



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

Sponsored by CMR Educational Society

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)

Maisammaguda, Dhulapally (Post Via. Kompally), Secunderabad – 500100, Telangana State, India.

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BACHELOR OF TECHNOLOGY COMPUTER SCIENCE & ENGINEERING

Course Structure & Syllabus (Batches admitted from the academic year 2015 - 2016)

Note: The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council.

PRELIMINARY DEFINITIONS AND NOMENCLATURES

- "Autonomous Institution /College" means an institution/college designated as autonomous institute / college by University Grants Commission (UGC), as per the UGC Autonomous College Statutes.
- "Academic Autonomy" means freedom to a College in all aspects of conducting its academic programs, granted by the University for promoting excellence.
- "Commission" means University Grants Commission.
- "AICTE" means All India Council for Technical Education.
- "University" the Jawaharlal Nehru Technological University, Hyderabad.
- "College" means Malla Reddy College of Engineering & Technology, Secunderabad unless indicated otherwise by the context.
- "Program" means:
 - Bachelor of Technology (B.Tech) degree program
 - UG Degree Program: B.Tech
- "Branch" means specialization in a program like B.Tech degree program in Electronics & Communication Engineering, B.Tech degree program in Computer Science and Engineering etc.
- "Course" or "Subject" means a theory or practical subject, identified by its course – number and course-title, which is normally studied in a semester.
- T–Tutorial, P–Practical, D–Drawing, L–Theory, C–Credits

FOREWORD

The autonomy is conferred on Malla Reddy College of Engineering & Technology (MRCET) by UGC based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the UGC in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own curriculum, examination system and monitoring mechanism, independent of the affiliating University but under its observance.

Malla Reddy College of Engineering & Technology (MRCET) is proud to win the credence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, and also improving upon the values and beliefs for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several experts drawn from academics, industry and research, in accordance with the vision and mission of the college which reflects the mindset of the institution in order to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications, if needed, are to be sought at appropriate time and with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The Cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the institution and brighter prospects of engineering graduates.

“A thought beyond the horizons of success committed for educational excellence”

PRINCIPAL



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

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VISION

- ❖ To establish a pedestal for the integral innovation, team spirit, originality and competence in the students, expose them to face the global challenges and become technology leaders of Indian vision of modern society.

MISSION

- ❖ To become a model institution in the fields of Engineering, Technology and Management.
- ❖ To impart holistic education to the students to render them as industry ready engineers.
- ❖ To ensure synchronization of MRCET ideologies with challenging demands of International Pioneering Organizations.

QUALITY POLICY

- ❖ To implement best practices in Teaching and Learning process for both UG and PG courses meticulously.
- ❖ To provide state of art infrastructure and expertise to impart the quality education.
- ❖ To groom the students to become intellectually creative and professionally competitive.
- ❖ To channelize the activities and tune them in heights of commitment and sincerity, the requisites to claim the never ending ladder of SUCCESS year after year.

For more information: www.mrcet.ac.in

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **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.
3. **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.
4. **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.
5. **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.
6. **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.
7. **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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.
11. **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 multi disciplinary environments.
12. **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.

COURSE STRUCTURE**I Year B. Tech (CSE) – I Semester**

S.NO	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX.MARKS	
						Int	Ext
1	R15A0001	ENGLISH	3		2	25	75
2	R15A0021	MATHEMATICS-1	5	1	4	25	75
3	R15A0011	ENGINEERING PHYSICS-1	3		2	25	75
4	R15A0013	ENGINEERING CHEMISTRY	4		3	25	75
5	R15A0501	COMPUTER PROGRAMMING WITH C	4		3	25	75
6	R15A0302	ENGINEERING DRAWING	2	3	4	25	75
7	R15A0581	COMPUTER PROGRAMMING LAB	-	3	2	25	50
8	R15A0083	ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB	-	3	2	25	50
9	R15A0081	ENGLISH LANGUAGE COMMUNICATION SKILLS LAB-1	-	3	2	25	50
TOTAL			21	13	24	225	600

I Year B. Tech (CSE) – II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX.MARKS	
						Int	Ext
1	R15A0002	PROFESSIONAL ENGLISH	3		2	25	75
2	R15A0022	MATHEMATICS-II	5	1	4	25	75
3	R15A0012	ENGINEERING PHYSICS-II	3		2	25	75
4	R15A0502	OBJECT ORIENTED PROGRAMMING	4	1	3	25	75
5	R15A0201	ELECTRICAL CIRCUITS	5	-	4	25	75
6	R15A0014	ENVIRONMENTAL STUDIES	4		3	25	75
7	R15A0582	OBJECT ORIENTED PROGRAMMING LAB	-	3	2	25	50
8	R15A0084	IT WORKSHOP/ENGINEERING WORKSHOP	-	3	2	25	50
9	R15A0082	ENGLISH LANGUAGE COMMUNICATION SKILLS LAB - II	-	3	2	25	50
*10	R15A0003	HUMAN VALUES AND SOCIETAL PERSPECTIVES	2	-	-	50	-
TOTAL			26	11	24	275	600

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

II Year B. Tech (CSE) – I Semester

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R15A0503	Mathematical Foundation of Computer Science	4	1	3	25	75
2	R15A0504	Data Structures using C++	5	-	4	25	75
3	R15A0505	Principles of Programming Languages	4	-	3	25	75
4	R15A0024	Probability and Statistics	5	-	4	25	75
5	R15A0401	Electronic Devices and Circuits	4	1	3	25	75
6	R15A0461	Open Elective 1	4	-	3	25	75
	R15A0419	1. Digital Logic Design					
	R15A0418	2. Data Communication 3. Optical Communication					
7	R15A0282	Electrical & Electronics lab	-	3	2	25	50
8	R15A0583	Data Structures using C++ Lab	-	3	2	25	50
*9	R15A0004/ R150005	Foreign Language : French/German	2	-	-	50	
Total			28	8	24	250	550

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

II Year B. Tech (CSE) – II Semester

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R15A0506	Formal Language and Automata Theory	4	1	3	25	75
2	R15A0507	Java Programming	4	1	3	25	75
3	R15A0508	Design and Analysis of Algorithms	4	-	3	25	75
4	R15A0509	Database Management Systems	4	1	3	25	75
5	R15A0510	Computer Organization	4	-	3	25	75
6	R15A0061	Open Elective 2:	4		3	25	75
	R15A0062	1. Managerial Economics and Financial Analysis					
	R15A0063	2. Supply Chain Management 3. Knowledge Management					
7	R15A0584	Database Management Systems Lab	-	3	2	25	50
8	R15A0585	Java Programming Lab	-	3	2	25	50
9	R15A0006	Gender Sensitization	-	3	2	75	
Total			24	12	24	275	550

III Year B. Tech (CSE) – I Semester

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R15A0511	Software Engineering	4	1	3	25	75
2	R15A0512	Compiler Design	5	-	4	25	75
3	R15A0513	Operating Systems	5	-	4	25	75
4	R15A0514	Computer Networks	4	1	3	25	75
5	R15A0515	Core Elective 1	4	-	3	25	75
	R15A0516	1. Advanced Computer Architecture					
	R15A0517	2. Distributed Data Bases 3. Computer Graphics					
6	R15A0064	Open Elective 3	4	-	3	25	75
	R15A0065	1. Enterprise Resource Planning					
	R15A0069	2. Management Science 3. Intellectual Property Rights					
7	R15A0586	Compiler Design Lab	-	3	2	25	50
8	R15A0587	Computer Networks & Operating Systems Lab	-	3	2	25	50
9	R15A0007	Technical Communication and Soft Skills	-	2	-	50	-
Total			26	10	24	250	550

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

III Year B. Tech (CSE) – II Semester

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R15A0518	Object Oriented Analysis and Design	5	-	4	25	75
2	R15A0519	Information Security	5	-	4	25	75
3	R15A0520	Web Technologies	4	1	3	25	75
4	R15A0521	Software Testing Methodologies	4	1	3	25	75
5	R15A0522	Core Elective 2	4	-	3	25	75
	R15A0523	1. Information Security Management (security analyst-1)					
	R15A0524	2. Introduction To Analytics (associate analytics-1)					
	R15A0525	3. Distributed systems 4. Neural Networks					
6	R15A0424	Open Elective 4	4	-	3	25	75
	R15A0426	1. Embedded Systems Design					
	R15A0432	2. Digital Image Processing 3. Wireless Communication and Networks					
7	R15A0588	Case Tools & Web Technologies Lab	-	3	2	25	50
8	R15A0589	Software Testing Methodologies Lab	-	3	2	25	50
Total			26	8	24	200	550

IV Year B. Tech (CSE) – I Semester

S.No	Subject Code	SUBJECT	L	T/P/D	C	Max. Marks	
						Int	Ext
1	R15A0526	Data Warehousing and Data Mining	5	-	4	25	75
2	R15A0527	LINUX Programming	5	-	4	25	75
3	R15A0528	Design Patterns	4	1	3	25	75
4	R15A0529	Cloud Computing	4	1	3	25	75
5	R15A0530	Core Elective 3	4	-	3	25	75
	R15A0531	1. Information Security Assessments & Audits(Security Analyst-2)					
	R15A0532	2. Big-Data Analytics (Associate Analytics-2)					
	R15A0533	3. Mobile Computing					
6	R15A0534	Core Elective 4	4	-	3	25	75
	R15A0535	1. Parallel Processing					
	R15A0536	2. Semantic Web and Social Networks					
7	R15A0590	3. Artificial Intelligence	-	3	2	25	50
8	R15A0591	Data Ware Housing and Data Mining Lab	-	3	2	25	50
Total			26	8	24	200	550

IV Year B. Tech (CSE) – II Semester

S.No	Subject Code	SUBJECT	L	T/P/D	C	Max. Marks	
						Int	Ext
1	R15A0537	Core Elective 5	5	-	4	25	75
	R15A0538	1. Information Security Incident Response and Management (Security Analyst-3)					
	R15A0539	2. Predictive Analytics (Associate Analytics-3)					
	R15A0540	3. Web Services					
2	R15A0541	4. Database Security	5	-	4	25	75
	R15A0542	Core Elective 6					
	R15A0543	1. Scripting Languages					
3	R15A0596	2. Storage Area Networks	-	-	4	-	100
4	R15A0597	3. Software Project Management	-	6	2	50	-
5	R15A0598	Mini Project	15	-	10	100	200
Total			25	6	24	200	450

I Year B. Tech CSE -I Sem

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(R15A0001) ENGLISH

Introduction:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section , as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

Objectives:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

Listening Skills:

Objectives

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation.
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions. Students should be given practice in listening to the sounds of the language to be able to recognize them, to distinguish between them to mark stress and recognize and use the right intonation in sentences.
 - Listening for general content
 - Listening to fill up information
 - Intensive listening
 - Listening for specific information

Speaking Skills:

Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.
 - Oral practice
 - Describing objects/situations/people
 - Role play – Individual/Group activities (Using exercises from all the nine units of the prescribed text: Learning English : A Communicative Approach)
 - Just A Minute (JAM) Sessions.

Reading Skills:

Objectives

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
 - Skimming the text
 - Understanding the gist of an argument
 - Identifying the topic sentence
 - Inferring lexical and contextual meaning
 - Understanding discourse features
 - Scanning the text
 - Recognizing coherence/sequencing of sentences

NOTE : The students will be trained in reading skills using the prescribed text for detailed study.

They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:

Objectives

1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.
 - Writing sentences
 - Use of appropriate vocabulary
 - Paragraph writing
 - Coherence and cohesiveness
 - Narration / description
 - Note Making

- Formal and informal letter writing
- Describing graphs using expressions of comparison

TEXT BOOKS PRESCRIBED:

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Five Units are prescribed in each semester:

For Detailed study

First text book entitled “Skills Annexe: Functional English for Success”, published by Orient BlackSwan, Hyderabad.

For Non-detailed study

Second textbook titled “Epitome of Wisdom”, published by Maruthi Publications, Guntur.

