFF, RIFF, MIDI, TWAIN File Formats– Digital Voice and Audio – Video Image and Animation – Full Motion Video

MULTIMEDIA AUTHORING AND HYPERMEDIA MESSAGING

Multimedia Authoring Systems – Hypermedia Application Design Considerations – User Interface Design– Object Display/Playback Issues – Hypermedia Messaging – Mobile Messaging – Hypermedia Message Components – Hypermedia Linking and Embedding – Creating Hypermedia Messages – Components of Distributed Multimedia Systems - Video Conferencing through TANDBERG.

Text book(s):

1	Donald Hearn and Pauline Baker M, “Computer Graphics C Version”, 3rd Edition, Pearson Education, 2011.
2	Prabhat K.Andleigh and Kiran Thakrar, “Multimedia Systems and Design”, PHI, 2009.

Reference(s):

1	Judith Jeffcoate, “Multimedia in practice technology and Applications”, PHI,1998.
2	Foley, Vandam, Feiner, Huges, “Computer Graphics: Principles & Practice”, Pearson Education, 2nd edition, 2003.

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 7P1 – SOFTWARE COMPONENTS LABORATORY								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	0	0	3	45	2	50	50	100

Objective(s)	• To develop an ability to design and implement different COM/DCOM application in VB • To design and create client server application in java and CORBA • To create a component in NetBeans for different application • To develop a project using different technologies in .NET
Course Outcomes	**At the end of the course, the students will be able to** 1. Create a component in COM/DCOM using ActiveX control 2. Implement ActiveX DLL concept to develop a component 3. Design a application using ActiveX exe 4. Develop a multimedia application for component technology 5. Deploy a RMI interface for client server application in java 6. Create a remote application in RMI 7. Implement and develop an application using CORBA IDL concept 8. Develop a simple bean component using NetBeans 9. Implement different concepts of NetBeans for real time application 10. Develop a project in .NET

LIST OF EXPERIMENTS

1. Develop simple COM components in VB and use them in applications. [ActiveX Control].
2. Create a COM/DCOM component in VB and use them in applications. [ActiveX DLL].
3. Design a simple COM/DCOM real time component and use them in applications [ActiveX EXE]
4. Develop and deploy a component for multimedia file.
5. Create and deploy RMI for simple client server applications.
6. Design and develop a file transfer application using RMI.
7. Implement a simple application using CORBA
8. Design and develop an application for simple drawing/calculation using NetBeans
9. Design and develop a component for real time system in NetBeans.
10. Develop a project in .NET for a real time application

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT 7P2 – COMPUTER GRAPHICS AND MULTIMEDIA LABORATORY

IT

Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P	45	C	CA	ES	Total
VII	0	0	3		2	50	50	100

Objective(s)	• To implement various algorithms of line, circle and ellipse drawing • To experiment 2D and 3D Transformations • To design certificate and prepare of Brochure material
Course Outcomes	**At the end of the course, the students will be able to** 1. Generate lines using DDA and Bresenham's line drawing algorithms 2. Apply the skill to generate circles and ellipses 3. Acquire the proficiency to perform 2D translation, rotation, and scaling 4. Understand the knowledge about the Cohen-Sutherland Clipping 5. Acquire the proficiency to perform 3D translation, rotation, and scaling 6. Understand knowledge about conversion between colour models 7. Attain the expertise in text compression 8. Acquire the knowledge about the basic principles of Animation 9. Design a simple certificate 10. Understand the handiness in preparation of Brochure

LIST OF EXPERIMENTS

1. Line Drawing Algorithm - DDA and Bresenham's
2. Mid-point Circle and Ellipse generation algorithms
3. 2D Transformations such as translation, rotation, scaling, reflection and sharing
4. 2D clipping by Cohen-Sutherland algorithm
5. 3D Transformations such as translation, rotation and scaling
6. Conversions between various Color models
7. Text compression
8. Simple animation with transformation and clipping
9. Designing a simple certificate
10. Preparation of Brochure

SUGGESTED SOFTWARE TOOLS: Photoshop (Version – CC), Flash Player 11.1, CorelDraw X8

<table>
<tr><th colspan="8">K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS</th></tr>
<tr><th colspan="8">40 IT 7P3 – PROJECT WORK – PHASE I</th></tr>
<tr><th colspan="8">IT</th></tr>
<tr><td rowspan="2">Semester</td><td colspan="3">Hours / Week</td><td rowspan="2">Total hrs</td><td>Credit</td><td colspan="3">Maximum Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>VII</td><td>0</td><td>0</td><td>3</td><td>45</td><td>2</td><td>100</td><td>0</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="7">To impart practical knowledge to the students and also to make them to carry out the technical procedures in their project work.
To provide an exposure to the students to refer, read and review the research articles, journals and conference proceedings relevant to their project work and placing this as their beginning stage for their final presentation</td></tr>
<tr><td>Course Outcomes</td><td colspan="7">At the end of the course, the students will be able to
1. Identify engineering problems relevant to the domain and carry out literature survey for its support
2. Analyse and identify an appropriate technique to solve the problem
3. Do experimentation / simulation / programming / fabrication, collect and interpret data
4. Document, prepare technical report and do power point presentation
5. Demonstrate their responsibility as an individual and a leader in group presentation.</td></tr>
<tr><td>Methodology</td><td colspan="7">A committee is constituted with the project coordinator, project guide and HOD/Senior professor in the department
Three reviews have to be conducted by the committee
Problem should be selected by every batch of students
Students must do a literature survey collecting a minimum of 10 papers related to their work
Report has to be prepared by the students as per the format
Preliminary implementation can be done if possible
Internal evaluation has to be done based on the three reviews for 100 marks</td></tr>
</table>

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								R 2014
Department	Information Technology	Programme Code & Name			IT: B.Tech. Information Technology			
Semester VII								
Course Code	Course Name	Hours/Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
40 TP 0P5	Career Competency Development V	0	0	2	0	100	00	100
Objective(s)	To enhance employability skills and to develop career competency							

		Hrs
Unit – 1	Written and Oral Communication	
Self Introduction – GD – HR Interview Skills – Corporate Profile Review Practices on Company Based Questions and Competitive Exams Materials: Instructor Manual		6
Unit – 2	Verbal & Logical Reasoning	6
Practices on Company Based Questions and Competitive Exams Materials: Instructor Manual		
Unit – 3	Quantitative Aptitude	6
Practices on Company Based Questions and Competitive Exams Materials: Instructor Manual		
Unit – 4	Data Interpretation and Analysis	6
Practices on Company Based Questions and Competitive Exams Materials: Instructor Manual		
Unit – 5	Programming & Technical Skills – Part 3	6
Data Structure - Arrays – Linked List – Stack – Queues – Tree – Graph Practices on Algorithms and Objective Type Questions Materials: Instructor Manual		
	Total	30

Evaluation Criteria

S.No.	Particular	Test Portion	Marks
1	Evaluation 1 Written Test	15 Questions each from Unit 1, 2,3, 4 & 5 (External Evaluation)	60
2	Evaluation 2 - Oral Communication	GD and HR Interview (External Evaluation by English, MBA Dept.)	20
3	Evaluation 3 – Technical Interview	Internal Evaluation by the Dept. – 3 Core Subjects	20
		Total	100

Reference Books

1. Aggarwal, R.S. “A Modern Approach to Verbal and Non-verbal Reasoning”, Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.
2. Abhijit Guha, “Quantitative Aptitude”, TMH, 3rd edition
3. Objective Instant Arithmetic by M.B. Lal & GoswamiUpkar Publications.
4. Word Power Made Easy by Norman Lewis W.R. GOYAL PUBlications

Note:

- Instructor can cover the syllabus by Class room activities and Assignments(5 Assignments/week)
- Instructor Manual has Class work questions, Assignment questions and Rough work pages
- Each Assignment has 20 questions for Unit 1,2,3,4 & 5 and Unit 5 and 5 questions from Unit 5(Algorithms) & Unit 1(Oral Communication)
- Evaluation has to be conducted as like Lab Examination.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 HS 001 – PROFESSIONAL ETHICS								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	2	0	0	45	2	50	50	100
Objective(s)	• To create an awareness on Ethics and Human Values and instill Moral and Social Values in students							
Course Outcomes	**At the end of the course, the student will be able to** 1. Know the concept of ethics and engineering as a profession 2. Learn the core qualities of professional practitioners 3. Realize engineering as experimentation 4. Study the role of codes and industrial standards as per law 5. Understand the need of safety in testing and designing 6. Know about risk benefit analysis and reducing risk 7. Understand the importance of collegiality, conflict of interest, and professional rights 8. Know the employee rights and IPR 9. Understand the ethics in MNC's, Computers and Social Medias 10. Know the values of engineers as managers and engineers responsibilities in weapons development							

INTRODUCTION

Morals, values and ethics – Integrity – Respect for others, Honesty – Commitment – Character– Core qualities of professional practitioners –Theories of right action – Types of inquiry – Kohlberg's stages of moral development – Carol Gilligan theory – Moral dilemmas – Moral autonomy.

ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as Experimentation – Engineers as Responsible Experiments – Codes of Ethics – A Balanced Outlook on Law – The Challenger Case Study and Volks Wagon's Case Study.

ENGINEERS RESPONSIBILITY FOR SAFETY AND RISK

Safety and Risk – Assessment of Safety and Risk – Risk Benefit analysis and reducing Risk – The Three Mile Island Disaster Case Study and Chennai Moulivakkam Building Accident case study.

RESPONSIBILITIES AND RIGHTS

Collegiality and Loyalty – Respect for Authority – Conflict of Interest – Collective Bargaining – Confidentiality - Occupational Crime – Professional Rights – Employee Rights – Customers Rights - Intellectual Property Rights (IPR) – Discrimination – Nestle Maggi Case Study.

GLOBAL ISSUES

Multinational corporations(MNC) – Environmental Ethics – Computer ethics – Social Media Ethics – Engineers as Managers, Expert Witnesses and Advisors – Moral leadership - Weapons development – The Bhopal Gas Tragedy Case Study.

Text book(s):

1	Govindarajan M, Natarajan S, Senthil Kumar V.S, "Engineering Ethics", Prentice Hall of India (P) Ltd, New Delhi, 10th Reprint, 2009.

Reference(s):

1	Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw -Hill Publishing Company Limited, New Delhi, 2007.
2	Govindan K.R., and Sendhil Kumar S., "Professional Ethics and Human Values", Anuradha Publications, Chennai, 2011.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E21 - WIRELESS SENSOR NETWORKS								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)	• Know the basics of Wireless Sensor Networks • Understand the architecture of WSN • Analyze MAC layer protocols • Assess and classify the requirements of Network and Transport Layer protocols • Predict reliable packet delivery in WSN
Course Outcomes	**At the end of the course, the students will be able to** 1. Analyze ad-hoc and Wireless Sensor Networks 2. Identify the application and technologies for Wireless Sensor Networks 3. Predict the scenarios of Wireless Sensor Networks 4. Examine the architecture of Wireless Sensor Networks 5. Identify the requirements of MAC protocols 6. Analyze the MAC protocols in WSN 7. Assess the issues with routing in WSN 8. Analyze the routing protocols in WSN 9. Identify the functions of transport layer 10. Analyze QoS in WSN

INTRODUCTION

Wireless Sensor Networks - Challenges - Characteristics Requirements - Comparison of Mobile Ad-Hoc Networks **and** Sensor Networks - Applications of Sensor Networks - Enabling Technologies for Wireless Sensor Networks.

ARCHITECTURE

Single- Node Architecture - Hardware Components - Energy consumption of Sensor Nodes - Operating Systems - Execution Environments - Sensor Network Scenarios - Optimization Goals and Figures of Merit - Design Principles of Wireless Sensor Networks - Gateway Concepts.

MAC LAYER

MAC addressing - Requirements and Design Constraints for Wireless MAC Protocols - MAC Protocols for Wireless Sensor Networks - STEM - S-MAC – PAMAS – LEACH - IEEE 802.15.4 MAC protocol.

NETWORK LAYER

Properties of localization and positioning procedures - Routing Protocols: Issues in designing Routing Protocols, Energy-efficient unicast - Multipath Unicast Routing - Broadcast and Multicast Source Based Tree Protocols - Geographic Routing - Geocasting.

TRANSPORT LAYER

Coverage and Deployment - Reliable Data Transport - Single Packet Delivery - Block Delivery - Congestion Control and Rate Control.

Text book(s):

1	Holger Karl and Andreas Willig,"Protocols and Architectures for Wireless Sensor Networks",Wiley,2013.
2	Ian F. Akyildiz , Mehmet Can Vuran ," Wireless Sensor Networks", Wiley, 1st Edition ,2011.

Reference(s):

1	C.Siva Ram Murthy and B.S.Manoj, "Ad Hoc Wireless Networks – Architectures and Protocols", Pearson education, 2006.
2	Feng Zhao & Leonidas J.Guibas, "Wireless Sensor Networks – An Information Processing Approach", Elsevier, 2007.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E22 - DIGITAL IMAGE PROCESSING								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)	• To understand the image fundamentals and steps in image processing • To learn the image enhancement techniques • To study the image compression techniques and image segmentation procedures • To understand the fundamentals of image representation and description
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the fundamentals of digital image 2. Analyze the principles of color image processing 3. Perform the image enhancement in spatial domain 4. Perform the image enhancement in frequency domain 5. Know the image compression models 6. Discuss the different methods for lossy and lossless compression 7. Describe the basics of segmentation 8. Discuss the different approaches for image segmentation 9. Analyze the methods for image representation 10. Explain the usage of regional and relational descriptors

DIGITAL IMAGE FUNDAMENTALS

Origins of digital image processing – Fields that use digital image processing – Fundamental steps in digital image processing - Elements of visual perception – Image sampling and quantization – Basic relationship between pixels – Color image processing - Color Models- Pseudocolor image processing – Basics of full color image processing

IMAGE ENHANCEMENT

Spatial Domain methods: Basic grey level transformation – Histogram equalization – Enhancement using arithmetic/logic operations – Spatial filtering: smoothing, sharpening filters – Frequency domain methods: Frequency domain filters: smoothing, sharpening – Homomorphic filtering.

IMAGE COMPRESSION

Fundamentals – Image compression models – Error free compression: Variable length coding, LZW coding, Bit plane coding – Lossy compression: Lossy predictive coding, Transform coding, Wavelet coding – Image compression standards

IMAGE SEGMENTATION

Detection of discontinuities – Edge linking and boundary detection – Thresholding – Region based segmentation – Segmentation by morphological watersheds

IMAGE REPRESENTATION AND DESCRIPTION

Representation – Boundary descriptors: Shape numbers, Fourier descriptors, Statistical moments – Regional descriptors: Topological descriptors, Texture – Relational descriptors

Text book(s):

1	Rafael C Gonzalez, Richard E. Woods, “Digital Image Processing”, Pearson Education, 3rd Edition, 2015.
2	Jayaraman S., Veerakumar T., Esakkirajan S.,“Digital Image Processing”, Tata Mc Graw Hill education, New Delhi, 2009.

Reference(s):

1	William K Pratt,” Digital Image Processing”, CRC press, 2013.
2	Wilhelm Burger, Mark J.Burge, “Principles of Digital Image Processing”, Springer International edition, 2012.
3	Annadurai S. and Shanmugalakshmi R., “Fundamentals of Digital Image Processing”, Pearson Education, 2007.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E23 - SOFTWARE PROJECT MANAGEMENT								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100
Objective(s)	• To understand the fundamentals of software project management and its planning • To identify different project evaluation techniques and cost benefit analysis • To analyze the activity planning methods and risk management approach • To provide a comprehensive view of monitoring and controlling framework • To analyze different ways to manage team work of people and organizational structure							
Course Outcomes	**At the end of the course, the students will be able to** 1.Familiar with the concept of contract management and activities of software project management 2. Realize the basic concepts of project planning and stepwise project planning 3. Analyze the strategic and technical assessment with cost benefit analysis 4. Acquire knowledge about Cost benefit and risk evaluation techniques 5. Customize the activity planning aspects with scheduling and network planning models 6. Obtain knowledge of Risk management with its types, identification, planning with the evaluating process 7. Identity the method of collecting data, cost monitoring and analysis along with the change control 8. Classify the type of contract and terms with the contract management techniques 9. Outline the understanding and organizational behaviors and models 10. Examine the concept of groups and teams with stress and safety approach							

INTRODUCTION

Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

PROJECT EVALUATION

Strategic Assessment – Technical Assessment – Cost Benefit Analysis –Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

ACTIVITY PLANNING AND RISK MANAGEMENT

Objectives – Project Schedule – Sequencing and Scheduling Activities –Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Categories of risk – Risk identification and assessment – Risk planning – Risk management and Evaluating risks to the schedule.

MONITORING AND CONTROL

Creating Framework – Collecting the Data – Visualizing Progress – Cost Monitoring – Earned Value analysis– Prioritizing Monitoring – Getting project back to target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of a Contract – Contract Management – Acceptance.

MANAGING PEOPLE AND ORGANIZING

Introduction – Understanding Behaviour – Organizational Behaviour: A Background – Selecting the right person for the job – Instruction in the best methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working in Groups – Becoming a Team –Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies.

Text book(s):

1	Bob Hughes, Mikecotterell, “Software Project Management”, 4th Reprint Edition, Tata McGraw Hill, 2004.

Reference(s):

1	Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2	Royce, “Software Project Management”, Pearson Education, 1999.
3	Jalote, “Software Project Management in Practice”, Pearson Education, 2002.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT E24 - CYBER SECURITY AND FORENSICS

IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)

- To know about security standards and how to secure the system
- To explore various security policies and employee responsibilities
- To understand the significance of information security

Course Outcomes

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

1. Outline the basics of cybercrime
2. Analyze the plan of criminals
3. Explore the concept of mobile and wireless devices
4. Describe the security implications for organization
5. Explain the attacks and its impact in security
6. Identify the methods used in cybercrime
7. Classify the Indian IT act in cyber security
8. Examine the methods and techniques used in computer forensics
9. Realize the hand- held devices with their toolkit related to forensics
10. Identify the organizational implications with respect to cost and issues in cybercrime

INTRODUCTION

Cybercrime and information security – classification of cybercrimes – cybercrime and the India ITA2000 – A global perspective on cybercrimes - cyber stalking – cyber café and cybercrimes – botnets – attack vector.

CYBERCRIME: MOBILE AND WIRELESS DEVICES

Trend mobility - authentication service security - Attacks on mobile phones - mobile phone security Implications for organizations - Organizational measurement for Handling mobile - Security policies and measures in mobile computing era.

TOOLS AND METHODS USED IN CYBERCRIME

Proxy servers and Anonymizers – Phishing - Password cracking - Key loggers and Spy wares - Virus and worms - Trojan horse and Backdoors – Steganography – DOS and DDOS Attacks - SQL Injection - Buffer overflow - Attacks on wireless network.

THE LEGAL PERSPECTIVES AND COMPUTER FORENSICS

Indian IT Act - Understanding computer forensic -Historical background of cyber forensic - Forensic analysis of e-mail - Digital forensic life cycle - Network forensic- Setting up a computer forensic Laboratory - Relevance of the OSI 7 Layer model to computer Forensic - Computer forensic from compliance perspectives.

FORENSIC OF HAND HELD DEVICES AND ORGANIZATIONAL IMPLICATIONS

Understanding cell phone working characteristics - Hand - Held devices and digital forensic - Toolkits for Hand - Held device - Forensic of I- pod and digital music devices – Techno legal Challenges with evidence from hand-held Devices - Cost of cybercrimes and IPR issues – incident handling: an essential component of cyber security.

Text book(s):

1	Nina Godbole, SunitBelapure “Cyber security understanding cyber crimes, computer forensics and legal perspectives”, Wiley publication, 2014.