Unit –I:

1. Chapter entitled ‘Mokshagundam Visvesvaraya’ from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.
- L- Listening – Project Based Assignment
S- Speaking – Jam session
R- Reading – The Palm Islands
W- Writing – Writing Paragraphs
G- Grammar – Conjunctions and Adverbs
V- Vocabulary – Prefixes and Suffixes

Unit – II

1. Chapter entitled “Never Never Nest” by Cedric Mount, published in *Ten One Act Plays, 1937*, Willett, Clark and Company, 1937.
- L- Listening – Project Based Assignment
S- Speaking – Role plays—Introduction, Greetings, Requests, Permission
R- Reading – Reading for the plot
W- Writing – Note writing
G- Grammar – Articles, Finite and Non-finite Verbs, Auxiliary Verbs and Nouns
V- Vocabulary – Homophones, Homographs and Homonyms

Unit – III

1. Chapter entitled “Risk Management” from *Skills Annexe -Functional English for Success*, published by Orient Black Swan, Hyderabad.
- L- Listening – Project Based Assignment
S- Speaking – Role plays – Refusal, Apology, and Complimenting
R- Reading – Shivakasi Accident
W- Writing – Note Making and Note Taking
G- Grammar – Tenses and Punctuation
V- Vocabulary – Synonyms and Antonyms

Unit – IV

1. Chapter entitled 'Leela's Friend' from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.
- L- Listening – Project Based Assignment
- S- Speaking – Role plays—Congratulating, Consolation, and Social Etiquettes
- R- Reading – Forensic Science
- W- Writing – Letter Writing
- G- Grammar – Contractions, Questions, Prepositions
- V- Vocabulary – Phrasal Verbs

Unit –V

1. Chapter entitled "Three Days to See" from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.
 - L- Listening – Project Based Assignment
 - S- Speaking – Professional and Telephone Etiquettes
 - R- Reading – Reading for Facts
 - W- Writing – Business Letters, Complaints, Apologies, Requests
 - G- Grammar – Correction of Sentences and Modal Auxiliaries
 - V- Vocabulary – Confused Words
- * Exercises from the texts not prescribed shall also be used for classroom tasks.

REFERENCES :

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi. 2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson.
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw –Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education
10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.
11. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
12. Everyday Dialogues in English, Robert J. Dixon, Prentice Hall India Pvt Ltd.,
13. ABC of Common Errors Nigel D Turton, Mac Millan Publishers.
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education

15. Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw – Hill.
16. An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO
17. A Communicative Grammar of English, Geoffrey Leech, Jan Svartvik, Pearson Education
18. Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,
19. A Grammar Book for You And I, C. Edward Good, MacMillan Publish.

Outcomes:

- Usage of English Language, written and spoken.
- Enrichment of comprehension and fluency.
- Gaining confidence in using language in verbal situation.

I Year B. Tech CSE -I Sem

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(R15A0021) MATHEMATICS – I**Objectives:**

To learn

- The types of Matrices and their properties
- Concept of rank of a matrix and applying the concept of rank to know the consistency of linear equations and to find all possible solutions if exist.
- The concept of eigen values and eigenvectors of a matrix is to reduce a quadratic form into a canonical form through a linear transformations.
- The mean value theorems and to understand the concepts geometrically.
- The functions of several variables and optimization of these functions.
- The evaluation of improper integrals, Beta and Gamma functions.
- Multiple integration and its applications.
- Methods of solving the differential equations of 1st and higher order cooling, Natural growth and decay, bending of beams etc.
- The definition of integral transforms and Laplace Transform.
- Properties of Laplace Transform.
- Inverse Laplace Transform.
- Convolution theorem.
- Solution of Differential equations using Laplace transform.

UNIT - I: Matrix Theory

Introduction to matrices- Elementary row and column operations on a matrix- Finding rank of a matrix by reducing to Echelon and Normal forms-Consistency of system of linear equations (homogeneous and non- homogeneous) using the rank of a matrix-Cayley - Hamilton Theorem (without proof) – Verification- finding inverse of a matrix and powers of a matrix by Cayley-Hamilton theorem- Linear dependence and Independence of Vectors- Eigen values and eigen vectors of a matrix-Properties of eigen values and eigen vectors of real and complex matrices.

UNIT – II: Differential Calculus

Mean Value Theorms: Rolle’s Theorem – Lagrange’s Mean Value Theorem – Cauchy’s mean value Theorems with geometrical interpretations (all theorems without proof)- verification of the Theorems and testing the applicability of these theorems to the given function- Taylor’s series -Maclaurin’s series.

Functions of Several Variables: Jacobian-Functional dependence- Maxima and Minima of functions of two variables without constraints and with constraints - Method of Lagrange multipliers.

UNIT – III: Ordinary Differential Equations of First Order and Applications

Formation of differential equation- Solution of D.E - Variable Separable form- Homogeneous-Non homogeneous- Exact-Non Exact-Linear and Bernoulli's equations- Applications of first order differential equations – Newton's Law of cooling- Law of natural growth and decay- Orthogonal trajectories

UNIT - IV: Linear Differential Equations of Higher Order and Applications

Linear differential equations of second and higher order with constant coefficients- Non-homogeneous term of the type $f(x) = e^{ax}$, $\sin ax$, $\cos ax$, x^n , $e^{ax} V$ and $x^n V$ - Method of variation of parameters-Applications to bending of beams, Electrical circuits and simple harmonic motion.

UNIT – V Laplace Transforms and Applications

Definition of Laplace transform- Domain of the function and Kernel for the Laplace transforms- Existence of Laplace transform- Laplace transform of standard functions- first shifting Theorem,-Laplace transform of functions when they are multiplied or divided by "t"- Laplace transforms of derivatives and integrals of functions – Unit step function – second shifting theorem – Dirac's delta function- Periodic function – Inverse Laplace transform by Partial fractions-Inverse Laplace transforms of functions when they are multiplied or divided by "s", Inverse Laplace Transforms of derivatives and integrals of functions- Convolution theorem –Solving ordinary differential equations by Laplace transforms.

TEXT BOOKS:

1. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.

REFERENCES:

1. Advanced Engineering Mathematics by R.K. Jain & S.R.K. Iyengar, 3rd edition, Narosa Publishing House, Delhi.
2. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
3. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.
4. Engineering Mathematics – I by G. Shankar Rao & Others I.K. International Publications.

Outcomes:

- After learning the contents of this Unit the student is able to write the matrix representation of a set of linear equations and to analyze solutions of system of equations.
- The student will be able to understand the methods of differential calculus to optimize single and multivariable functions.
- The student is able to evaluate the multiple integrals and can apply the concepts to find the Areas, Volumes, Moment of Inertia etc., of regions on a plane or in space.

- The student is able to identify the type of differential equation and uses the tight method to solve the differential equations. Also able to apply the theory of differential equations to the real world problems.
- The student is able to solve certain differential equations using Laplace Transform. Also able to transform functions on time domain to frequency domain using Laplace transforms.

I Year B. Tech CSE -I Sem

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(R15A0011) ENGINEERING PHYSICS – I**Objectives:**

- To help the student to design powerful light sources for various Engineering Applications and also enable them to develop communication systems using Fiber Technology.
- To understand the behavior of electron in a solid and thereby one can determine the conductivity and specific heat values of the solids.
- To study applications in Engineering like memory devices, transformer core and Electromagnetic machinery.
- To understand the working of Electronic devices, how to design acoustic proof halls and understand the behavior of the materials at Nano Scale.

Unit-I

OPTICS: Coherence-Coherent sources, Introduction to Interference, Theory of interference fringes, Types of interference-Interference by division of wave front, Interference in thin films by reflected light, Interference due to division of amplitude- Newton's rings, applications of Newton's rings, Diffraction-types of diffraction, Difference between interference and diffraction, Diffraction due to single slit, Diffraction-Plane transmission grating.

POLARIZATION: Introduction to Polarization, representation of various polarized lights, Brewster law, and law of Maults.

Unit-II

LASERS: Basic principle in lasers, Characteristics of lasers, spontaneous and stimulated emissions, Einstein's Coefficients, Population inversion, Metastable state, pumping, lasing action, Types of lasers-Ruby, He-Ne & semi conductor lasers, Application of lasers.

FIBER OPTICS: Advantages of optical fiber over conventional communication system. Basic principle of an optical fiber, Construction and working of optical fiber, Types of optical fibers -step and graded index, mode and propagation of wave, Numerical aperture and Acceptance angle of an optical fiber, Attenuation, Applications of optical fiber in sensors.

Unit-III

PRINCIPLES OF QUANTUM MECHANICS: Inadequacy of classical mechanics, Fundamentals of wave mechanism-wave nature and particle nature-DeBroglie dual nature of light, matter waves, Experimental evidence of deBroglie dual nature, Davisson & Germer's experiment, Heisenberg uncertainty principle, One dimensional time independent Schrodinger wave equation-Physical significance of wave function, Schrödinger equation in One dimensional infinite potential box.

Unit-IV

ELEMENTS OF STATISTICAL MECHANICS:

Statistical distribution-Micro and Macro states, Ensembles, M.B, B.E, and F.D distributions, Density of states factor, Inadequacy of electron theory of metals, Band theory, Bloch theorem-Kronig Penny model-EK curve-Effective mass of electron, Formation of energy bands in solids, Classification of solids in conductors, semi conductors and insulators with energy level diagrams.

Unit-V

SEMICONDUCTOR PHYSICS: Types of semiconductors, Carrier concentration of electrons in intrinsic semi conductor, Fermi level in intrinsic semiconductor, Carrier concentration & Fermi level of extrinsic semi conductors. Direct and Indirect band gaps of semi conductor. Hall effect.

SEMICONDUCTOR DEVICES: Formation of PN junction diode, Energy level diagram of PN junction diode. I-V characteristics of PN junction diode-PN junction as half wave rectifier and full wave rectifier,PN junction diode as LED and Solar cell.

TEXT BOOKS:

1. Engineering Physics, V.Rajendran, Tata Mc Graw Hill Book Publishers.
2. A Text Book of Engg Physics – M.N.Avadhanulu & P.G.Khsirsagar S.Chand & Co.(for Acoustics)
3. Modern Physics – R. Murugesan & K.Siva Prasath – S.Chand & Co.

REFERENCES:

1. Fundamental of Physics, David Halliday, Robert Resnick, Jearl Walker by John Wiley & Sons.
2. Introduction to Solid Physics – A.J.Dekker (Macmillan).
3. Applied physics for Engineers – P.Madhusudana Rao (Academic Publishing Company,2013)
4. Solid State Physics – S.O Pilli, New Age Publishers.
5. Engineering Physics, Phalanisamy, Scitech Publications
6. Nanotechnology – M.Ratner & D.RATner (Pearson Ed.).
7. Applied Physics – Mani Naidu, Pearson Education.

Outcomes:

- The student would be able to learn the fundamental concepts on behavior of crystalline solids.
- The Knowledge on Fundamentals of Quantum Mechanics, Statistical Mechanics enables the student to apply to various systems like communications Solar Cells, Photo Cells and so on.

- Design, Characterization and study of properties of materials help the student to prepare new materials for various Engineering applications.
- This course also helps the student exposed to non-destructive testing methods.
- Finally, Engineering Physics course helps the student to develop problem solving skills and analytical skills.

I Year B. Tech CSE -I Sem

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4	-/-/-	3

(R15A0013) ENGINEERING CHEMISTRY**Objectives:**

- To impart the basic concepts and ideas in chemistry
- To develop scientific attitudes and enable the students to correlate the concepts of chemistry with the core programmes.
- Electrochemistry unit give conceptual knowledge about spontaneous processes and how can they be harnessed for producing electrical energy and efficiency of systems. Fuel cells which are the alternate energy sources for generating electrical energy on spot and portable applications.
- Knowledge to prevent corrosion of machinery and metallic materials and water chemistry which require serious attention in view of increasing pollution has been included in the syllabus.
- Understand various techniques involved in polymerization and application of polymer technology in the area of various engineering fields and manufacturing process of important metallurgical materials.
- To learn about types of fuels and their characteristics, and combustion systems with emphasis on engineering applications.

Unit -I

Electrochemistry: Concept of Electrochemistry – Conductance - Specific, Equivalent and Molar conductance and their units. Applications of Conductance (Conductometric titrations). Single electrode potential; **EMF:** Galvanic Cells, Types of Electrodes–(Calomel, Quinhydrone and glass electrodes); determination of P^H using glass electrode; Potentiometric titrations, Nernst equation and its applications; electro chemical series and its applications; Numerical problems.