Reference(s):

1	Harish Chander, “cyber laws & IT protection”, PHI learning pvt.ltd, 2012.
2	MS.M.K.Geetha&Ms.SwapneRaman, ”Cyber Crimes and Fraud Management”, MACMILLAN, 2012.
3	Pankaj Agarwal, “Information Security & Cyber Laws (Acme Learning)”, Excel, 2013.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E25 - BUSINESS INTELLIGENCE								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)	• To identify technology and processes associated with Business Intelligence framework • To implement data warehouse implementation methodology, project life cycle and multidimensional data modeling • identify the business scenario, metrics, indicators and make recommendations to achieve the business goal • To design an enterprise dashboard using open source/MS Office
Course Outcomes	**At the end of the course, the students will be able to** 1. List the definitions, concepts, and architectures of data warehousing 2. Identify the major frameworks of computerized decision support: Decision Support Systems (DSS), data analytics and business intelligence (BI) 3. Analyze the impact of data integration 4. Describe how tools are powering data integration 5. Analyze the impact of business reporting, information visualization, and dashboards 6. Outline the definitions, concepts and techniques of multi-dimensional data modeling. 7. Design an enterprise dashboard for decision making 8. Design an enterprise dashboard using open source/MS Office 9. Apply big data technologies in business intelligence using geospatial data, location-based analytics, social networking, Web 2.0, reality mining, and cloud computing 10. Describe how analytics are powering consumer applications and creating a new opportunity for entrepreneurship for analytics

INTRODUCTION

Introduction to Digital Data - Introduction - Types of Data - Introduction to OLTP and OLAP - OLTP vs OLAP - Different OLAP Architectures - Data Models for OLTP and OLAP - OLAP Operations on Multidimensional Data - BI Definitions and Concepts - BI Component Framework - Data Warehousing Concepts and its Role in BI - BI Infrastructure Components - Impact of BI - BI Users - BI Roles and Responsibilities - Business Intelligence Applications - Best Practices BI/DW.

DATA INTEGRATION

Introduction to Data Warehouse - Data Integration - Data Integration Technologies - Data Quality - Data Profiling - Kettle Software: Introduction to ETL using Pentaho Data Integration.

MULTI-DIMENSIONAL DATA MODELING

Introduction - Data Modeling Basics – Types – Techniques - Fact and Dimension Tables - Dimensional Models - Introduction to Measures and Metrics - Introduction to Business Metrics and KPIs - KPI Usage in Companies - Creating Cubes using Microsoft Excel.

ENTERPRISE REPORTING

Reporting Perspectives - Enterprise Reporting Characteristics - Malcolm Baldrige Framework -, Balanced Scorecard - Enterprise Dashboard - Balanced Scorecard vs. Enterprise Dashboard - Enterprise Reporting using MS Access / MS Excel.

BI APPLICATIONS AND CASE STUDIES

Understanding BI and Mobility - BI and Cloud Computing - BI for ERP System - Social CRM and BI - Case Study: Good Lift HealthCare group - TentoTen Retail Stores.

Text book(s):

1	RN Prasad and Seema Acharya, “Fundamental of Business Analytics”, Wiley India, 2011.

Reference(s):

1.	John Boyer, Bill Frank, Brian Green, Tracy Harris, and Kay Van De Vanter, “Business Intelligence Strategy: A Practical Guide for Achieving BI Excellence”, IBM Corporation, 2010.
2.	Swain Scheps, “Business Intelligence for Dummies”, Wiley Publishing Inc, 2008.
3.	Cindi Howson, “Successful Business Intelligence:Secrets to making BI a killer App”, McGraw Hill,2008.
4.	Elizabeth Vitt, Michael Luckevich, Stacia Misner, “Business Intelligence: Making Better Decisions Faster”, Microsoft Press, 2002.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E31 - C# AND .NET								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100
Objective(s)	• To gain knowledge in the concepts of the .NET framework and the technologies that constitutes the framework • To know the programming skills in C# both in basic and advanced levels • To build sample applications and get experience and be ready for large–scale projects							
Course Outcomes	**At the end of the course, the students will be able to** 1.Understand the overview of C# and the concept of .NET 2.Acquire knowledge about the various concepts to write C# programs using arrays, strings, structures and enumerations 3.Develop C# programs which makes use of classes , objects, inheritance and polymorphism 4.Create console applications using interfaces and operator overloading and distinguish the concepts of delegates, events, errors and exceptions 5.Design windows application and build up the XML documentation comments 6.Manipulate the application to access data with ADO.NET and gain knowledge about OLE DB MP 7.Apply the knowledge of data binding to create Web forms 8.Acquire knowledge of Web services and build a Web service and identify how to create the proxy 9.Gain knowledge of assemblies and versioning. concepts in .NET 10.Explore the activities of attributes, reflection, marshalling and remoting							

INTRODUCTION TO C#

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

OBJECT ORIENTED ASPECTS OF C#

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

WINDOW BASED APPLICATION DEVELOPMENT ON .NET

Building Windows Applications - Creating a Simple Windows Forms, Creating a Windows Forms Application, XML Documentation Comments. Accessing Data with ADO.NET - Relational Databases and SQL, ADO .NET Object Model, Using OLE DB Managed Providers and Working with Data-Bound Controls.

WEB BASED APPLICATION DEVELOPMENT ON .NET

Understanding Web Forms - Creating a Web Forms - Adding Controls - Data Binding - Web Services - SOAP, WSDL and Discovery - Building a Web Service - Creating the Proxy - Session and Cache management.

THE CLR AND THE .NET FRAMEWORK

Assemblies and Versioning - PE Files, Metadata, Security Boundary, Manifests and Assemblies - Attributes and Reflection - Marshaling and Remoting,

Text book(s):

1	E. Balagurusamy, “Programming in C#”, 3rd Edition, Tata McGraw-Hill, 2012.
2	Jesse Liberty, “Programming C#”, 4th Edition, O’Reilly, 2007.

Reference(s):

1	Herbert Schildt, “The Complete Reference: C# 2.0”, 2nd Edition, Tata McGraw-Hill, 2005.
2	Robinson et al, “Professional C#”, 3rd Edition, Wrox Press, 2004.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E32 - BIOINFORMATICS								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)	• Exposed to the need for Bioinformatics technologies • Be familiar with the modeling techniques • Learn microarray analysis • Exposed to Pattern Matching and Visualization
Course Outcomes	**At the end of the course, the students will be able to** 1. Realize the scope and various components of Bioinformatics technologies 2. Identify the data processing, applications and roles of structural bioinformatics 3. Discover the data warehousing and data mining ideas bioinformatics 4. Identify the role of machine learning and neural networks in bioinformatics 5. Grow expertise in modeling for bioinformatics 6. Identify the concepts Bayesian and Boolean networks and computer programs for molecular modeling 7. Discover the basic strategies in pattern matching 8. Categorize the dimensional and sequence representation in visualization 9. Apply techniques of microarray in bioinformatics 10. Discover the techniques and models in data management and analysis

INTRODUCTION

Need for Bioinformatics technologies – Overview of Bioinformatics technologies Structural bioinformatics – Data format and processing – Secondary resources and applications – Role of Structural bioinformatics - Biological Data Integration System.

DATA WAREHOUSING AND DATA MINING

Bioinformatics data – Data warehousing architecture – data quality – Biomedical data analysis – DNA data analysis – Protein data analysis – Machine learning – Neural network architecture and applications in bioinformatics.

MODELING

Hidden markov modeling for biological data analysis – Sequence identification –Sequence classification – multiple alignment generation – Comparative modeling –Protein modeling – Bayesian networks – Computer programs for molecular modeling.

PATTERN MATCHING AND VISUALIZATION

Gene regulation – motif recognition – motif detection – strategies for motif detection – Visualization – Fractal analysis – DNA walk models – one dimension – two dimension – higher dimension – Game representation of Biological sequences – DNA, Protein, Amino acid sequences.

MICROARRAY ANALYSIS

Microarray technology for genome expression study – image analysis for data extraction – preprocessing – segmentation – gridding – spot extraction – normalization, filtering – cluster analysis – gene network analysis – Compared Evaluation of Scientific Data Management Systems – Cost Matrix – Evaluation model - Benchmark – Tradeoffs.

Text book(s):

1	Yi-ping Phoebe Chen (Ed),"Bioinformatics Technologies", 2nd Indian Reprint, 2014.

Reference(s):

1	Bryan Bergeron ,"Bioinformatics computing", 2nd Edition , Pearson Education, 2015.
2	Arthur M Lesk, "Information to bioinformatics", 4th Edition, Oxford University Press, 2013.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E33 - INFORMATION RETRIEVAL TECHNIQUES								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100
Objective(s)	• To study the Basic retrieval techniques of information • To study dynamic approaches for retrieval; to study the clustering and pattern matching methods • To study web search techniques catering retrieval process							
Course Outcomes	**At the end of the course, the students will be able to** 1. Understand the fundamentals of Retrieval Process and Modeling 2. Know about the components for Algebraic and Probabilistic Models 3. Apply transformation technique such as Local and Global Analysis 4. Know about the User Interface and Visualization 5. Understand the Two Dimensional Color Images and Feature Extraction 6. Establish the queries and sequential search methods 7. Understand data models and query languages 8. Establish generic multimedia indexing approach 9. Establish the online IR systems and libraries 10. Know document models, and web access							

INTRODUCTION

Basic Concepts – Retrieval Process – Modeling – Classic Information Retrieval- Algebraic and Probabilistic Models – Retrieval Performance Evaluation

QUERY LANGUAGES AND OPERATIONS

Languages – Key Word based Querying – Pattern Matching – Structural Queries – Query Operations – User Relevance Feedback – Local and Global Analysis – Text and Multimedia languages.

TEXT OPERATIONS,INDEXING AND SEARCHING

Document Preprocessing – Clustering – Text Compression - Indexing and Searching – Inverted files – Boolean Queries – Sequential searching – Pattern matching – User Interface and Visualization – Human Computer Interaction

MULTIMEDIA MODELS, INDEXING AND SEARCHING

Data Models – Query Languages – Spatial Access Methods – Generic Multimedia Indexing Approach – One Dimensional Time Series – Two Dimensional Color Images – Feature Extraction

SEARCHING THE WEB AND LIBRARIES

Searching the Web – Challenges – Characterizing the Web – Search Engines – Browsing – Meta-searchers – Online IR systems –Digital Libraries – Architectural Issues – Document Models, Representations and Access.