Batteries: Primary and secondary cells (lead-Acid cell, Ni-Cd cell, lithium cells). **Fuel cells** - Hydrogen -Oxygen fuel cell; Advantages and Applications.

Unit- II:

Corrosion and its Control: Causes and effects of corrosion; Theories of corrosion – Chemical (oxidation corrosion) & Electrochemical corrosion; Factors affecting rate of corrosion – Nature of metal (position of metal in galvanic series, overvoltage, relative areas of anodic and cathodic parts, purity of metal and passivity) and Nature of Environment (temperature, humidity and pH effect)

Corrosion control methods: Cathodic protection (sacrificial anodic and impressed current cathodic protection). Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (galvanization & tinning), cladding, electroplating (Cu plating) and Electroless plating – advantages and applications (Ni plating)

Unit- III:

Engineering Materials

Polymers: Classification of Polymers, Types of Polymerization (Chain growth, Step growth & Zeigler Natta) **Plastics:** Thermoplastic & Thermosetting resins, Preparation, properties, engineering applications of PVC, Teflon and Bakelite. **Fibers-** Characteristics of fibers – preparation, properties and uses of Nylon – 6,6 and Dacron – Fiber Reinforced Plastics (FRP) – applications. **Rubbers**–Natural rubber and vulcanization. **Elastomers**–Buna-S, Butyl and Thiokol rubber; Conducting polymers: Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers. Bio-degradable Polymers- Applications of Poly vinyl acetate and Poly lactic acid.

Lubricants: Classification with examples- Characteristics of a good lubricant & properties of lubricants: viscosity-viscosity index, Cloud point, pour point, flash and fire points.

Refractories:

Classification, characteristics of a good refractory and applications.

Nanomaterials:

Introduction and applications of nanomaterials.

Unit- IV:

Water and its Treatment:

Hardness of Water: Causes of hardness, expression of hardness – units – types of hardness, determination of hardness of water by EDTA method - numerical problems. Boiler troubles – Scale & sludges, Priming and foaming, caustic embrittlement and boiler corrosion; Treatment of boiler feed water – Internal treatment (Phosphate, Colloidal and Calgon conditioning) – External treatment–Zeolite process and ion exchange process. **Potable Water-** Its Specifications–Disinfection of water by chlorination and ozonisation, break point chlorination; Desalination-Reverse Osmosis, and its significance.

Unit-V:

Fuels & Combustion:

Fuels – Characteristics of a good fuel, Classification – solid fuels: coal – analysis of coal - proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining – cracking – types – fixed bed catalytic cracking. Knocking – octane and cetane rating, anti-knocking agents, synthetic petrol, Fischer-Tropsch's process: Gaseous fuels - constituents, characteristics and applications of natural gas, LPG and CNG.

Definition-Calorific value of fuel – HCV, LCV; Determination of calorific value by Junker's gas calorimeter.

TEXT BOOKS:

1. Engineering Chemistry by Bharathi Kumari and Jyotsna Cherukuri, VGS Techno Series (2013)
2. Engineering Chemistry by R.P. Mani, K.N. Mishra, B. Rama Devi /CENGAGE learning

(2013)

3. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).

REFERENCE BOOKS

1. Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Co.
2. Engineering Chemistry by N.Y.S Murthy, Pearson, New Delhi
3. Engineering Chemistry by B. Siva Shankar Mc.Graw Hill Publishing Company Limited, New Delhi (2006)
4. Engineering Chemistry J.C. Kuriacase & J. Rajaram, Tata McGraw Hills Publishing Company Limited, New Delhi (2004).
5. Text Book of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co Publishers, New Delhi(2006)
6. Chemistry of Engineering Materials by C. VAgarwal, C.P Murthy, A. Naidu, BS Publications.

Outcomes:

- Familiarize the student with the fundamentals of the treatment technologies and the considerations for its design and implementation in water treatment plants.
- Understand the operating principles of various types of electrochemical cells, including fuel cells and batteries.
- Analyze and develop a technically sound, economic and sustainable solution to corrosion problems related to engineering service.
- Be able to apply core concepts in Materials Science to solve engineering problems
- To learn about types of fuels and their characteristics, and combustion systems with emphasis on engineering applications.
- Recently modern materials synthesized find applications in industry and creating instruments for solving problems of electronics, telecommunications, health care, agriculture, and technology etc., In order to emphasize the above the topics like composite materials, polymers, conducting polymers and nanomaterials have been incorporated in the curriculum.

I Year B. Tech CSE -I Sem

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(R15A0501) COMPUTER PROGRAMMING WITH C**Objectives**

- To understand the various steps in Program development.
- To understand the basic concepts in C Programming Language.
- To learn how to write modular and readable C Programs
- To learn to write programs (using structured programming approach) in C to solve problems.
- To introduce the students to basic data structures such as lists, stacks and queues.
- To make the student understand simple sorting and searching methods

UNIT - I

Introduction to Computing – Computer Systems, Computing Environments, Computer Languages, Creating and running programs, Software Development Life Cycle, Algorithm, Flowchart.

Introduction to C – History of C, Features Of C, Structure Of C Program, Character Set, C Tokens-keywords, Identifiers, Constants, Data types, Variables, Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversion, Statements- Selection Statements(Decision Making) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, other statements related to looping –break, continue, goto.

UNIT-II

Functions-Designing Structured Programs, Types of Functions- user defined functions, Standard Functions, Inter function communication, Categories of functions ,Parameter Passing techniques, Scope, Storage classes-auto, register, static, extern, Type qualifiers, Recursion- recursive functions, Preprocessor commands.

UNIT – III

Arrays – Declaration and Initialization, Inter Function Communication, Array Applications, Two dimensional arrays, Multi dimensional arrays.

Strings – Declaration and Initialization, String Input / Output functions, Arrays of strings, String manipulation functions.

UNIT-IV

Pointers- Introduction, Definition and uses of pointers, address operator, Pointer variables, Pointer constants ,dereferencing pointers, void pointers, Pointer arithmetic, Pointers to Pointers, Pointers and Arrays, Pointers and Functions, Pointers to functions, Array of pointers, Pointers and Strings.

UNIT-V

Structures and Unions - Introduction, Declaration and Initialization, Structure within a structure, Operations on structures, Array of Structures, Pointer to Structures, Structures and Functions, Self referential structures, Typedef, enum, bitfields, Unions.

Files – Concept of a file, Streams, Text files and Binary files, Opening and Closing files, File input / output functions, File Status functions (Error handling), Positioning functions, Command line arguments.

TEXT BOOKS:

1. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Mastering C, K.R.Venugopal, S R Prasad, Tata McGraw-Hill Education.

REFERENCE BOOKS:

1. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI.
2. Computer Programming, E.Balagurusamy, First Edition, TMH.
3. C and Data structures – P. Padmanabham, Third Edition, B.S. Publications.
4. Programming in C, *Ashok Kamthane*. Pearson Education India.
5. Let us C, Yashwanth Kanethkar, 13th Edition, BPB Publications.

Outcomes:

- Demonstrate the basic knowledge of computer hardware and Software.
- Ability to apply solving and logical skills to programming in C language and also in other languages.

I Year B. Tech CSE -I Sem

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(R15A0302) ENGINEERING DRAWING**UNIT – I**

Introduction To Engineering Drawing: Principles of Engineering Drawing/Graphics – Various Drawing Instruments – Conventions in Drawing – Lettering practice – BIS Conventions.

- a) Polygons-Construction of Regular Polygons (General methods only no special methods).
- b) Conic Sections Including Rectangular Hyperbola
- c) Cycloid, Epicycloid and Hypocycloid
- d) Scales-Plain, Diagonal and Vernier Scales

UNIT – II

Projection: Principles of Orthographic Projections – Conventions – First and Third Angle projections.

Projections of Points. Points in all four quadrants.

Projections of Lines - Parallel, perpendicular inclined to one plan and inclined to both planes. True length and true angle of a line. Traces of a line.

Projections Of Planes: Plane parallel, perpendicular and inclined to one reference plane. Plane inclined to both reference planes.

UNIT – III

Projections Of Solids: Projections of regular solids, cube, prisms, pyramids, cylinder and cone, axis inclined to both planes.

Sections and sectional views: Right regular solids-prism, Cylinders, Pyramid, Cone,

Development of surfaces: Development of surfaces of Right Regular solids-Prism, Cylinder, Pyramids, Cone and their parts. Frustum of solids.

UNIT – IV

Intersection of solids: Intersection of cylinders Vs cylinder, Cylinders Vs Prism , Cylinder Vs Cone.

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Plane Figures, Simple and Compound Solids.

UNIT – V

Perspective projections: Perspective view: Points, Lines, Planes and solids, Visual Ray and vanishing point methods.

Transformation Of Projections: Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects

TEXT BOOKS

1. Engineering Drawing – Basant, Agrawal, TMH
2. Engineering Drawing, N.D. Bhatt
3. Engineering Drawing by K.Venu Gopal & V.Prabu Raja New Age Publications.

REFERENCES :

1. Engineering drawing – P.J. Shah .S.Chand Publishers.
2. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.
3. Engineering Drawing – M.B. Shah and B.C. Rana, Pearson.

I Year B. Tech CSE -I Sem

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(R15A0581) COMPUTER PROGRAMMING LAB**Objectives:**

- Understand the basic concept of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming
- Acquire knowledge about the basic concept of writing a program.
- Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
- Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
- Role of Functions involving the idea of modularity.
- Concept of Array and pointers dealing with memory management.
- Structures and unions through which derived data types can be formed
- File Handling for permanent storage of data or record.
- Programming using gcc compiler in Linux.

Week 1:

- Write a C program to find sum and average of three numbers.
- Write a C program to find the sum of individual digits of a given positive integer.
- Write a C program to generate the first n terms of the Fibonacci sequence.

Week 2:

- Write a C program to generate prime numbers between 1 to n.
- Write a C program to Check whether given number is Armstrong Number or Not.
- Write a C program to evaluate algebraic expression $(ax+b)/(ax-b)$.

Week 3:

- Write a C program to check whether given number is perfect number or Not.
- Write a C program to check whether given number is strong number or not.

Week 4:

- Write a C program to find the roots of a quadratic equation.
- Write a C program perform arithmetic operations using switch statement.

Week 5:

- Write a C program to find factorial of a given integer using non-recursive function.
- Write a C program to find factorial of a given integer using recursive function.

Week 6:

- Write C program to find GCD of two integers by using recursive function.
- Write C program to find GCD of two integers using non-recursive function.

Week 7:

- Write a C program to find both the largest and smallest number in a list of integers.
- Write a C Program to Sort the Array in an Ascending Order
- Write a C Program to find whether given matrix is symmetric or not.

Week 8:

Revision of programs

Week 9:

- a) Write a C program to perform addition of two matrices.
- b) Write a C program that uses functions to perform Multiplication of Two Matrices.

Week 10:

- a) Write a C program to use function to insert a sub-string in to given main string from a given position.
- b) Write a C program that uses functions to delete n Characters from a given position in a given string.

Week 11:

- a) Write a C program using user defined functions to determine whether the given string is palindrome or not.
- b) Write a C program that displays the position or index in the main string S where the sub string T begins, or - 1 if S doesn't contain T.

Week 12:

- a) Write C program to count the number of lines, words and characters in a given text.
- b) Write a C program to find the length of the string using Pointer.

Week 13:

- a) Write a C program to Display array elements using calloc() function.
- b) Write a C Program to Calculate Total and Percentage marks of a student using structure.

Week 14:

- a) Write a C program that uses functions and structures to perform the following operations:
 - i) Reading a complex number
 - ii) Writing a complex number
 - iii) Addition of two complex numbers
 - iv) Multiplication of two complex numbers
- b) Write a C program to display the contents of a file.

Week 15:

- a) Write a C program to copy the contents of one file to another.
- b) Write a C program to merge two files into a third file.
- c) Write a C program to reverse the first n characters in a file.

Week 16:

Revision Of Programs

TEXT BOOKS

1. C Programming and Data Structures, P.Padmanabham, Third Edition, BS Publications
2. Computer programming in C.V.RAjaraman, PHI Publishers.
3. C Programming, E.Balagurusamy, 3rd edition, TMH Publishers.
4. C Programming, M.V.S.S.N Venkateswarlu and E.V.Prasad,S.Chand Publishers
5. Mastering C,K.R.Venugopal and S.R.Prasad, TMH Publishers.