Text book(s):

1	Ricardo Baeza-Yate, Berthier Ribeiro-Neto, “Modern Information Retrieval”, Pearson Education Asia, 2nd edition,2005.

Reference(s):

1	G.G. Chowdhury, “Introduction to Modern Information Retrieval”, Neal-Schuman Publishers, 2nd edition, 2003.
2	Daniel Jurafsky and James H. Martin, “Speech and Language Processing”, Pearson Education, 2000.
3	David A. Grossman, Ophir Frieder, “Information Retrieval: Algorithms, and Heuristics”, Academic Press, 2000.
4	Charles T. Meadow, Bert R. Boyce, Donald H. Kraft, “Text Information Retrieval Systems”, Academic Press, 2000.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E34 - SEMANTIC WEB								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100
Objective(s)	• To study about Ontology • To study languages for semantic web • To learn taxonomy for Ontology • To study Ontology tools and applications							
Course Outcomes	**At the end of the course, the students will be able to** 1. Outline the History of Semantic Web Layers 2. Understand Semantics in semantic Web-XML 3. Know the concept of XML Structuring, Query Processing 4. Elaborate web ontology language, OWL Specification, OWL construction 5. Describe the relationship, Schema Browsing RDF/XML, DQL 6. Analyze Logic, Description Logics with suitable examples 7. Understand the examples of Non-monotonic Rules, Motivation, Syntax and examples 8. Enumerate the Uses of RDF Commercial and Noncommercial 9. Establish the applications like e-Learning, Web Services, Web mining 10. Distinguish the Future of Semantic Web							

INTRODUCTION

History – Semantic Web Layers –Semantic Web technologies – Semantics in Semantic Web – XML: Structuring – Namespaces – Addressing – Querying – Processing

WEB RESOURCES

RDF and Semantic Web – Basic Ideas - RDF Specification – RDF Syntax: XML and Non- XML - RDF elements – RDF relationship: Reification, Container, and collaboration – RDF Schema – Editing, Parsing, and Browsing RDF/XML-RQL-RDQL

WEB ONTOLOGY LANGUAGE

Why Ontology – Ontology movement – OWL – OWL Specification - OWL Elements – OWL constructs: Simple and Complex – Ontology Engineering : Introduction – Constructing ontologies – Reusing ontologies – On-To-Knowledge Semantic Web architecture

LOGIC AND INFERENCE

Logic – Description Logics - Rules – Monotonic Rules: Syntax, Semantics and examples – Non-Monotonic Rules – Motivation, Syntax, and Examples – Rule Markup in XML: Monotonic Rules, and Non-Monotonic Rules

APPLICATIONS

RDF Uses: Commercial and Non-Commercial use – Sample Ontology – e-Learning – Web Services – Web mining – Horizontal information – Data Integration – Future of Semantic Web

Text book(s):

1	Grigorous Antoniou and Van Hermelen, “A Semantic Web Primer”, The MITPress, 2nd edition, 2008.

Reference(s):

1	Liyang Yu, “A Developer’s Guide to the Semantic Web”, Springer; 1st Edition, 2011.
2	John Hebeler, Matthew Fisher, Ryan Blace and Andrew Perez-Lopez, “Semantic Web Programming” , Wiley, 1st edition, 2009.
3	“Spinning the Semantic Web: Bringing the world wide web to its full potential” , The MIT Press, 2004.
4	Shelley Powers – “Practical RDF”, O’reilly publishers, 1st Indian Reprint, 2003.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT E35 - HUMAN COMPUTER INTERACTION

IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)	• To understand foundations of human computer interaction • Be familiar with the design technologies for individuals and persons with disabilities • To design various models for interaction and aware of mobile HCI
Course Outcomes	**At the end of the course, the students will be able to** 1. Understand the foundations of Human Computer Interaction 2. Comprehend the text entry and display devices 3. Analyze the Interaction models, frameworks, styles and WIMP interface 4. Analyze the interaction design basics 5. Demonstrate the HCI in the software process 6. Understand the design rules 7. Implement simple graphical user interfaces using tool kits and management 8. Illustrate the evaluation techniques 9. Analyze the cognitive models and architectures 10. Recognize the various communication and collaboration Models

INTRODUCTION

The Human –Input-output channels –Human Memory –Thinking –Emotions –Psychology and design of interactive systems; Computer –Text entry devices-Positioning, Pointing & drawing –Display devices for Virtual reality and 3D interaction.

INTERACTION

Introduction-Models of introduction, Frameworks and HCI, Ergonomics, Interaction styles, Elements of the WIMP interface, Interactivity. Interaction Design Basics: The process design, User focus, Scenarios, Navigation design, Screen design and layout, Iteration and prototyping.

SOFTWARE PROCESS AND DESIGN RULES

HCI in the software process: Introduction, The software life cycle, Usability engineering, Iterative design and prototyping. Design Rules: Introduction-Principles to support Usability -Standards –Guidelines -Golden rules

IMPLEMENTATION SUPPORT AND EVALUATION TECHNIQUES

Implementation support –Windowing system elements –Using tool kits –User interface management ; Evaluation techniques –Goals of Evaluation –Evaluation through expert analysis –Evaluation through User Participation -Universal design principles-Multimodal interaction

MODELS AND THEORIES

Cognitive models –Goal & task hierarchies –Linguistic models –Physical and device models –Cognitive architectures; Communication and collaboration Models –Face-to-Face communication –Conversation –Text based communication –Group working;

Text book(s):

1	Alan Dix , Janet Finlay, Gregory D,Abowd, Russell Beale, “Human Computer Interaction”, 3rd Edition, Pearson Education, 2004.

Reference(s):

1	Julie A. Jacko and Andrew Sears, “The human-computer interaction handbook: fundamentals, evolving technologies, and emerging applications”, Lawrence Erlbaum Associates, Inc., Publishers, 2003.
2	Dov Te‘eni, Jane Carey, Ping Zhang, “Human-Computer Interaction: Developing Effective Organizational Information Systems”, John-Wiley and Sons Inc., 2007.
3	John M.Carrol, “Human Computer Interaction in the New Millenium”, Pearson Education, 2002.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT E36 / 40 IT L05 - MOBILE APPLICATION DEVELOPMENT

IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)	• To appreciate the Mobility landscape and familiarize with Mobile apps development aspects • To design and develop mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications • To develop an app using native hardware play, location awareness, graphics, and multimedia, to perform testing, signing, packaging and distribution of mobile apps
Course Outcomes	**At the end of the course, the students will be able to** 1. Gain Knowledge about of mobility landscape, development approaches and overview of android platform 2. Setting up the mobile app development environment along with an emulator to develop mobile apps 3. Design the app using user interface and mobile UI resources 4. Study about activity and app functionality beyond user interface such as threads, sync tasks and services 5. Gain knowledge about of native data handling and shared preferences 6. Learn mobile databases such as SQLite and enterprise data access 7. Know how to Implement the multimedia, graphics and animation views using APIs 8. Analyze the location awareness and native hardware access methods 9. Recognize the method of testing an android app using various testing tools 10. Identify the method of versioning, signing, packaging and publishing the mobile apps

GETTING STARTED WITH MOBILITY

Mobility landscape, Mobile platforms, Mobile apps development, Overview of Android platform, setting up the mobile app development environment along with an emulator, a case study on Mobile app development

BUILDING BLOCKS OF MOBILE APPS

App user interface designing – mobile UI resources (Layout,UI elements,Draw-able, Menu), Activity- states and life cycle, interaction amongst activities, App functionality beyond user interface - Threads, Async task, Services

BUILDING BLOCKS OF MOBILE APPS

states and lifecycle, Notifications, Broadcast receivers, Telephony and SMS APIs, Native data handling – on-device file I/O, shared preferences, mobile databases such as SQLite, and enterprise data access (via Internet/Intranet)

SPRUCING UP MOBILE APPS

Graphics and animation – custom views, canvas, animation APIs, multimedia – audio/video playback and record, location awareness, and native hardware access (sensors such as accelerometer and gyroscope)

TESTING & TAKING MOBILE APPS TO MARKET

Debugging mobile apps, White box testing, Black box testing, and test automation of mobile apps, JUnit for Android, Robotium, MonkeyTalk - Versioning, signing and packaging mobile apps, distributing apps on mobile market place

Text book(s):

1	Anubhav Pradhan,Anil V.Deshpande, “Composing Mobile Apps: Learn/Explore/Apply/ Using Android”, Wiley India Private Limited, 1st Edition,2014.

Reference(s):

1	Frank Ableson W, Sen R ,Chrisking, “Android in Action”, Dreamtech Press, New Delhi, 3rd Edition,2012.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
41 IT 801 - SOFTWARE QUALITY ASSURANCE AND TESTING								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To learn techniques for ensuring software quality, Practices that support the production of quality software • Be exposed to software testing techniques, methodologies and defects prevention techniques • To explore different testing methods, models with its functionality and taxonomy and implementation of testing tools
Course Outcomes	**At the end of the course, the students will be able to** 1. Recognize the different approaches for managing software organizations and SCM 2. Comprehend the role and plan of SQA, SQA Considerations and SQA people 3. Realize the concept of software inspections and fundamentals of software process 4. Gain knowledge about managing software quality and Defect Prevention 5. Appreciate different models and principles of testing 6. Emphasize the concept of black box and white box approaches 7. Explore the various levels of Testing techniques 8. Comprehend the activity of test management and test organization 9. Identify the taxonomy of testing tools and methodology to evaluate automated testing tools 10. Grasp the techniques of Rational Testing Tools and Java Testing Tools

FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE
Managing Software Organizations - Software Configuration Management - Software Quality Assurance

MANAGING and OPTIMIZING SOFTWARE QUALITY
Software Inspections - Defining the Software Process - Managing Software Quality - Defect Prevention

SOFTWARE TESTING METHODOLOGY
Testing as an Engineering Activity - Testing Maturity Model - Testing Fundamentals - Testing Principles - Black Box Approach - Random Testing - Equivalence Class Partitioning - Boundary Value - Cause and Effect Graphing - White Box Approach - Coverage and Control Flow Graphs - Evaluating Test Adequacy Criteria.

SOFTWARE TESTING TECHNIQUES
Need for Levels of Testing - Unit Testing - Integration Testing - System Testing - Regression Testing - Alpha, Beta and Acceptance Testing. Test Management - Introduction - Test Planning - Test Plan Components - Reporting Test Results - Role of groups in Test Planning - Test Organization

SOFTWARE TESTING TOOLS
Taxonomy of Testing tools, Methodology to evaluate automated testing tools, Rational Testing Tools, Java Testing Tools – JavaMelody – Selenium – JUnit - JMeter- JSUnit.

Text book(s):

1	Watts S Humphrey, “Managing the Software Process”, Pearson Education Inc., 2007.
2	Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2012.

Reference(s):

1	William E. Perry,”Effective Methods for Software Testing”, 3rd Edition, Wiley, 2007.
2	Mordechai Ben Menachem, Garry S. Marliss, “Software Quality”, 1st Edition, Thomson Learning publication, 2000.
3	Kshirasagar Naik, Priyadarshi Tripathy, “Software Testing and Quality Assurance: Theory and Practice”, .Wiley, 2011

K.S. RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT 8P1– PROJECT WORK – PHASE II								
IT								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	0	0	16	240	8	50	50	100

Objective(s)	• To improve the academic and technical skills of the students, choosing the project in one of the technical areas, they have learnt during the course. • To make the students learn to work in teams, gain confidence to solve real world problems related to their area, make presentations and manage a project.
Course Outcomes	**At the end of the course, the students will be able to** 1. Identify engineering problems relevant to the domain and carryout literature survey for its support 2. Analyse and identify an appropriate technique to solve the problem 3. Do experimentation / simulation / programming / Fabrication, collect and interpret data 4. Document, prepare technical report and do power point presentation 5. Demonstrate their responsibility as an individual and a leader in group project work.
Methodology	• A committee is constituted with the project coordinator, project guide and HOD/Senior professor in the department. • Three reviews have to be conducted by the committee • Each review has to be evaluated for 100 marks. • Attendance is compulsory for all reviews. If a student fails to attend review for some valid reason, one or more chance may be given. • A senior professor from other departments may be included in the committee for final review • The report should be submitted as per the format by the students during the first week of April

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E41 - SOCIAL NETWORK ANALYSIS								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To gain knowledge about the current web development and emergence of social web • To study about the modeling, aggregating and knowledge representation of semantic web • To learn about the extraction and mining tools for social networks • To gain knowledge on web personalization and web visualization of social networks
Course Outcomes	**At the end of the course, the students will be able to** 1. Apply knowledge for current web development in the era of Social Web 2. Identify online communities and Web based networks 3. Visualize and represent the online social networks 4. Interpret Hadoop and MapReduce techniques 5. Aggregate and represent knowledge for web community 6. Analyze methods and applications of community mining algorithms 7. Interpret the evolution in social networks 8. Study about social influence and statistical analysis 9. Comprehend text mining and sentimental classification 10. Review mining algorithms to develop social networks

INTRODUCTION

Introduction to Web - Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Statistical Properties of Social Networks - Network analysis - Development of Social Network Analysis - Key concepts and measures in network analysis - Discussion networks - Blogs and online communities - Web based networks.

MODELING AND VISUALIZATION

Visualizing Online Social Networks - A Taxonomy of Visualizations - Graph Representation - Centrality- Clustering - Node-Edge Diagrams - Visualizing Social Networks with Matrix-Based Representations- Node-Link Diagrams - Hybrid Representations - Modelling and Aggregating social network data - Random Walks and their Applications - Use of Hadoop and Map Reduce - Ontological representation of social individuals and relationships.

MINING COMMUNITIES

Aggregating and Reasoning with social network data, Advanced Representations - Extracting evolution of Web Community from a Series of Web Archive - Detecting Communities in Social Networks - Evaluating Communities - Core Methods for Community Detection & Mining - Applications of Community Mining Algorithms - Node Classification in Social Networks.

EVOLUTION

Evolution in Social Networks - Framework - Tracing Smoothly Evolving Communities - Models and Algorithms for Social Influence Analysis - Influence Related Statistics - Social Similarity and Influence - Influence Maximization in Viral Marketing - Algorithms and Systems for Expert Location in Social Networks.

TEXT AND OPINION MINING

Text Mining in Social Networks - Opinion extraction - Sentiment classification and clustering - Temporal sentiment analysis - Irony detection in opinion mining - Wish analysis - Product review mining - Review Classification - Tracking sentiments towards topics over times.

Text book(s):

1	Charu C. Aggarwal, “Social Network Data Analytics”, Springer; 2011.

Reference(s):

1	Peter Mika, “Social Networks and the Semantic Web”, Springer, 1st edition, 2007.
2	Borko Furht, “Handbook of Social Network Technologies and Applications”, Springer, 1st edition, 2010.
3	Guandong Xu , Yanchun Zhang and Lin Li, “Web Mining and Social Networking – Techniques and applications”, Springer, 1st edition, 2011.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E42 – OPEN SOURCE SOFTWARE								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To describe the fundamentals of free open source software and open source operating system like Linux • To acquire knowledge on MySQL database with PHP • To understand the basic knowledge of PERL and PYTHON
Course Outcomes	**At the end of the course, the students will be able to** 1. Compare various Open source operating systems. 2. Recognize the functionality of scheduling in Linux 3. Acquire the knowledge of strings and sorting query in MySQL 4. Analyze the applications using MySQL database 5. Identify the variables and functions with its associated features 6. Classify debugging and error handling techniques in PHP 7. Comprehend basic concepts of objects and string in PYTHON 8. Annotate the concept of errors and exceptions functions 9. Interpret the concept of PERL parsing rules and statements, control structures 10. Comprehend the basic concepts of files and data manipulation

INTRODUCTION

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

OPEN SOURCE DATABASE

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

OPEN SOURCE PROGRAMMING LANGUAGES

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

PYTHON

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

PERL

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

Text book(s):

1	Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003.
2	Steve Suchring, “MySQL Bible”, John Wiley, 2002.

Reference(s):

1	Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O’Reilly, 2002.
2	Wesley J. Chun, “Core Phython Programming”, Prentice Hall, 2001.
3	Martin C. Brown, “Perl: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4	Steven Holzner, “PHP: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E43 - NATURAL LANGUAGE PROCESSING								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To learn the techniques in natural language processing and be familiar with the natural language generation • To describe the application based on natural language processing and to show the points of syntactic and semantic processing • Be exposed to information retrieval and machine translation
Course Outcomes	**At the end of the course, the students will be able to** 1. Recognize the models and algorithms in NLP 2. Comprehend Regular Expressions and Regular Languages 3. Identify the elements and applications of Finite-State Morphological Parsing 4. Analyze the probabilistic models of pronunciation and spelling 5. Build statistical NLP components, such as N-grams language models and spelling 6. Interpret word classes and part-of-speech taggers, which learn from corpora 7. Analyze and parse context-free grammars syntactically 8. Apply semantic parsing to characterize different NLP techniques 9. Recognize information retrieval techniques and transfer metaphor 10. Apprehend and model statistical machine translation

INTRODUCTION

Knowledge in Speech and Language Processing - Ambiguity - Models and Algorithms - Language, Thought, and Understanding - Regular Expressions and Automata: Regular Expressions - Finite-State Automata - Regular Languages and FSAs.

MORPHOLOGY AND FINITE-STATE TRANSDUCERS

Survey of English Morphology - Finite-State Morphological Parsing - Combining FST Lexicon and Rules - Lexicon-free FSTs: The Porter Stemmer- Human Morphological Processing-Probabilistic Models of Pronunciation and Spelling.

N-GRAMS

Counting Words in Corpora - Simple N-grams – Smoothing – Backoff - Deleted Interpolation - N-grams for spelling and Pronunciation - Entropy - Word Classes - Part-of-Speech Tagging.

SYNTACTIC PARSING AND SEMANTIC ANALYSIS

Context-Free Rules and Trees - Sentence-Level Constructions - Finite State & Context-Free Grammars - Parsing with Context - Free Grammars - Syntax-Driven Semantic Analysis - Lexical Semantics.

INFORMATION RETRIEVAL AND MACHINE TRANSLATION

Word Sense Disambiguation and Information Retrieval - Language Similarities and Differences - The Transfer Metaphor - Direct Translation - Using Statistical Techniques - Usability and System Development.

Text book(s):

1	Jurafsky, D. and J. H. Martin., “Speech and language processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition”, 2nd Edition, Prentice-Hall, 2009.

Reference(s):

1	Tanveer Siddiqui, U.S. Tiwary, “Natural Language Processing and Information Retrieval”, 1st edition, Oxford University Press, 2008.
2	Manning, Christopher D., and Hinrich Schutze., “Foundations of Statistical Natural Language Processing”, 2nd Edition, Cambridge, MA: MIT Press, 2000.
3	James Allen, “Natural Language Understanding”, 2nd edition, Benjamin/Cummings publishing company, 1995.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E44 - USER INTERFACE DESIGN								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To study the concept of menus, windows, interfaces • To study about business functions, study the testing methods • To study the characteristics and components of windows • To study the various controls for the windows • To study about various problems in windows design with color, text, graphics
Course Outcomes	**At the end of the course, the students will be able to** 1. Familiar with the importance of good design in user interface 2. Understand about user interface design process 3. Identify the human characteristics in user interface design 4. Make out the principles of good screen design 5. Understand how menus are used, and selecting the proper kinds for specific tasks 6. Familiar with the Device based control and screen based control 7. Understand about effective feedback, guidance and assistance 8. Design multimedia systems like graphics, icons, images, colors 9. Identify effective internationalization and accessibility 10. Familiar with the test and retest in user interface design

INTRODUCTION

Introduction-Importance-Human-Computer interface-characteristics of graphics interface-Direct manipulation graphical system - web user interface-popularity-characteristic & principles

DESIGN PROCESS

User interface design process- obstacles-usability-human characteristics in design - Human interaction speed-business functions- Requirement analysis-Direct-Indirect methods- Basic business functions-Design standards-System timings - Human consideration in screen design

SYSTEM MENUS AND NAVIGATION SCHEMES

Structures of Menus - Functions of Menus- Contents of Menu- Formatting - phrasing the Menu - Selecting Menu choice- Navigating Menus- Graphical Menus

CONTROLS

Windows: Characteristics- Components- Presentation Styles-types-managements-organizations-operations-Web systems- Device-based controls: characteristics- Screen-based controls: Operate control - Text boxes-Selection control- Combination control- Custom control- Presentation control.

WINDOWS LAYOUT AND TEST

Text for Web Pages - Effective feedback-guidance & assistance-Internationalization-Accessibility -Icons-Image-Multimedia -Coloring Windows Layout- Test: prototypes - kinds of Tests – Retest-Case studies.