Outcomes:

- Acquire knowledge about the basic concept of writing a program.
- Understand the Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
- Learn how to use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
- Understand the Role of Functions involving the idea of modularity.
- Understand the Concept of Array and pointers dealing with memory management.
- Learn Structures and unions through which derived data types can be formed
- Learn File Handling for permanent storage of data or record.

I Year B. Tech CSE -I Sem

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(R15A0083) ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB**ENGINEERING PHYSICS LAB****(Any EIGHT experiments compulsory)****Objectives:**

This course on Physics lab is designed with 10 experiments in an academic year. It is common to all branches of Engineering in B.Tech 1st year.

The objective of the course is that the student will have exposure to various experimental skills which is very essential for an Engineering student.

The experiments are selected from various area of Physics like Physical Optics, Lasers, Fiber Optics, Sound, Mechanics, Electricity & Magnetism and Basic Electronics.

Also the student is exposed to various tools like Screw gauge, Vernier Callipers, Physics Balance, Spectrometer and Microscope.

1. The Rigidity modulus (η) of the material of the wire using a Torsional pendulum.
2. Frequency of a vibrating bar, or a tuning fork using Melde's Experimental Arrangement
3. CR Circuit
4. Dispersive power of the material of the given prism-Spectrometer
5. Solar cell characteristics
6. Single slit diffraction Using laser
7. L.C.R. Circuit
8. Determination of the wavelength of sodium light and or (b) the radius of curvature of the surface of the Plano convex lens by forming Newton's rings.
9. Numerical Aperture In Optical Fibers
10. LED Characteristics

LABORATORY MANUAL:

1. Laboratory Manual of Engineering Physics by Dr.Y.Aparna & Dr.K.Venkateswara Rao (V.G.S Publishers)
2. Engineering Physics Lab Manual by Dr. C .V. Madhusudhana Rao & V.Vasanth Kumar (SciTech Publishers)

Outcomes:

- The student is expected to learn from this laboratory course the concept of error and its analysis. It also allows the student to develop experimental skills to design new experiments in Engineering.
- With the exposure to these experiments the student can compare the theory and correlate with experiment.

ENGINEERING CHEMISTRY LAB

List of Experiments (Any Eight experiments compulsory)

Titrimetry:

1. Estimation of hardness of water by EDTA method.
2. Estimation of alkalinity of water.

Mineral analysis:

3. Estimation of manganese dioxide in pyrolusite.

Instrumental Methods:

Colorimetry:

4. Determination of ferrous iron in cement by colorimetric method
5. Estimation of copper by colorimetric method

Conductometry:

6. Conductometric titration of strong acid vs strong base.
7. Conductometric titration of mixture of acids vs strong base.

Potentiometry:

8. Titration of strong acid vs strong base by potentiometry.

Preparation:

9. Preparation of Phenol Formaldehyde Resin
10. Preparation of Aspirin

Physical properties:

11. Determination of viscosity of sample oil by Redwood Viscometer.
12. Determination of Surface tension of liquid by Stalagmometer

TEXT BOOKS:

1. Inorganic quantitative analysis, Vogel.
2. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
3. Laboratory manual of Engineering Chemistry by Y. BharathiKumari and JyotsnaCherukuri (VGS Techno series)

I Year B. Tech CSE -I Sem

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(R15A0081) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The **Language Lab** focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Objectives

- To facilitate computer aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Syllabus: English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab**b. Interactive Communication Skills (ICS) Lab**

The following course content is prescribed for the **English Language Communication Skills Lab**

Exercise –I

CALL Lab: Introduction to Phonetics –Speech Sounds –Vowels and Consonants- Transcriptions

ICS Lab: Ice-Breaking activity - JAM session

Exercise –II

CALL Lab: Pronunciation- Mispronounced sounds, Silent letters-Past Tense Markers and Plural Markers

ICS Lab: Situational Dialogues –Role Plays - Expressions in Various Situations –Self-introduction and Introducing Others –Greetings –Apologies –Requests- Refusal- Permissions – Complementing – Congratulating - Consoling

Exercise -III

CALL Lab: Syllable and Syllabification

ICS Lab: Etiquette – Social and Professional Telephone Etiquette

Outcomes:

- Better Understanding of nuances of language through audio-visual experience and group activities.
- Neutralization of accent for intelligibility
- Speaking with clarity and confidence thereby enhancing employability skills of the students.

I Year B. Tech CSE -II SEM

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(R15A0002) PROFESSIONAL ENGLISH**Introduction:**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

Objectives:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:**Listening Skills:****Objectives**

- 1) To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation.
 - 2) To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions. Students should be given practice in listening to the sounds of the language to be able to recognize them, to distinguish between them to mark stress and recognize and use the right intonation in sentences.
- Listening for general content
 - Listening to fill up information

- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

- 1) To make students aware of the role of speaking in English and its contribution to their success.
- 2) To enable students to express themselves fluently and appropriately in social and professional contexts.
 - Oral practice
 - Describing objects/situations/people
 - Role play – Individual/Group activities (Using exercises from all the nine units of the prescribed text: Learning English : A Communicative Approach)
 - Just A Minute (JAM) Sessions.

Reading Skills:

Objectives

- 1) To develop an awareness in the students about the significance of silent reading and comprehension.
- 2) To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
 - Skimming the text
 - Understanding the gist of an argument
 - Identifying the topic sentence
 - Inferring lexical and contextual meaning
 - Understanding discourse features
 - Scanning the text
 - Recognizing coherence/sequencing of sentences

NOTE : The students will be trained in reading skills using the prescribed text for detailed study.

They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:

Objectives

- 1) To develop an awareness in the students about writing as an exact and formal skill
- 2) To equip them with the components of different forms of writing, beginning with the lower order ones.
 - Writing sentences
 - Use of appropriate vocabulary

- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Five Units are prescribed in each semester:

For Detailed study

First text book entitled “Skills Annexe: Functional English for Success”, published by Orient BlackSwan, Hyderabad.

For Non-detailed study

Second textbook titled “Epitome of Wisdom”, published by Maruthi Publications, Guntur.

Unit –I:

1. Chapter entitled “The Road Not Taken”, a poem by Robert Frost, from *A Selection of Robert Frost’s Poems (Owl Book)*, by Holt Paperbacks: 2 Revised Edition. 2002.

L- Listening – Project Based Assignment on poem ‘If’ by Rudyard Kipling

S- Speaking – Describing Persons and Places

R- Reading – Comprehending Poem

W- Writing – Business Circulars and Notices

G- Grammar – Adjectives, Comparison of Adjectives

V- Vocabulary – Similes and Metaphors

Unit – II

1. Chapter entitled “Human Values and Professional Ethics” from *Skills Annexe -Functional English for Success*, published by Orient Black Swan, Hyderabad.

L- Listening – Project Based Assignment

S- Speaking – Description of Objects, Events and Experiences

R- Reading – What I Cherish the Most

W- Writing – CV and Cover Letter (Self-Appraisal Letter)

G- Grammar – Transitive and Intransitive Verbs

V- Vocabulary – Collocations

Unit – III

1. Chapter entitled “The Convocation Speech” from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.

L- Listening – Project Based Assignment

- S- Speaking – Giving Directions and Instructions
- R- Reading – What is meant by Entrepreneurship?
- W- Writing – Essay Writing (On-the-Spot Organization of Thoughts)
- G- Grammar – Active and Passive Voices
- V- Vocabulary – One-word Substitutes

Unit – IV

1. Chapter entitled “The Last Leaf” from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.
- L- Listening – Project Based Assignment
 - S- Speaking – Oral Presentations
 - R- Reading – Reading Comprehension
 - W- Writing – Report Writing
 - G- Grammar – Concord
 - V- Vocabulary – Idiomatic Expressions

Unit –V

1. Chapter entitled “Sachin Tendulkar” from *Skills Annexe -Functional English for Success*, published by Orient Black Swan, Hyderabad.
- L- Listening – Project Based Assignment
 - S- Speaking – Project Oral Presentations
 - R- Reading – Reading Articles
 - W- Writing – E-mail Writing
 - G- Grammar – Common Errors
 - V- Vocabulary – Misspelt Words

* Exercises from the texts not prescribed shall also be used for classroom tasks.

REFERENCES:

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi. 2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson.
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw –Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education

10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.
11. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
12. Everyday Dialogues in English, Robert J. Dixon, Prentice Hall India Pvt Ltd.,
13. ABC of Common Errors Nigel D Turton, Mac Millan Publishers.
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education
15. Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw – Hill.
16. An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO
17. A Communicative Grammar of English, Geoffrey Leech, Jan Svartvik, Pearson Education
18. Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,
19. A Grammar Book for You And I, C. Edward Good, MacMillan Publish.

Outcomes:

- Usage of English Language, written and spoken.
- Enrichment of comprehension and fluency.
- Gaining confidence in using language in verbal situations.

I Year B.Tech CSE -II SEM

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5	1/-/-	4

(R15A0022)MATHEMATICS-II**Objectives:**

- The objective of interpolation is to find an unknown function which approximates the given data points.
- The objective of curve fitting is to find the relation between the variables x and y from given data and such relationships which exactly pass through the data (or) approximately satisfy the data under the condition of sum of least squares of errors.
- The aim of numerical methods is to provide systematic methods for solving problems in a numerical form using the given initial data and also used to find the roots of an equation and to solve differential equations.
- Numerical methods are important because finding an analytical procedure to solve an equation may not be always available.
- In the diverse fields like electrical circuits, electronic communication, mechanical vibration and structural engineering, periodic functions naturally occur and hence their properties are very required. Indeed, any periodic and non periodic function can be best analyzed in one way by Fourier series method.
- PDE aims at forming a function with many variables and also their solution methods .Method of separation of variables technique is learnt to solve typical second order PDE.
- In many engineering fields the physical quantities involved are vector valued functions. Hence the unit vector calculus aims at basic properties of vector-valued functions and their applications to line, surface and volume integrals.

UNIT – I: Solution of Algebraic and Transcendental Equations and Interpolation

Solution of Algebraic and Transcendental Equations: Introduction – Graphical interpretation of solution of equations .The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method .

Interpolation: Introduction-Errors in polynomial interpolation-Finite differences- Forward Differences- Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial-Newton’s formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae – Interpolation with unevenly spaced points-Lagrange’s Interpolation formula.

UNIT – II : Numerical techniques and Curve Fitting

.Numerical integration: Generalized Quadrature-Trapezoidal rule, Simpson’s $1/3^{\text{rd}}$ and $3/8^{\text{th}}$ Rule.

Numerical solution of Ordinary Differential equations: Solution by Taylor's series method – Picard's Method of successive Approximation- single step methods-Euler's Method-Euler's modified method, Runge-Kutta Methods.

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

UNIT – III: Fourier series

Definition of periodic function. Fourier expansion of periodic functions in a given interval of length 2π . Determination of Fourier coefficients – Fourier series of even and odd functions – Half-range Fourier sine and cosine expansions-Fourier series in an arbitrary interval .

UNIT-IV: Partial differential equations

Introduction -Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and non-linear equations (Charpit's method), Method of separation of variables for second order equations.

UNIT – V : Vector Calculus

Introduction- Scalar point function and vector point function, Gradient- Divergence- Curl and their related properties - Laplacian operator, Line integral – work done – Surface integrals -Volume integral. Green's Theorem,Stoke's theorem and Gauss's Divergence Theorems (Statement & their Verification).

PRESCRIBED TEXT BOOKS:

1. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi & Others, S. Chand.
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers.

REFERENCES:

1. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
2. Introductory Methods by Numerical Analysis by S.S. Sastry, PHI Learning Pvt. Ltd.
3. Higher Engineering Mathematics by B.S. Grewal, Khanna Publications.

Outcomes:

- From a given discrete data, one will be able to predict the value of the data at an intermediate point and The student will be able to find a approximate root of a given equation.
- By curve fitting, one can find the most appropriate formula for a guesses relation of the data variables. This method of analysis data helps engineers to understand the system for better interpretation and decision making. and will be able to find a numerical solution for a given differential equation.
- One will be able to find the expansion of a given function by Fourier series.
- After studying this unit, one will be able to find a corresponding Partial Differential Equation for an unknown function with many independent variables and to find their solution.