Text book(s):

1	Wilbent. O. Galitz ,“The Essential Guide to User Interface Design”, 2nd Edition, John Wiley& Sons, Reprint ,2007.

Reference(s):

1	Ben Sheiderman, “Design the User Interface”, Pearson Education, 1998.
2	Alan Cooper, “The Essential of User Interface Design”, Wiley – Dream Tech Ltd., 2002.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E45 - INFORMATION MANAGEMENT								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100
Objective(s)	• To explore the various aspects of database design and modelling • To examine the basic issues in information governance and information integration • To understand the overview of information architecture							
Course Outcomes	**At the end of the course, the students will be able to** 1. Analyze the database design and modeling 2. Realize the trends in Big data systems 3. Recognize the threats involved in OS protection 4. Analyze the legal & ethical principles in computer security 5. Predict the need for Master Data Management 6. Infer Master Data Management for Data Governance 7. Recognize the Information Architecture 8. Classify the varieties of labels 9. Analyze the information lifecycle management 10. Test & deliver big data applications							

DATABASE MODELLING,MANAGEMENT AND DEVELOPMENT

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

DATA SECURITY AND PRIVACY

Program Security, Malicious code and controls against Program threats, OS level protection - Security in Network, Firewalls, Network Security Intrusion detection systems - Legal & Ethical issues in Computer security.

INFORMATION GOVERNANCE

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

INFORMATION ARCHITECTURE

Principles of Information architecture, Anatomy of Information Architecture - Organizing Systems, Navigation systems and Labelling systems, Varieties of labels, Designing labels.

INFORMATION LIFECYCLE MANAGEMENT

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

Text book(s):

1	Alex Berson, Larry Dubov, “Master Data Management And Data Governance”, 2/E, Tata McGraw Hill,2011.
2	Charles P. Pfleeger, Shari Lawrence Pfleeger ,”Security in Computing”,4/E, Prentice Hall,2011.
3	Peter Morville , “Information Architecture for the World Wide Web” O’Reilly Media,3rd Edition,2006.

Reference(s):

1	Jeffrey A.Hoffer, Heikki Topi, V Ramesh, “Modern Database Management”, 10th Edition, Pearson, 2012.
2	http://nosql-database.org/ Next Gen databases that are distributed, open source and scalable.
3	http://ibm.com/big-data-Four dimensions of big data and other ebooks on Big Data Analytics.
4	Jeffrey Carr , “Inside Cyber Warfare: Mapping the Cyber Underworld” ,O’Reilly Media, 2nd Edition, 2011.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT E46 - FOUNDATION SKILLS IN INTEGRATED PRODUCT DEVELOPMENT

IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To facilitate the acquisition of the foundation skills in the process- tools • To adopt the techniques in the Integrated Product Development area of the Engineering Services industry • To provide the requisite understanding towards application of academic topics from engineering disciplines into real world engineering projects
Course Outcomes	**At the end of the course, the students will be able to** 1. Understand various types of products and services 2. Understand the product development methodologies and management 3. Develop product management plan for a new product based on the type of the new product and development methodology 4. Understand requirement engineering and know how to collect, analyze and arrive at requirements for new product development and convert them in to design specification 5. Understand system modeling for system, subsystem and their interfaces and arrive at the optimum system specification and characteristics 6. Conceptualize new product integrating the Hardware, software, controls, electronics and mechanical systems 7. Perform detailed product design 8. Develop prototype plan and coordinate the respective activities with prototype manufacturing facility 9. Develop test specifications and coordinate the respective activities with testing group, validate the product and confirm its performance as per design specification 10. Develop product documentation as required

FUNDAMENTALS OF PRODUCT DEVELOPMENT

Global Trends Analysis and Product decision: Types of various trends affecting product decision - Social Trends - Technological Trends- Economical Trends - Environmental Trends - Political/ Policy Trends - PESTLE Analysis. Introduction to Product Development Methodologies and Management: Overview of Products and Services - Types of Product Development - Overview of Product Development methodologies - Product Life Cycle - Product Development Planning and Management.

REQUIREMENTS AND SYSTEM DESIGN

Requirement Engineering: Types of Requirements - Requirement Engineering - Traceability Matrix and Analysis - Requirement Management. System Modeling - System Optimization - System Specification - Sub-System Design - Interface Design.

DESIGN AND TESTING

Industrial Design and User Interface Design - Introduction to Concept generation Techniques - Concept Screening & Evaluation - Detailed Design: Component Design and Verification - High Level Design/Low Level Design of S/W Programs - S/W Testing - Hardware Schematic - Component design - Layout and Hardware Testing. Prototyping: Types of Prototypes - Introduction to Rapid Prototyping and Rapid Manufacturing. System Integration – Testing - Certification and Documentation - Introduction to Product verification and validation processes - Product Testing standards, Certification and Documentation.

SUSTENANCE ENGINEERING AND END-OF-LIFE SUPPORT

Maintenance and Repair – Enhancements - Obsolescence Management - Configuration Management - EoL Disposal - Software sustenance.

BUSINESS DYNAMICS- ENGINEERING SERVICES INDUSTRY

Overview of Engineering Services Industry - Challenges of Indian Economy - ER& D value chain - Product development in Industry versus Academia. The IPD Essentials - Introduction to vertical specific product development processes - Product development Trade-offs - Intellectual Property Rights and Confidentiality - Security and configuration management.

Text book(s):

1	NASSCOM, "Foundation Skills in Integrated Product Development (FSIPD)", Ist edition, Published by NASSCOM, 2013.

Reference(s):

1	Ulrich, Karl T. and Eppinger, Steven D, "Product Design and Development", 5th edition, Mc-Graw-Hill, 2012.
2	Kevin N. Otto, "Product design-Techniques in Reverse Engineering and New Product Development", Second edition, Pearson New Delhi, 2011.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E51 / 40 IT L01 - E-COMMERCE								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To enable the students to know the basics of E- commerce • To understand the technology infrastructure and business applications in E- commerce • To acquire knowledge in E-commerce payment and security • To learn legal, ethical and privacy issues in E- commerce
Course Outcomes	**At the end of the course, the students will be able to** 1. Outline the basic concepts of E-commerce and physical commerce 2. Identify the economic forces and business models in E-commerce 3. Describe the knowledge of Internet, World Wide Web, FTP, Intranet and extranet 4. Enumerate cryptography, information publishing, web server hardware and software 5. Appraise the process of e-tailing, advertising, e-mail marketing and e-CRM 6. Apply the E-government, EDI, SCM, web auctions, virtual communities & web portals 7. Elaborate E-payments and its characteristics, protocols in the payment system 8. Apply the knowledge of E-cash, E-check and micro payment system 9. Employ legal, ethical, privacy issues and consumer protection in E-commerce 10. Express cyber laws, warranties, taxation and encryption policies in E-commerce

INTRODUCTION TO E-COMMERCE

Electronic commerce and physical commerce - Economic forces – advantages – myths - business models.

TECHNOLOGY INFRASTRUCTURE

Internet and World Wide Web, Internet protocols - FTP, intranet and extranet - cryptography, information publishing technology- basics of web server hardware and software.

BUSINESS APPLICATIONS

Consumer oriented E-commerce – E- tailing and models - Marketing on web – advertising, e-mail marketing, e-CRM, Business oriented E-commerce – E-Government, EDI on the internet, SCM, Web Auctions, Virtual communities and Web portals

E-COMMERCE PAYMENTS AND SECURITY

E payments - Characteristics of payment of systems, protocols, E-cash, E- check and Micro payment systems.

LEGAL AND PRIVACY ISSUES IN E- COMMERCE

Legal, Ethics and privacy issues – Protection needs and methodology – consumer protection, cyber laws, contracts and warranties. Taxation and encryption policies.

Text book(s):

1	Hentry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, “E-Commerce – Fundamentals and Applications”, Wiley India Pvt Ltd, 2007.
2	Gary P. Schneider, “Electronic commerce, Thomson course technology”, 4th annual edition, 2007.

Reference(s):

1	Bharat Bhasker, “Electronic Commerce – Frame work technologies and Applications”, 3rd Edition. Tata McGrawHill Publications, 2008.
2	Kamlesh K.Bajaj and Debjani Nag, “Ecommerce- the cutting edge of Business”, Tata McGraw Hill Publications, 2008.
3	Efraim Turban et al,” Electronic Commerce –A managerial perspective”, Pearson Education Asia, 2006.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E52 - HUMAN RIGHTS								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To sensitize the Engineering students to various aspects of Constitutional Human Rights. • To understand Fundamental law and basic moral rights of UN and India constitutional law. • To learn legal, ethical and NGOs privacy issues in Human rights.
Course Outcomes	**At the end of the course, the students will be able to** 1. Outline the basic concepts of Human rights. 2. Identify the Universal declaration of Civil and Political Rights in human rights. 3. Describe the knowledge of Human rights and international laws. 4. Describe the review of human rights international millennium laws. 5. Appraise the process of U.N security council and policies. 6. Express the U.N economic and social council policies. 7. Describe the knowledge of Human Rights in Indian Constitutions. 8. Identify the knowledge of Human rights commission and act. 9. Appraise the knowledge for human rights haunting ambiguities. 10. Express cyber laws, policies and NGOs activitsm in Anti-human rights.

INTRODUCTION TO HUMAN RIGHTS

Human Rights – Meaning and Universal Protection of Human Rights – U.N bodies Moral commission and Legal Rights. Universal declaration of Civil and Political Rights, Economic, Social and Cultural Rights. International bill of human rights.

THE CONCEPT OF HUMAN RIGHTS AND LAWS

Development of the concept of International laws in19th and 20th centuries – Geneva convention of 1864. United nation of Human Rights, 1945. Review of Human second and Third millennium laws.

HUMAN RIGHTS IN SECURITY COUNCIL

Perspectives of security council in UN Laws –voting rights-Functions and power in UN security, limitations – Economic and social council.

HUMAN RIGHTS IN INDIAN CONSTITUTION

Human Rights in India – Constitutional Provisions / Guarantees-Protection of national Human right commission, court and act – RTI Act.

PERFORMANCE OF NGO's ACTIVITSM

Human Rights of Disadvantaged People — National and State Human Rights haunting ambiguities-Ethical Imperatives – Judicial production-culture – Role of NGO's contemporary human rights activitsm: Anti-human rights-Realism-freedom children.

Text book(s):

1	Kapoor S.K., "Human Rights under International law and Indian Laws", Central Law Agency, Allahabad, 2014.

Reference(s):

1	Chandra U., "Human Rights", Allahabad Law Agency, Allahabad, 2014.
2	Upendra Baxi, "The Future of Human Rights", Oxford University Press, New Delhi.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E53 - KNOWLEDGE MANAGEMENT								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To provide a detailed coverage of knowledge management concepts and methodologies • To attain knowledge to create, design architecture and codification • To comprehend knowledge management program
Course Outcomes	**At the end of the course, the students will be able to** 1. Identify the theoretical perspectives of knowledge myths life cycle, intelligence 2. Become familiar with types of knowledge, human thinking and learning 3. Enumerate the challenges in building knowledge management systems and knowledge creation 4. Describe about knowledge architecture, knowledge sharing and knowledge leadership roles and skills 5. Elaborate the communication relationship to knowledge development and knowledge sharing in organizations 6. Appraise the relationship between knowledge management and a learning organization 7. Apply the modes of knowledge conversion and learn codification tools and procedures 8. Examine testing and Deploy knowledge management/sharing systems 9. Describe transfer methods, KM system tools and association rules 10. Express communication professionals contribute to a firm's knowledge management program

KNOWLEDGE MANAGEMENT

KM Myths – KM Life Cycle – Understanding Knowledge – Knowledge, intelligence –Experience – Common Sense – Cognition and KM – Types of Knowledge – Expert Knowledge – Human Thinking and Learning.

KNOWLEDGE MANAGEMENT SYSTEM LIFE CYCLE

Challenges in Building KM Systems – Conventional vs KM System Life Cycle (KMSLS)– Knowledge Creation and Knowledge Architecture – Nonaka's Model of Knowledge Creation and Transformation. Knowledge Architecture.

CAPTURING KNOWLEDGE

Evaluating the Expert – Developing a Relationship with Experts – Fuzzy Reasoning and the Quality of Knowledge – Knowledge Capturing Techniques, Brain Storming – Protocol Analysis – Consensus Decision Making – Repertory Grid- Concept Mapping –Blackboarding.

KNOWLEDGE CODIFICATION

Modes of Knowledge Conversion – Codification Tools and Procedures – Knowledge Developer's Skill Sets – System Testing and Deployment – Knowledge Testing – Approaches to Logical Testing, User Acceptance Testing – KM System Deployment Issues – User Training – Post implementation.

KNOWLEDGE TRANSFER AND SHARING

Transfer Methods – Role of the Internet – Knowledge Transfer in e-world – KM System Tools – Neural Network – Association Rules – Classification Trees – Data Mining and Business Intelligence – Decision Making Architecture – Data Management – Knowledge Management Protocols – Managing Knowledge Workers.

Text book(s):

1	Elias.M, Award & Hassan M, Ghaziri, "Knowledge Management", Pearson Education 2011.

Reference(s):

1	Shelda Debowski, "Knowledge Management", John Wiley & Sons, 2006.
2	Guus Schreiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel Shadbolt, Walter Van de Velde and Bob, Wielinga, "Knowledge Engineering and Management", Universities Press, 2001.
3	C.W. Holsapple, "Handbooks on Knowledge Management", International Handbooks on Information Systems, vol. 1 and 2, 2003.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E54 - EMBEDDED SYSTEMS AND PROGRAMMING								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100
Objective(s)	• To know the various components within an embedded system have with each other, Techniques of interfacing between processors & peripheral device related to embedded processing • To understand the design tradeoffs made by different models of embedded systems • To apply knowledge gained in software-hardware integration in team-based projects							
Course Outcomes	**At the end of the course, the students will be able to** 1. Identify the basic functional building blocks of embedded systems 2. Recognize the functionality of register and other memory devices 3. Comprehend about shared memory concepts 4. Classify the Cache mapping techniques and dynamic allocation 5. Acquire the knowledge of I/O device timer & counting devices 6. Realize the interfacing of devices in a system 7. Analyze the concept of interrupts and how it occurs in a system 8. Analyze the performance of various scheduling algorithms 9. Recognize the basic concepts of RTOS 10. Utilize the software tools for various applications							

INTRODUCTION

Introduction to functional building blocks of embedded systems – Register – memory devices – ports, timer – interrupt controllers using circuit block diagram representation for each category.

PROCESSOR AND MEMORY ORGANIZATION

Structural units in a processor – selection of processor & memory devices – shared memory – DMA – interfacing processor – memory and I/O units – memory management – Cache mapping techniques – dynamic allocation – Fragmentation.

DEVICES & BUSES FOR DEVICES NETWORK

I/O devices – timer & counting devices – serial communication using I2C – CAN – USB buses – parallel communication using ISA – PCI – PCI/X buses – arm bus – interfacing with devices/ports – device drivers in a system – Serial port & parallel port.

I/O PROGRAMMING SCHEDULE MECHANISM

Intel I/O instruction – Transfer rate, latency – interrupt driven I/O – Non-maskable interrupts – software interrupts – writing interrupt service routine in C & assembly languages – preventing interrupt overrun – disability interrupts – Multi threaded programming – Context switching – premature & non-premature multitasking – semaphores – Scheduling – Thread states – pending threads – context switching – round robin scheduling – priority based scheduling – assigning priorities – deadlock – watchdog timers.

REAL TIME OPERATING SYSTEM (RTOS)

Introduction to basic concepts of RTOS – Basics of real time & embedded system operating systems – RTOS – Interrupt handling – task scheduling – embedded system design issues in system development process – Action plan – use of the target system – emulator – use of software tools.

Text book(s):

1	Rajkamal, 'Embedded System – Architecture, Programming, Design', 2nd Edition, Tata McGraw Hill, 2008.
2	Daniel W. Lewis 'Fundamentals of Embedded Software', 2nd Edition, Prentice Hall of India, 2004.

Reference(s):

1	Steve Heath, "Embedded Systems Design", 2nd Edition, Newnes, 2003.
2	David E.Simon, "An Embedded Software Primer", 1st Edition, Addison-Wesley Professional, 2013.
3	Wayne Wolf, "Computers as Components; Principles of Embedded Computing System Design", Harcourt India, 2nd Edition, Morgan Kaufman Publishers, 2006.
4	Frank Vahid and Tony Givargis, "Embedded Systems Design – A unified Hardware /Software Introduction", 2nd Edition, John Wiley, 2002.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT E55 - FAULT TOLERANT COMPUTING								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)	• To provide a comprehensive view of fault tolerant systems • To understand the basic knowledge of principles in fault tolerant computer architecture and computing • To expose the students to the methods of hardware fault tolerance
Course Outcomes	**At the end of the course, the students will be able to** 1. Define the traditional measures of fault tolerance 2. Discuss the various hardware and processor level fault tolerance techniques used 3. Analyze the error detecting and correcting codes and different types of RAID levels 4. Discuss the common network topologies and their resilience 5. Explain the techniques like N-version programming and recovery blocks 6. Identify the basics of exception Handling and various software reliability models 7. Define check pointing and models for optimal check pointing 8. Identify techniques for check pointing in distributed and shared memory systems 9. Distinguish between symmetric key and public key ciphers 10. Grasp knowledge on techniques to detect fault injection in ciphers

INTRODUCTION

Fault Classification-Types of Redundancy-Basic Measures of Fault Tolerance-Hardware Fault Tolerance: The Rate of Hardware Failures-Failure Rate, Reliability and Mean Time to Failure-Canonical and Resilient Structures-Other Reliability Evaluation Techniques-Fault tolerance Processor level Techniques.

INFORMATION REDUNDANCY

Coding- Resilient Disk Systems-Data Replication: Voting: Hierarchical Organization-Voting: Non-Hierarchical Organization-Primary-Backup Approach-Algorithm-Based Fault Tolerance-Fault-Tolerant Networks: Measures of Resilience-Common Network Topologies and Their Resilience-Fault-Tolerant Routing.

SOFTWARE FAULT TOLERANCE

Acceptance Tests-Single-Version Fault Tolerance-N-Version Programming-Recovery Block Approach-Preconditions, Post conditions, and Assertions- Exception-Handling- Software Reliability Models- Fault-Tolerant Remote Procedure Calls.

CHECKPOINTING

Introduction-Checkpoint Level-Optimal Checkpointing- An Analytical Model-Cache-Aided Rollback Error Recovery (CARER)-Checkpointing in Distributed Systems- Checkpointing in Shared-Memory Systems-Checkpointing in Real-Time Systems-Case Studies: Nonstop Systems- Stratus Systems.

FAULT DETECTION IN CRYPTOGRAPHIC SYSTEMS

Overview of ciphers-Security Attacks Through Fault Injection: Fault Attacks on Symmetric Key Ciphers- Fault Attacks on Public (Asymmetric) Key Ciphers-Counter Measures-Spatial and Temporal Duplication-Error Detecting Codes- Fault Injection.

Text book(s):

1	Israel Koren, Mani Krishna, “Fault Tolerant Systems”, 1st Edition, Elsevier Science & Technology, 2007.

Reference(s):

1.	Lala, P.K., “Self-checking and Fault-Tolerant Digital Design”, Morgan Kaufmann, 2001.
2.	Parag K. Lala “Fault Tolerant and Fault Testable Hardware Design”, Prentice-Hall International, 1985.
3.	Pradhan, Dhiraj K., “Fault-Tolerant Computer System Design”, ISBN 0-13-057887-8, Prentice-Hall PTR, 1996.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT E56 - CLOUD COMPUTING

IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	3	0	0	45	3	50	50	100

Objective(s)

- Understand what the current challenges are in cloud computing
- Understand how to design and implement cloud-based applications
- Know Cloud security and services

Course Outcomes

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

1. Understand Cloud basics with its types and characteristics
2. Measure Cloud's values and exploring cloud stack
3. Know various services and their types such as IaaS, PaaS, SaaS
4. Implement various levels of Virtualization techniques
5. Design Cloud Platform and experiencing Amazon Web services
6. Understand the working of Elastic Compute Cloud and Amazon Storage systems .
7. Explore Cloud services like Windows Azure
8. Comprehend security challenges in Cloud
9. Follow SOA architecture and communications
10. Identify Cloud storage provisioning and their solutions

INTRODUCTION

Introduction to Open source – Open source tools - Cloud computing basics: Defining 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.