- The student will be able to evaluate multiple integrals(line, surface volume integrals) and convert line integrals to area integrals and surface integrals to volume integrals.
- After studying this unit, one will be able to find a corresponding Partial Differential Equation for an unknown function with many independent variables and to find their solution.
- Most of the problems in physical and engineering applications , problems are highly non-linear and hence expressing them as PDEs'.Hence understanding the nature of the equation and finding a suitable solution is very much essential.
- After studying this unit, one will be able to evaluate multiple integrals(line, surface volume integrals) and convert line integrals to area integrals and surface integrals to volume integrals.
- It is an essential requirement for an engineer to understand the behavior of the physical system.

I Year B.Tech CSE -II SEM

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3	/-/-	2

(R15A0012) ENGINEERING PHYSICS-II**Objectives:**

- To understand the basics of bonding in solids , crystal structures and characterization techniques.
- To make the students aware of X-ray diffraction and different techniques of it.
- To understand the behavior of dielectric materials, magnetic materials and nano materials.

UNIT-I

Bonding in Solids: Types of bonds- Primary, Secondary, Forces between atoms, Expression for cohesive energy between two atoms.

Crystallography: Introduction, Lattice points, Space lattice, Basis, Unit cell, lattice parameters, Crystal systems, Bravais lattices, Atomic number, coordination number, packing factor of SC,BCC,FCC crystals, Lattice planes, miller indices. Expression for inter planar distance in cubic crystal.

UNIT- II

X-ray Diffraction: Bragg's law, Experimental techniques -Laue's method, powder method. Applications of x-ray diffraction.

DEFECTS IN CRYSTALS: Types of crystal defects, Point defects-Vacancies, Interstitials, Estimation of defect concentrations of Schottky and Frenkel defects, Line defects- edge dislocation and screw dislocation. Burger's vector.

UNIT-III

Dielectric Properties: Electric dipole, Dipole moment, Polarization vector (P) Displacement vector (D), Dielectric constant (K), Electric susceptibility (χ).types of polarizations-Expression for Electronic and Ionic polarization (Qualitative). Internal fields in dielectrics Classius Mosotti relation. Ferro electricity and Piezo electricity, Applications of dielectric materials.

ULTRASONICS: Introduction-generation of Ultrasonic waves-piezoelectric and magnetostriction method. Properties and Detection of Ultrasonic waves, NDT.

Unit-IV

Magnetic Properties: Magnetic permeability, Field intensity, Magnetic field induction, Magnetization, Magnetic susceptibility, Magnetic moment, Bhor magneton. Classification of magnetic materials-Dia, Para and Ferro. Ferri and Anti ferro magnetic materials. Explanation of Hysteresis loop on the basis of domain theory of ferromagnetism. Soft and hard magnetic materials.

SUPER CONDUCTIVITY: Super conductivity, General properties of super conductivity Meissner effect, Types of super conductors, Applications of super conductors.

UNIT-V

Nano SCIENCE & NANO technology: Nano scale. Types of Nano materials-Surface to volume ratio and Quantum confinement. Synthesis of Nano materials-Bottom up Fabrication and Top down Fabrication- Sol gel, Bcs Theory, Physical Vapour Deposition. Characterisation of Nano particles –XRD and SEM . Applications of Nano materials.

TEXT BOOKS:

- 1 .Engineering Physics, Dr M Arumugam, Anuradha Publishers
2. A Text Book of Engineering Physics –P. G. Kshirsagar– S. Chand

REFERENCES:

1. Introduction to Solid State Physics – C. Kittel (Wiley Eastern).
2. Nanotechnology – M. Ratner & D. Ratner (Pearson Ed.).

Outcomes:

- The students would be able to learn the fundamental concepts on behavior of crystalline solids.
- The student will be able to think about the applications of dielectric, magnetic and nano materials.
- Finally Engineering physics course help the student to develop problem solving skills and analytical skills.

I Year B.Tech CSE-II SEM

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(R15A0502)OBJECT ORIENTED PROGRAMMING

Objectives

- To teach the student the concepts of object oriented and generic programming.
- To differentiate between object oriented programming and procedural programming.
- To design applications using object oriented features
- To teach the student to implement object oriented concepts

Unit I

Concepts of Object Oriented programming: Object oriented paradigm - Basic concepts of Object Oriented Programming - differences between Object Oriented Programming and Procedure oriented programming, Overview of OOP principles, Encapsulation, Inheritance and Polymorphism. Benefits of OOP. Structure of a C++ program, Program structure, namespace, Data types, identifiers, variables, constants, enum, operators, typecasting, control structures & loops.

Unit-II

Functions, Classes and Objects:

Introduction of Classes, Class Definition, Defining a Members, Objects, Access Control, Class Scope, Scope Resolution Operator, Inline functions, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Default Arguments, Function Overloading, Friend Functions

Unit-III

Constructors, Destructors, Inheritance:

Introduction to Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic initialization of Objects, Copy Constructors, Dynamic Constructors, Destructors.

Inheritance :Introduction to inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi-Level Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Abstract Classes, Constructors in Derived Classes, Operator overloading, Rules for Operator overloading, overloading of binary and unary operators .

Unit-IV

Pointers, Virtual Functions and Polymorphism:

Introduction, Memory Management, new Operator and delete Operator, Pointers to Objects, this Pointer, Pointers to Derived Classes, Polymorphism, compile time polymorphism, Run time polymorphism, Virtual Functions, Pure Virtual Functions, Virtual Base Classes, Virtual Destructors.

Unit-V.

Templates and Exception handling:

Introduction, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters, Member Function Templates.

Basics of Exception Handling, Types of exceptions, Exception Handling Mechanism, Throwing and Catching Mechanism, Rethrowing an Exception, Specifying Exceptions

Streams I/O: Stream classes hierarchy, Stream I/O, File streams and String streams, Error handling during file operations

Text Books:

1. Object Oriented Programming with C++ by Balagurusamy
2. C++, the Complete Reference, 4th Edition, Herbert Schildt, TMH.

References:

1. C++ Primer, 3rd Edition, S.B.Lippman and J.Lajoie, Pearson Education.
2. The C++ Programming Language, 3rd Edition, B.Stroutstrup, Pearson Educ

I Year B.Tech CSE -II SEM

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(R15A0201)ELECTRICAL CIRCUITS**Objective:**

This course introduces the basic concepts of network and circuit analysis which is the foundation of the Electrical Engineering discipline. The emphasis of this course is laid on the basic analysis of circuits which includes network analysis, single phase AC circuits, network theorems and transformers.

Unit –I:

Introduction to Electrical Circuits: Concept of Network and Circuit, Types of elements, Types of sources, Source transformation. R-L-C Parameters, Voltage–Current relationship for Passive Elements (for different input signals –Square, Ramp, Saw tooth and Triangular), Kirchhoff's Laws.

Unit –II:**Network Analysis:**

Network Reduction Techniques-Resistive networks, Inductive networks and capacitive networks- Series, Parallel, Series-Parallel combinations, Star–to-Delta and Delta-to-Star Transformation. Mesh Analysis and Super mesh, Nodal Analysis and Super node for DC Excitation. Network topology-Definitions, Graph, Tree, Basic Cut set and Basic Tie set Matrices for Planar Networks.

Unit-III:

Single Phase A.C. Circuits: Average value, R.M.S. value, form factor and peak factor for different periodic wave forms. J-notation, Complex and Polar forms of representation. Steady State Analysis of series R-L-C circuits. Concept of Reactance, Impedance, Susceptance, Admittance, Phase and Phase difference. Concept of Power Factor, Real, Reactive and Complex power.

Unit –IV:

Network Theorems (D.C&A.C): Thevenin's, Norton's, Maximum Power Transfer, Superposition, Reciprocity, Tellegen's, Substitution, Compensation and Milliman's theorems.

Unit –V:

Transformers: Principle of operation, constructional details, Types, Ideal transformer and practical transformer, Losses, Equivalent circuit, Phasor diagram on No load and load, Efficiency and regulation, OC test and SC test.

TEXT BOOKS:

1. Engineering Circuit Analysis - William Hayt, Jack E. Kemmerly, S M Durbin, Mc Graw Hill Companies.
2. Electric Circuits - A.Chakrabarhty, Dhanpat Rai & Sons.

3. A Text book of Electrical Technology by B.L Theraja and A.K Theraja, S.Chand publications.

REFERENCE BOOKS:

1. Network analysis by M.E Van Valkenburg, PHI learning publications.
2. Network analysis - N.C Jagan and C. Lakhminarayana, BS publications.
3. Electrical Circuits by A Sudhakar ,Shyammohan and S Palli, Mc Graw Hill Companies.
4. Principles of Electrical Engineering by V.K Mehta, Rohit Mehta, S.Chand publications.

Outcome:

- After going through this course the student gets a thorough knowledge on basics of network and circuit concepts, circuit elements, network analysis, single phase AC circuits, network theorems, transformers with which he/she can able to apply the above conceptual things to real-world problems and applications.

I Year B.Tech. CSE - II Sem

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(R15A0014)ENVIRONMENTAL STUDIES**Objectives:**

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations

Unit-I:

Introduction: Definition of Environment and Environmental Sciences.

Ecosystems: Definition, Scope and Importance of ecosystem. Brief Classification, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles (Carbon, Oxygen, Nitrogen, Water cycle) Bioaccumulation, Biomagnification, and carrying capacity, Field visits.

Unit-II:

Natural Resources: Classification of Resources: water resources: use and over utilization of surface and ground water, Dams: benefits and problems. Forest resources, Deforestation, Energy resources: renewable and non renewable energy sources, use of alternate energy source,

Unit-III:

Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation.

Unit-IV:

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, **Water pollution:** Sources and types of pollution, **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. Solid waste and its effect, composition and characteristics of e-Waste and its management.

Global Environmental Problems and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Acid rain
Natural Hazards (Droughts, Floods, Cyclone, Landslides, Earthquake, Tsunami) and Disaster Management, Carbon Footprint.

Unit-V:

Environmental Policy, Legislation & EIA: Environmental Protection act, Air Act- 1981, Water Act, Forest Act, Wild life Act-Endangered species act, Municipal solid waste management

and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. International conventions / Protocols: Earth summit, Kyoto protocol and Montréal Protocol.

EIA: EIA structure, methods of baseline data acquisition. Concepts of Environmental Management Plan (EMP).

Towards Sustainable Future: Concept of Sustainable Development, Population and its explosion, Environmental Education, Concept of Green Building.

TEXT BOOKS:

1. Environmental Studies by Anubha Kaushik, 4th Edition, New age international Publishers.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.
3. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
4. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha For University Grants Commission

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M.Masters and Wendell P. Ela.2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B.Botkin & Edward A.Keller, Wiley INDIA edition.
4. Principles of Environmental Science by William. P. Cunningham & Mary Inn Cunningham Tata McGRAW –Hill Publishing Company Ltd.
5. Environmental Studies by S. Rama Lakshmi & Purnima Smarath Kalyani Publishers.

Outcomes:

- Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of Ecological principles and environmental regulations which in turn helps in sustainable development.

I Year B.Tech. CSE- II Sem

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(R15A0582)OBJECT ORIENTED PROGRAMMING LAB**Objectives:**

- To strengthen problem solving ability by using the characteristics of an object-oriented approach.
- To design applications using object oriented features
- To handle Exceptions in programs.
- To teach the student to implement object oriented concepts

Week 1:

Study of C++ Standard library functions.

Week2:

- Write a C++ program to find the sum of individual digits of a positive integer.
- Write a C++ program to generate the first n terms of the sequence.

Week 3:

- Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
- Write a C++ program to find both the largest and smallest number in a list of integers.

Week 4:

- Write a C++ program to sort a list of numbers in ascending order.
- Write a C++ program that uses function templates to find the largest and smallest number in a list of integers.and to sort a list of numbers in ascending order.
- Write aProgram to illustrate New and Delete Keywords for dynamic memory allocation

Week 5

- Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
- Program to illustrate default constructor, parameterized constructor and copy constructors
- Write a Program to Implement a Class STUDENT having Following Members:

Member	Description
Data members	
sname	Name of the student
Marks array	Marks of the student
total	Total marks obtained
tmax	Total maximum marks

Member functions	
Member	Description
assign()	Assign Initial Values
compute()	to Compute Total, Average
display()	to Display the Data.

Week 6:

- Write a Program to Demonstrate the i)Operator Overloading.ii) Function Overloading.
- Write a Program to Demonstrate Friend Function and Friend Class.

Week 7:

- Write a Program to Access Members of a STUDENT Class Using Pointer to Object Members.
- Write a Program to Generate Fibonacci Series use Constructor to Initialize the Data Members.

Week 8:

Revision laboratory

Week 9

Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:

- Reading a matrix.
- Addition of matrices.
- Printing a matrix.
- Subtraction of matrices.
- Multiplication of matrices

Week 10

Write C++ programs that illustrate how the following forms of inheritance are supported:

- Single inheritance
- Multiple inheritance
- Multi level inheritance
- Hierarchical inheritance

Week 11

- Write a C++ program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class.
- Write a Program to Invoking Derived Class Member Through Base Class Pointer.

Week 12

Write a Template Based Program to Sort the Given List of Elements.

Week 13

- Write a Program Containing a Possible Exception. Use a Try Block to Throw it and a Catch Block to Handle it Properly.

b) Write a Program to Demonstrate the Catching of All Exceptions.

Week 14

Write a C++ program that uses functions to perform the following operations to:

- i. Insert a sub-string in to the given main string from a given position.
- ii. Delete n characters from a given position in a given string.

Week 15

- a) Write a C++ program to display the contents of a text file.
- b) Write a C++ program which copies one file to another.

Week 16

Revision

Text Books:

1. Object Oriented Programming with C++ by Balagurusamy
2. C++, the Complete Reference, 4th Edition, Herbert Schildt, TMH.

References:

1. C++ Primer, 3rd Edition, S.B.Lippman and J.Lajoie, Pearson Education.
2. The C++ Programming Language, 3rd Edition, B.Stroutstrup, Pearson Education.

I Year B. Tech CSE -II Sem

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(R15A0084) IT WORKSHOP LAB / ENGINEERING WORKSHOP**Objective:**

The IT Workshop for engineers is a training lab course. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, Power Point and Publisher.

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered.

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX.

PC Hardware**Week 1:**

Task 1: Generations of computers, Types of Computers, applications of computers Von Neumann architecture. Identify the different hardware components of a PC & their functions.

Task 2: practice to disassemble and assemble the components of a PC to working condition.

Week 2:

Task 3 : Installation of windows operating system in PC.

Task 4: Exposure to Basic commands in MS-DOS commands like ver, vol, date, time, cls, dir, md, cd, path, rd, copy con, type, copy, move, del, ren, prompt, ipconfig etc.

Week 3:

Task 5: Installation of operating systems LINUX and different packages on a PC.

Task 6: Exposure to Basic commands in Linux General Purpose utilities like man, who, tty, clear, date, cal, passwd; File Handling utilities like pwd, mkdir, rmdir, cp, rm, mv, cat, cd, ls, ln; Filters like wc, cmp, diff, head, tail, sort.

Week 4:

Task 7: Practice hardware troubleshooting exercises related to various components of computer like monitor, drives, memory devices, printers etc. and software troubleshooting related to BIOS etc.

NETWORKING

Week 5:

Task 8: Students should get to know about some of the Communication and Transmission devices, Network cabling, Features of Networking, Communication Protocols, Types of Network Topologies and Types of Networks.

Internet & World Wide Web

Week 6:

Task 9: Orientation & Connectivity Boot Camp and surfing the Web using Web Browsers: Students should get connected to their Local Area Network and access the Internet. In the process they should configure the TCP/IP setting and demonstrate how to access the websites and email. Students customize their web browsers using bookmarks, search toolbars and pop up blockers.

Week 7:

Task 10: Search Engines and Netiquette (Demonstration): Students should know about different search engines and their usage. A few topics would be given to the students for which they need to search on Google etc.

Week 8:

Task 11: Cyber Hygiene (Demonstration): Awareness of various threats on the internet. To install antivirus software and to configure their personal firewall and windows update on their computers.

Productivity Tools

Documentation

Week 9:

Task 12: Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007. Importance of LaTeX and MS office 2007. Give the details about LaTeX/MS word accessing, overview of toolbars, saving files and Using help and resources.

Week 10:

Task 13: Using LaTeX/Word to create project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option and Mail merge in LaTeX/Word.

Week 11:

Task 14: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Presentation

LaTeX /MS Power Point

Week 12:

Task15: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Week 13:

Task 16: Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Excel

Week 14:

Task 17: Excel Orientation: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the two tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Week 15:

Task 18: Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text.

Week 16:

Task 19 : Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, standard deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP, Sorting, Conditional formatting.

REFERENCE BOOKS:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken.
3. Quamme. – CISCO Press, Pearson Education.
4. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft).

Outcomes:

- Apply knowledge for computer assembling and software installation
- Ability how to solve the trouble shooting problems.
- Apply the tools for preparation of PPT, Documentation and budget sheet etc.

ENGINEERING WORKSHOP

1. TRADES FOR EXERCISES:

At least two exercises from each trade:

1. Carpentry
2. Fitting
3. Tin-Smithy and Development of jobs carried out and soldering.
4. Black Smithy
5. House-wiring

1. TRADES FOR DEMONSTRATION & EXPOSURE:

1. Plumbing
2. Machine Shop
3. Welding
4. Foundry
5. Metal Cutting (Water Plasma)

TEXT BOOK:

1. Work shop Manual - P.Kannaiah/ K.L.Narayana/ Scitech Publishers.
2. Workshop Manual / Venkat Reddy/ BS Publications/Sixth Edition

I Year B. Tech CSE -II Sem

L T/ P/ D C
- -/3/- 2**(R15A0082) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB-II**

The Language Lab focuses on the production and practice of sounds of language and Familiarises the students with the use of English in everyday situations and contexts.

Objective

- To facilitate computer aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

EXERCISE –IV**CALL Lab:** Word Accent – Rules of Stress and Stress shift**ICS Lab:** Describing Object, Places, Persons, Events and Experiences.**EXERCISE –V****CALL Lab:** Intonation Types**ICS Lab:** Giving Instructions and Directions**EXERCISE –VI****CALL Lab:** Neutralisation of Mother Tongue Influence**ICS Lab:** Oral Presentations Team and Individual**GRAMMAR EXERCISES:** Articles, Prepositions, Concord, Correction of Sentences**VOCABULARY EXERCISES:** Antonyms, Synonyms, One word substitutes, Prefix and Suffixes.**PROJECTS**

Students have to choose one of the following projects for their internals, and submit before the end of the semester. This project carries 25 marks.

1. Conduct interview using interrogative sentences.

Students should interview any teacher, or HOD, or Principal, record their responses and submit the project with those questions and answers. The questions asked should not be less than ten.

2. Project on differences between group discussion and debate.

Students are supposed to do research on the differences between GD and debate and submit a project on it. There should be a minimum of ten points with detailed explanation. Students can use pictures as well.

3. Book Review

Choose any fiction of your choice and write a book review on the following parameters.

- Characterization, plot, theme, message

Please note that the review is not the summary of the story. The project should not be less than 250 words.

4. Idioms and Phrasal Verbs

Collect at least ten idioms and ten phrasal verbs and concoct a story using those expressions. Word limit is 250.

5. Project on Kinesics

Students are expected to read and research on body language and their implications. You have to make a list of at least ten body movements with pictures and explain them properly.

6. UK and US vocabulary

Find words that are used differently in UK and US English. Make separate lists for different spellings and different pronunciations. The project can answer one or more of the following questions:

- Which pronunciation do you think are Indians following?
- Which one is your choice? Which one do you feel comfortable in speaking?
- Are we Indians influenced by both UK and US English? How can you prove it?

7. Magazine Article Review

Pick a magazine article with a social relevance, which has around 2500 words. Write a review of 250 words as a project. Make sure you voice your opinion in the review.

8. Career Guidance Project

Browse the net and gather information on any professional competitive exam of your choice, like UPSC or GRE. Prepare and present a paper on the scope and relevance of the exam of your choice. The paper should have a minimum of 300-400 words. Students are expected to answer the questions asked by the audience after the paper presentation.

9. Mother Tongue Influence

Choose a particular paragraph of 250 words and ask five of your friends, from different states, to read that. One has to record their accent and pronunciation to check the difference. Make a list of ten words that each one pronounces differently. Find out the reasons behind the differences in pronunciations.

Also, mention the correct pronunciation in your project with transcription.

10. Correction of Letter Writing: Language, Sentences, Spelling, Tone and Format

Teacher will distribute a set of five letters with errors in spelling, tone, grammar and sentence construction. Give the correct form of the letters as the project

ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self-study by learners.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

- i) P –IV Processor
 - a) Speed –2.8 GHZ
 - b) RAM –512 MB Minimum
 - c) HardDisk –80 GB
- ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab :

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
2. Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
3. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
4. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
5. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
6. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
7. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
8. Nambiar, K.C. 2011. Speaking Accurately. A Course in International Communication. New Delhi: Foundation
9. Soundararaj, Francis. 2012. Basics of Communication in English. New Delhi: Macmillan
10. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
11. English Pronouncing Dictionary Daniel Jones Current Edition with CD.
12. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Examination:

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution

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**(R15A0003) HUMAN VALUES AND SOCIETAL PERSPECTIVES
(MANDATORY COURSE)**

Objective: This introductory course input is intended

- To help the students appreciate the essential complementarity between ‘VALUES’ and skills’ to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective form the basis of Value based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.

Unit-I:

Course Introduction – Need, Basic Guidelines, Content and Process of Value Education: Understanding the need, basic guidelines, content and process for value Education. Self Exploration-What is it? Its content and process; ‘Natural Acceptance’ and Experiential validation-as the mechanism for self exploration. Continuous Happiness and Prosperity-A look at basic Human Aspirations. Right understanding , Relationship and physical Facilities – the basic requirements for fulfillment of aspirations of every human being with their correct priority. Understanding Happiness and prosperity correctly – A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Unit-II:

Understand Harmony in the Human Being – Harmony in Myself: Understanding human being as a co-existence of the sentient ‘I’ and the material ‘Body’ understanding the needs of self (‘I’) and ‘Body’-Sukh and Suvidha. Understanding the body as an instrument of ‘I’(I being the does, seer and enjoyer). Understanding the characteristics and activities of ‘I’ and harmony in ‘I’ . Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of physical needs, meaning of prosperity in detail. Programs to ensure sanyam and Swasthya.

Unit-III:

Understanding Harmony in the Family and Society-Harmony in Human-Human Relationship: Understanding harmony in the Family – the basic unit of human interaction. Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti: **Trust (Vishwas) and Respect (Samman) as the**

foundational values of relationship. Understanding the meaning of Vishwas: Difference between intention and competence. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship. Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals. Visualizing a universal harmonious order in society – Undivided society(Akhand Samaj), Universal Order (Sarvabhaum Vyawastha) –from family to world family!

Unit-IV:

Understanding Harmony in the Nature and Existence – Whole existence as Co-existence: Understanding the harmony in the Nature. Interconnectedness and mutual fulfillment among the four orders of nature recyclability and self-regulation in nature. Understanding Existence as Co-existence (SAh-astiva) of mutually interacting units in all –pervasive space. Holistic perception of harmony at all level of existence.

Unit-V:

Implications of the above Holistic Understanding of Harmony on Societal Perspectives: Natural acceptance of human values. Definitiveness of Ethical Human Conduct. Basis of Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in Societal Perspectives:

- a) Ability to utilize the professional competence for augmenting universal human order.
- b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems.
- c) Ability to identify and develop appropriate technologies and management patterns for above production system.

Case studies of typical holistic technologies, management models and production systems. Strategy for transition from the present state to Universal Human Order:

- a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers.
- b) At the level of society: as mutually enriching institutions and organizations.

TEST BOOKS

1. R R Gaur, R Sangal, G P BAgaria, 2009 A Foundation Course in Human Values and professional Ethics.
2. Prof.KV Subba Raju, 2013, Success secrets for Engineering students , Smart student Publications,3rd Edition.

REFERENCE BOOKS

1. Ivan Ilich,1974, Energy & Equity, The Trinity press, Worcester and Harpercollins, USA.
2. E.F.Schumacher, 1973, small is Beautiful: a study of economics as if people mattered, Blond & Briggs,Britain.

3. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya path Sansathan Amarkantak.
4. Sussan George, 1976, How the other Half Dies, Penguin press Reprinted 1986,1991.
5. PL Dhar, RR Gaur,1990 Science and Humanism Commonwealth Publishers.
6. A.N.Tripathy,2003, Human Values, New Age International Publishers
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H.Meadows,Dennis L. Meadows, Jorgen Randers, Willian A. Behrens III, 1972, Limits to Growth –Club of Rome’s report Universe Books.
9. E.G Seebauer & Robert L. Beery, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.
10. M Govindrajan , S Natrajan & V.S Senthil kuma, Engineering Ethichs (including Human Values), Eastern Economy Edition, prentice Hall of India Ltd.

Relevant CDs, Movies, Documentaries & other Literature:

1. Value Education website <http://www.uptu.ac.in>
2. Story of stuff, <http://www.storyofstuff.com>
3. Al Gore, An Inconvenient Truth, Paramount classics, USA
4. Charlie Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology-the Untold Story

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(R15A0503) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Objectives:

- To explain with examples the basic terminology of functions, relations, and sets.
- To perform the operations associated with sets, functions, and relations.
- To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
- To describe the importance and limitations of predicate logic.
- To relate the ideas of mathematical induction to recursion and recursively defined structures.
- To use Graph Theory for solving problems

UNIT-I

Mathematical Logic : Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers.
Predicates : Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT-II

Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties,
Algebraic structures : Algebraic systems Examples and general properties, Semigroups and monads, groups sub groups' homomorphism, Isomorphism.

UNIT-III

Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application.

UNIT-IV

Recurrence Relation : Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT-V

Graph Theory : Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs. Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

TEXT BOOKS:

1. Elements of DISCRETE MATHEMATICS- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.

2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.

REFERENCE BOOKS:

1. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition. TMH.
2. Discrete Mathematical structures Theory and application-Malik & Sen, Cengage.
3. Discrete Mathematics with Applications, Thomas Koshy, Elsevier.
4. Logic and Discrete Mathematics, Grass Man & Trembley, Pearson Education.

Outcomes:

- Ability to Illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
- Ability to Demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
- Ability to represent and Apply Graph theory in solving computer science problems.

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(R15A0504) DATA STRUCTURES USING C++

Objectives:

- To understand the basic concepts such as Abstract Data Types, Linear and Non-Linear Data structures.
- To understand the notations used to analyze the Performance of algorithms.
- To understand the behavior of data structures such as stacks, queues, trees, hash tables, search trees, Graphs and their representations.
- To choose the appropriate data structures for a specified application
- To write programs in C++ to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables, search trees.

UNIT I:

Searching: Linear and binary search methods.

Sorting: Bubble sort, selection sort, Insertion sort, Quick sort, Merge sort, Heap sort, Shell sort, Radix sort. Time complexities.

UNIT II:

Stacks, Queues, Circular queues, Dequeues working and representation using arrays, Applications of stacks :infix to post fix conversion, postfix expression evaluation.

UNIT III:

Linked list: Singly linked list, Doubly linked list, Circular linked list working and representation using pointers. Implementation of stacks and queues using pointers.

UNIT IV:

Trees: Terminology, sequential and linked representation, tree traversals. Binary trees, Binary search trees.

UNIT V:

Graphs: Terminology, sequential and linked representation, graph traversals : Depth First Search & Breadth First Search implementation. Spanning trees, Prims and Kruskals method.

TEXT BOOKS:

1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
2. Data Structures Using C – A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson education.

REFERENCES :

1. C Programming & Data structures – E. Balaguru Swami, TMH
2. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education
3. C Programming with problem solving, J.A. Jones & K. Harrow, dreamtech Press
Let us C – Yeswanth Kanithkar.

Outcomes:

- Learn how to use data structure concepts for realistic problems.
- Ability to identify appropriate data structure for solving computing problems in respective language.
- Ability to solve problems independently and think critically.

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(R15A0505) PRINCIPLES OF PROGRAMMING LANGUAGES

Objectives:

- To briefly describe various programming paradigms.
- To provide conceptual understanding of High level language design and implementation.
- To introduce the power of scripting languages.

UNIT I:

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. **Syntax and Semantics:** general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages feature,

UNIT II:

Parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT III:

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

Subprograms and Blocks: Fundamentals of sub-programs, Scope of life time of variables, static and dynamic scope, design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

UNIT IV:

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

UNIT V:

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

TEXT BOOKS:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech, rp-2007.

REFERENCE BOOKS:

1. Programming Languages, 2nd Edition, A. B. Tucker, R. E. Noonan, TMH.
2. Programming Languages, K. C. Loudon, 2nd Edition, Thomson, 2003.
3. LISP Patric Henry Winston and Paul Horn Pearson Education.
4. Programming in Prolog, W. F. Clocksin & C. S. Mellish, 5th Edition, Springer.

Outcomes:

- Ability to express syntax and semantics in formal notation.
- Ability to apply suitable programming paradigm for the application.
- Gain knowledge and comparison of the features programming languages.

(R15A0024) PROBABILITY AND STATISTICS

Objectives:

- Understand a random variable that describes randomness or an uncertainty in certain realistic situation. It can be either discrete or continuous type.
- In the discrete case, study of the binomial and the Poisson random variables and the normal random variable for the continuous case predominantly describe important probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
- Most of the random situations are described as functions of many single random variables. In this unit, the objective is to learn functions of many random variables, through joint distributions.
- The types of sampling, Sampling distribution of means, Sampling distribution of variance, Estimations of statistical parameters, Testing of hypothesis of few unknown statistical parameters.
- The mechanism of queuing system, The characteristics of queue, The mean arrival and service rates.
- The expected queue length, The waiting line
- The random processes, The classification of random processes, Markov chain, Classification of states
- Stochastic matrix (transition probability matrix), Limiting probabilities, Applications of Markov chains.

UNIT -1 : Introduction to Statistics & Probability

Introduction to Statistics

Measures of central tendency-Mean ,Median and Mode ,dispersion-Variance and Standard Deviation. Correlation -Coefficient of correlation , Rank correlation, Regression- Regression Coefficients , Lines of Regression.

probability - axioms of probability – some elementary theorems and Examples – conditional probability – Baye’s theorem.

UNIT -2 : Random Variables and Probability Distributions

Random Variables

Single and multiple Random variables -Discrete and Continuous. Probability distribution function, mass function and density function of probability distribution. mathematical expectation.

Probability distributions: Binomial distribution – properties, mean and variance, Poisson distribution – properties, mean and variance and Normal distribution – properties, mean and variance

UNIT -3 : Sampling Distributions and Statistical Inferences

Sampling: Definitions of population ,sampling ,statistic ,parameter-Types of sampling – Expected values of sample mean and variance,Standard error- Sampling distribution of means and variance

Parameter Estimations : likelihood estimate , interval estimate.

Testing of hypothesis: Null and Alternative hypothesis-Type I and Type II errors , Critical region – confidence interval – Level of significance,One tailed and Two tailed test

Large sample Tests: i) Test of significance of single mean and equality of means of two samples(cases of known and unknown variance whether equal or unequal)

ii) Tests of significance difference between sample proportion and population proportion and difference between two sample proportions

UNIT -4 : Exact Sampling Distributions(Small samples)

Exact Sampling Distributions(Small samples) Student t- distribution - properties

i)Test of significant difference between sample and population mean

ii)Test of difference between means of two small samples(independent and dependent samples)

F- distribution - properties –test of equality of two population variances

Chi-square distribution -properties –i)Test of goodness of fit

ii)Test of independence of attributes

UNIT-5

Queuing Theory and Stochastic process

Structure of a queuing system its characteristics-Arrival and service process-Pure Birth and Death process Terminology of queuing system -Queuing model and its types-M/M/1 model of infinite queue (without proofs)and M/M/1 model of finite queue (without proofs).

Stochastic Process

Introduction to stochastic process-classification and methods of description of Random process i.e,stationary and non-stationary Average values of single and two or more random process

Markov process, Markov chain, Examples of Markov chains, Stochastic matrix.

TEXT BOOKS:

1. Probability and Statistics by T.K..V Iyengar& B.Krishna Gandhi S.Ranganatham,MVSSAN Prasad. SCHAND Publishers
2. Fundamentals of Mathematical Statistics by SC Gupta and V.K. Kapoor.

REFERENCES :

1. Higher Engineering Mathematics By Dr.B.S.Grewal,Khanna Publishers

2. Probability and Statistics for Engineers and Scientists by Sheldon M.Ross,Academic Press.

Outcomes:

- Students would be able to identify distribution in certain realistic situation. It is mainly useful for circuit as well as non circuit branches of engineering. Also able to differentiate among many random variables involved in the probability models. It is quite useful for all branches of engineering.
- The student would be able to calculate mean and proportions(small and large samples)and to make important decisions from few samples which are taken out of unmanageably huge populations.It is mainly useful for non-branches of engineering.
- The student would be able to find the expected queue length, the ideal time the traffic intensity and the waiting time. these are very useful tools in many engineering and data management problems in the industry. it is useful for all branches of engineering.
- The student would able to understand about the random process, markov process and markov chains which are essentially models of many time dependent processes such as signals in communications, time series analysis, queuing systems. The student would be able to find the limiting probabilities and the probabilities in n^{th} state. It is quite useful for all branches of engineering.

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(R15A0401) ELECTRONIC DEVICES AND CIRCUITS**Objectives:**

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

- To familiarize the student with the principal of operation, analysis and design of junction diode, BJT and FET transistors and amplifier circuits.
- To understand diode as a rectifier.
- To study basic principal of filter of circuits and various types

UNIT-I

P-N Junction diode: Qualitative Theory of P-N Junction, P-N Junction as a diode, diode equation, volt-ampere characteristics, temperature dependence of V-I characteristic, ideal versus practical –resistance levels (static and dynamic), transition and diffusion capacitances, diode equivalent circuits, load line analysis, breakdown mechanisms in semiconductor diodes, zener diode characteristics.

Special purpose electronic devices: Principal of operation and Characteristics of Tunnel Diode with the help of energy band diagrams, Varactor Diode, SCR and photo diode

UNIT-II

RECTIFIERS, FILTERS: P-N Junction as a rectifier, Half wave rectifier, full wave rectifier, Bridge rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-section filter, π -section filter and comparison of various filter circuits, Voltage regulation using zener diode.

UNIT-III

BIPOLAR JUNCTION TRANSISTOR: The Junction transistor, Transistor current components, Transistor as an amplifier, Transistor construction, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations. α and β Parameters and the relation between them, BJT Specifications. BJT Hybrid Model, h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of transistor configurations in terms of A_i , R_i , A_v , and R_o ,

UNIT-IV

TRANSISTOR BIASING AND STABILISATION: Operating point, the D.C and A.C Load lines, Need for biasing, criteria for fixing, operating point, B.J.T biasing, Fixed bias, Collector to base bias, Self bias techniques for stabilization, Stabilization factors, (s , s^I , s^{II}), Bias Compensation using diode and transistor, (Compensation against variation in V_{BE} , I_{CO}) Thermal run away, Condition for Thermal stability.

UNIT-V**FIELD EFFECT TRANSISTOR AND FET AMPLIFIER**

JFET (Construction, principal of Operation and Volt –Ampere characteristics). Pinch-off voltage-Small signal model of JFET. FET as Voltage variable resistor, Comparison of BJT

and FET. MOSFET (Construction, principal of Operation and symbol), MOSFET characteristics in Enhancement and Depletion modes. **FET Amplifiers:** FET Common source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, FET biasing.

TEXT BOOKS:

1. Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGraw Hill.
2. Electronic Devices and Circuits Theory, Boylsted, Prentice Hall Publications.
3. Electronic Devices and Circuits, S.Salivahanan,N.Suresh kumar, McGraw Hill.
4. Electronic Devices and Circuits,Balbir kumar ,shail b.jain, PHI Privated Limited, Delhi.