CLOUD SERVICES AND APPLICATIONS

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 virtualization-Understanding Hypervisors-Machine Imaging – Porting applications

CLOUD PLATFORMS

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

CLOUD SERVICES AND SECURITY

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

SERVICE ORIENTED ARCHITECTURE AND CLOUD STORAGE

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

Text book(s):

1	Barrie Sosinsky, "Cloud Computing Bible", Wiley Publishing, 2011.

Reference(s):

1	Haley Beard, "Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs", Emereo Pty Limited, 2008.
2	George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud", 1st Edition, O'reilly's Publisher, 2009.
3	Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, "Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet", 1st Edition, Morgan Kaufman Publisher, an Imprint of Elsevier, 2012.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT L02 - WEB DESIGN								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)	• Enhance the knowledge of how to develop a Web page using HTML and CSS • Design the web page using JavaScript • Implement the various approach of database connectivity
Course Outcomes	**At the end of the course, the students will be able to** 1. Identify different types of HTML tags, their functionality and attributes 2. Learn the basics of web services 3. Classify CSS to control the appearance of web pages 4. Denote the background elements and media types 5. Incorporate JavaScript variables, operators and functions in web pages 6. Manipulate HTML forms to validate user inputs 7. Demonstrate various JavaScript object models 8. Create web pages with dynamic styles using java script objects and DOM 9. Write simple PHP application program using web server 10. Demonstrate the database connectivity

INTRODUCTION

Introduction to HTML - Benefits of HTML - Structure of an HTML Document, HTML Tags: Attributes – meta Elements - Linking - Lists- Tables- Forms- Form Elements- Form Attributes - Web services.

CASCADING STYLE SHEETS

Introduction to CSS - Inline Styles - Conflicting Styles- Style Sheets- Positioning Elements – Backgrounds - Dimensions- Text Flow- Media Types - Drop-Down Menu.

SCRIPTING LANGUAGE

Introduction to Scripting Language – Data Types - Variables – Expressions - Operators and Control Statements – Arrays - User Defined Functions - Events.

JAVASCRIPT OBJECTS

JavaScript Objects: String – Math – Date - Boolean and Number – Window – Document - Document Object Model(DOM) - DOM Collections - Dynamic Styles.

IMPLEMENTATION STRATEGIES

Introduction to PHP: Basics - String Processing and Regular Expressions – Form Processing and Business Logic - Connecting to a Database - Using Cookies - Dynamic Content - Operator Precedence Chart - Database Connectivity: SQL: DDL - DML - MySQL: Creating Database in MySQL – Mini Project.

Text book(s):

1	Harvey Deitel, Abbey Deitel, “Internet and World Wide Web How to Program”, 5th Edition, (Harvey & Paul) Deitel & Associates, 2013.

Reference(s):

1	Robert. W. Sebesta, "Programming the World Wide Web", 8th Edition, Pearson Education, 2015.
2	Jeffrey C.Jackson, "Web Technologies-A Computer Science Perspective", Pearson Education, 2007.
3	http://www.w3schools.com/

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT L03 – PYTHON PROGRAMMING								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)	• To know basic programming in Python • To understand modules along with object oriented programming concepts • To know database programming, network programming and graphics programming
Course Outcomes	**At the end of the course, the students will be able to** 1. Apprehend the basics of Python programming 2. Comprehend the decision making and looping in Python 3. Infer module concepts with package importing 4. Expel functions with various types of message passing and handling exceptions 5. Acquire basics of object oriented programming 6. Implement OOP concepts using Python 7. Understand database management and implementing DB connectivity 8. Expel network programming like client server and chat application 9. Understand GUI toolkits like Tkinter 10. Configure various widgets in layout

INTRODUCTION

Introduction to Python – Strings – List – Tuples - Dictionaries – Basic Operators - File Input and Output – Decision Making – Loops

MODULAR DESIGN AND EXCEPTION HANDLING

Modules – Python module – Namespaces – Importing modules – Loading and Execution – Program Routine – Functions – Parameter Passing - Types – Recursion –Exceptions – Types – Handling Exceptions

OBJECT ORIENTED PROGRAMMING

Object Oriented Programming – Class and Objects – Data Abstraction - Encapsulation – Inheritance – Polymorphism

DATABASE PROGRAMMING AND NETWORK PROGRAMMING

Introduction to database – DBM dictionaries – Relational Databases : Writing SQL statements; Defining tables; Setting up a Database – Python database APIs – Network Protocols – Socket Programming – Client Server Program – Chat Application

GUI PROGRAMMING AND GRAPHICS

GUI Programming toolkits – Introduction to Tkinter – Creating GUI widgets – Resizing – Configuring widget options – Creating Layouts – Radio buttons – Check boxes – Dialog boxes – Drawing using Turtle

Text book(s):

1	James Payne, “Beginning Python – using Python 2.6 and Python 3.1”, Wiley India Pvt Ltd, 2010
2	Charles Dierbach, “Introduction to Computer Science using Python”, Wiley India Pvt Ltd, 2015

Reference(s):

1	Wesley J. Chun, “Core Python Applications Programming”, 3rd Edition, Pearson Education, 2013
2	John Paul Mueller, “Beginning Programming with Python”, Wiley India Pvt Ltd, 2014
3	Allen Downey, Jeffrey Elkner, Chris Meyers, “ Learning with Python”, DreamTech Press, 2015

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS								
40 IT L04 - MULTIMEDIA TECHNOLOGIES								
IT								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)	• To expose students to the various aspects of multimedia in relation to appropriate and acceptable design techniques used within these media. • To identify both theoretical and practical aspects in designing multimedia systems surrounding the emergence of multimedia technologies using software technologies. • To identify a range of concepts, techniques and tools for creating and editing the interactive multimedia applications.
Course Outcomes	**At the end of the course, the students will be able to** 1. Comprehend about multimedia, graphics and image data representations. 2. Recognize the color science in image and video along with digital audio. 3. Discuss and use various lossless and lossy multimedia data compression algorithms. 4. Recognize and use various compression techniques for video and audio. 5. Realize multiplexing technologies underlying in multimedia networking. 6. Deduce multimedia network communications and applications. 7. Design Web pages like Adobe Photoshop CS3, CorelDraw and PageMaker. 8. Create animations using web design software like DreamWeaverCS3, Flash CS3 and editing software like Adobe Premier Pro, Adobe after effects. 9. Use Animation software for modeling and simulation of visual effects. 10. Develop virtual reality based applications using VRML.

INTRODUCTION TO MULTIMEDIA

Multimedia and Hypermedia - World Wide Web - Overview of Multimedia software tools - Multimedia authoring - Graphics and Image data representations: Data types, Popular file formats - Color in Image and Video: Color Science, Color models in Images - Color models in video - Basics of Digital audio: MIDI.

MULTIMEDIA DATA COMPRESSION

Lossless Compression algorithms: Run-length coding, Variable length coding, Arithmetic coding, Lossless Image compression - Lossy Compression algorithms: Quantization - Basic video compression techniques: Video compression based on motion compensation, H.261: Intra-frame coding and Inter-frame coding - Basic audio compression techniques: vocoders.

MULTIMEDIA COMMUNICATION AND RETRIEVAL

Computer and multimedia networks: Multiplexing technologies - Multimedia network communications and applications: Quality of multimedia data transmission, Multimedia over IP - Multimedia over wireless networks.

GRAPHICS DESIGN PROGRAMS AND WEB DESIGN SOFTWARE

Graphics design Programs: Adobe Photoshop CS3, CorelDraw and PageMaker - Web design software: DreamWeaverCS3 and Flash CS3 - Editing software: Adobe Premier Pro, Adobe after effects.

ANIMATION SOFTWARE

Introduction to animation - Uses of animation - Computer-based animation - 3D animation - Animation software: 3D Studio Max 9.0, Maya and Sound Forge - Virtual reality - VR applications - VRML.

Text book(s):

1	Ze-Nian Li and Mark S. Drew, “Fundamentals of Multimedia”, Pearson Education, 2004.
2	Ramesh Bangia, “Professional in Multimedia”, Firewall Media, Lakshmi Publications, 2015.

Reference(s):

1	Ranjan Parekh, “Principles of Multimedia”, 2nd edition, Tata McGraw-Hill, 2013.
2	Tay Vaughan, “Multimedia: Making it work”, 7th edition, Tata McGraw-Hill, 2008.

K.S.RANGASAMY COLLEGE OF TECHNOLOGY - AUTONOMOUS

40 IT L06 – CYBER SECURITY

IT

Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)

- To understand the basic structure of information systems.
- To impart the knowledge of web application and testing.
- To enhance system security and can develop basic security enhancements in stand-alone applications.

Course Outcomes

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

1. Identify the components of Information systems
2. Develop basic structure of an information systems
3. Analyze the different SQL injection
4. Identify the process of protecting websites and online services against different security threats
5. Classify the different testing methods
6. Analyze the various testing techniques applied for web security
7. Categorize the security models
8. Compare the different mobile platform security models
9. Perform security testing in the mobile app development
10. Evaluate the various testing strategies in mobile security

INTRODUCTION

Information system components – Information system categories – Individuals in the information systems – Development of Information systems

WEB APPLICATION SECURITY

SQL injection, Cross-site request forgery, Cross-site scripting, Attacks and Defenses, Generating and storing session tokens, Authenticating users, The SSL protocol, The lock icon, User interface attacks, Pretty Good Privacy.

WEB SECURITY TESTING

Introduction and Objectives, Information Gathering, Configuration and Deployment Management Testing, Identity Management Testing, Authentication Testing, Authorization Testing, Input Validation Testing, Testing for weak Cryptography, Client Side Testing

MOBILE PLATFORM SECURITY MODELS

Android – iOSMobile platform security models – Detecting Android malware in Android markets

MOBILE SECURITY TESTING

Mobile platform internals – Security testing in the mobile app development lifecycle – Basic static and dynamic security testing – Mobile app reverse engineering and tampering– Assessing software protections

Reference(s):

1.	Mayank Bhusan, Rajkumar Singh Rathore, Aatif Jamshed,Fundamental of Cyber Security: Principles, Theory and Practices",BPB Publishers, Delhi,2017.
2.	William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010.
3.	Michael T. Goodrich and Roberto Tamassia, Introduction to Computer Security, Addison Wesley, 2011.
4.	William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall,4th edition, 2010.
5	Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, Handbook of Applied Cryptography, CRC Press, 2001.