REFERENCE BOOKS:

1. Electronic Devices and Circuits,K.Lal Kishore B.S Publications
2. Electronic Devices and Circuits, G.S.N. Raju, I.K. International Publications, New Delhi, 2006.
3. Electronic Devices and Circuits,A.P Godse, U.A Bakshi , Technical Publications
4. Electronic Devices and Circuits K.S. Srinivasan Anurdha Agencies

Outcomes:

- Understand and analyze the different types of diodes, operation and its characteristics
- Design and analyze the DC bias circuitry of BJT and FET
- Design biasing circuits using diodes and transistors
- To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices

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(R15A0461) DIGITAL LOGIC DESIGN**(Open Elective-I)****Objectives:**

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

UNIT I MINIMIZATION TECHNIQUES AND LOGIC GATES 12

Minimization Techniques: Boolean postulates and laws, De-Morgan's Theorem, Minimization of Boolean expressions Minterm – Maxterm - Sum of Products (SOP), Product of Sums (POS), Karnaugh map and Quine-McCluskey methods of minimization.

Logic Gates: AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive NOR Implementations of Logic Functions using gates, NAND-NOR implementations

UNIT II COMBINATIONAL CIRCUITS 12

Design procedure – Half adder, Full Adder, Half subtractor, Full subtractor, Parallel binary adder, parallel binary Subtractor, Carry Look Ahead adder, BCD adder, Binary Multiplier, Binary Divider, Multiplexer/Demultiplexer, decoder, encoder, parity checker, parity generators, Code converters, Magnitude Comparator.

UNIT III SEQUENTIAL CIRCUITS 12

Latches, Flip-flops, SR, JK, D, T, and Master-Slave, Characteristic table and equation, Application table, Edge triggering, Level Triggering, Realization of one flip flop using other flip flops, serial adder/subtractor, Asynchronous Ripple or serial counter, Asynchronous Up/Down counter - Synchronous counters, Synchronous Up/Down counters, Programmable counters, Design of Synchronous counters: state diagram, State table, State minimization, State assignment, Excitation table and Circuit implementation, Modulo-n counter, Registers: shift registers, Universal shift registers counters, sequence generators.

UNIT IV MEMORY DEVICES 12

Classification of memories – ROM : ROM organization, PROM, EPROM, EEPROM, RAM: RAM organization, Write operation, Read operation, Timing wave forms, Static RAM Cell: Bipolar RAM cell, MOSFET RAM cell, Dynamic RAM cell, Programmable Logic Devices : Programmable Logic Array (PLA) - Programmable Array Logic, Implementation of combinational logic circuits using ROM, PLA, PAL.

UNIT V SYNCHRONOUS AND ASYNCHRONOUS SEQUENTIAL CIRCUITS 12

Synchronous Sequential Circuits: General Model, Classification, Design, Use of Algorithmic State Machine, Analysis of Synchronous Sequential Circuits.

Asynchronous Sequential Circuits: Design of fundamental mode and pulse mode circuits , Incompletely specified State Machines, Problems in Asynchronous Circuits, Design of Hazard Free Switching circuits.

TEXT BOOKS

1. M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 / Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
2. S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, 3rd Edition., Vikas Publishing House Pvt. Ltd, New Delhi, 2006

REFERENCES

1. John F.Wakerly, Digital Design, Fourth Edition, Pearson/PHI, 2006
2. John.M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.
3. Charles H.Roth. Fundamentals of Logic Design, Thomson Learning, 2003.
4. Donald P.Leach and Albert Paul Malvino, Digital Principles and Applications, 6th Edition, TMH, 2003.
5. William H. Gothmann, Digital Electronics, 2nd Edition, PHI, 1982.
6. Thomas L. Floyd, Digital Fundamentals, 8th Edition, Pearson Education Inc, New Delhi, 2003
7. Donald D.Givone, Digital Principles and Design, TMH, 2003.

Outcomes:

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

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(R15A0419) DATA COMMUNICATION
(Open Elective-I)

Objectives:

Data communications and networking is the fastest growing technologies in our culture today. The course attempts to provide a unified overview of the broad field of data and computer communications. It emphasizes basic principles and topics of fundamental importance concerning the technology and architecture of this field and provides a detailed discussion of leading edge topics.

UNIT I:

INTRODUCTION TO DATA COMMUNICATIONS AND NETWORKING: Standards Organizations for Data Communications, Layered Network Architecture, Open Systems Interconnection, Data Communications Circuits, Serial and parallel Data Transmission, Data communications Circuit Arrangements, Data communications Networks, Alternate Protocol Suites.

SIGNALS, NOISE, MODULATION, AND DEMODULATION:

Signal Analysis, Electrical Noise and Signal-to-Noise Ratio, Analog Modulation Systems, Information Capacity, Bits, Bit Rate, Baud, and M-ary Encoding, Digital Modulation.

Unit II:

METALLIC CABLE TRANSMISSION MEDIA : Metallic Transmission Lines, Transverse Electromagnetic Waves, Characteristics of Electromagnetic Waves, Transmission Line Classifications, Metallic Transmission Line Types, Metallic Transmission Line Losses.

OPTICAL FIBER TRANSMISSION MEDIA : Advantages of Optical Fiber Cables, Disadvantages of Optical Fiber Cables, Electromagnetic spectrum, Optical Fiber Communications System Block Diagram, Optical Fiber construction, Propagation of Light Through an Optical fiber Cable, Optical Fiber Modes and Classifications, Losses in Optical Fiber Cables, Light sources, Light Detectors, Lasers.

DIGITAL TRANSMISSION : Pulse Modulation, Pulse code Modulation, Dynamic Range, Signal Voltage –to-Quantization Noise Voltage Ration, Companding, PCM Line Speed, Time-Division Multiplexing, Frequency- Division Multiplexing, Wavelength- Division Multiplexing

Unit III:

WIRELESS COMMUNICATIONS SYSTEMS: Electromagnetic Polarization, Rays and Wavefronts, Electromagnetic Radiation, wave Attenuation and Absorption, Microwave Communications Systems, Satellite Communications Systems.

TELEPHONE INSTRUMENTS AND SIGNALS: The Subscriber Loop, Standard Telephone Set, Basic Telephone Call Procedures, Cordless Telephones, Caller ID, Electronic Telephones, Paging systems.

THE TELEPHONE CIRCUIT: The Local Subscriber Loop, Units of Powers Measurement, Voice-Frequency Circuit Arrangements, Crosstalk.

CELLULAR TELEPHONE SYSTEMS:

First- Generation Analog Cellular Telephone, Personal communications system, Second-Generation Cellular Telephone Systems, N-AMPS, Digital Cellular Telephone, North American Cellular and PCS Summary, Global system for Mobile Communications, Personal Communications Satellite System.

Unit IV:

DATA COMMUNICATIONS CODES, ERROR CONTROL, AND DATA FORMATS:

Data Communications Character Codes, Bar Codes, Error Control, Error Detection, Error Correction, Character Synchronization.

Unit V:

DATA COMMUNICATIONS EQUIPMENT: Digital Service Unit and Channel Service Unit, Voice- Band Data Communication Modems, Bell Systems- Compatible Voice- Band Modems, Voice- Band Modem Block Diagram, Voice- Band Modem Classifications, Asynchronous Voice-Band Modems, Synchronous Voice-Band Modems, Modem Synchronization, Cable Modems, Probability of Error and Bit Error Rate.

DATA –LINK PROTOCOLS: Data –Link Protocol Functions, Character –and Bit- Oriented Protocols, Data Transmission Modes, Asynchronous Data – Link Protocols, Synchronous Data – Link Protocols, Synchronous Data – Link Control, High – Level Data – Link Control.

TEXT BOOKS:

1. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education.

Reference Books

2. Data Communications and Networking, Behrouz A Forouzan, Fourth Edition. TMH.
3. Computer Communications and Networking Technologies, Gallow, Second Edition Thomson
4. Computer Networking and Internet, Fred Halsll, Lingana Gouda Kulkarni, Fifth Edition, Pearson Education

Outcomes:

Upon completion of the subject, the student will be able to:

- Understand unified overview of the broad field of data and computer communications.
- Emphasizes basic principles and topics of fundamental importance concerning the technology Understand the architecture of this field
- Learn detailed discussion of leading edge topics.

II Year B.Tech. CSE - I Sem

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**(R15A0418) OPTICAL COMMUNICATION
(Open Elective-I)**

Objectives:

- To realize the significance of optical fiber communications.
- To understand the construction and characteristics of optical fiber cable.
- To develop the knowledge of optical signal sources and power launching.
- To identify and understand the operation of various optical detectors.
- To under the design of optical systems and WDM.

UNIT I

Overview of optical fiber communication - Historical development, The general system, advantages of optical fiber communications. Optical fiber wave guides- Introduction, Ray theory transmission, Total Internal Reflection, Acceptance angle, Numerical Aperture, Skew rays. Cylindrical fibers- Modes, Vnumber, Mode coupling, Step Index fibers, Graded Index fibers.

Single mode fibers- Cut off wavelength, Mode Field Diameter, Effective Refractive Index. [2]. Fiber materials — Glass, Halide, Active glass, Chalgenide glass, Plastic optical fibers.

UNIT II

Signal distortion in optical fibers- Attenuation, Absorption, Scattering and Bending losses, Core and Cladding losses. Information capacity determination, Group delay, Types of Dispersion - Material dispersion, Wave-guide dispersion, Polarization mode dispersion, Intermodal dispersion. Pulse broadening. Optical fiber Connectors- Connector types, Single mode fiber connectors, Connector return loss.

UNIT III

Fiber Splicing- Splicing techniques, Splicing single mode fibers. Fiber alignment and joint loss- Multimode fiber joints, single mode fiber joints,. Optical sources- LEDs, Structures, Materials, Quantum efficiency, Power, Modulation, Power bandwidth product. Injection Laser Diodes- Modes, Threshold conditions, External quantum efficiency, Laser diode rate equations, Resonant frequencies. Reliability of LED&ILD.

Source to fiber power launching - Output patterns, Power coupling, Power launching, Equilibrium Numerical Aperture, Laser diode to fiber coupling.

UNIT IV

Optical detectors- Physical principles of PIN and APD, Detector response time, Temperature effect on Avalanche gain, Comparison of Photodetectors. Optical receiver operation- Fundamental receiver operation, Digital signal transmission, error sources, Receiver configuration, Digital receiver performance, Probability of error, Quantum limit, Analog receivers.

UNIT V

Optical system design — Considerations, Component choice, Multiplexing. Point-to- point links, System considerations, Link power budget with examples. Overall fiber dispersion in Multi mode and Single mode fibers, Rise time budget with examples.

Transmission distance, Line coding in Optical links, WDM, Necessity , Principles, Types of WDM, Measurement of Attenuation and Dispersion, Eye pattern.

TEXT BOOKS :

1. Optical Fiber Communications – Gerd Keiser, Tata Mc Graw-Hill International edition, 4th Edition, 2008.
2. Optical Fiber Communications – John M. Senior, PHI, 2nd Edition, 2002.

RERFERENCES :

1. Fiber Optic Communications – D.K. Mynbaev , S.C. Gupta and Lowell L. Scheiner, Pearson Education, 2005.
2. Text Book on Optical Fibre Communication and its Applications – S.C.Gupta, PHI, 2005.
3. Fiber Optic Communication Systems – Govind P. Agarwal , John Wiley, 3rd Ediition, 2004.
4. Fiber Optic Communications – Joseph C. Palais, 4th Edition, Pearson Education, 2004.

Outcomes:

- At the end of the course the student will be able to:
- Understand and analyze the constructional parameters of optical fibers.
- Be able to design the optical system.
- Estimate the losses due to attenuation, absorption, scattering and bending.
- Compare various optical detectors and choose suitable one for different applications.

II Year B.Tech. CSE - I Sem

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(R15A0282) ELECTRICAL AND ELECTRONICS LAB

PART – A

1. Verification of KVL and KCL.
2. Verification of Superposition and Reciprocity theorems.
3. Verification of Maximum power transfer theorem.
4. Verification of Thevenin's and Norton's theorems.
5. OC and SC tests on single phase transformer.
6. Load test on single phase transformer.

PART – B

7. PN Junction diode characteristics.
8. Zener diode characteristics.
9. Half wave rectifier with and without filter.
10. Full wave rectifier with and without filter.
11. Transistor CB characteristics (Input and Output).
12. Transistor CE characteristics (Input and Output).

II Year B.Tech. CSE - I Sem

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(R15A0583) DATA STRUCTURES USING C++ LAB

Objectives:

- To write and execute programs in C++ to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.
- To write and execute write programs in C++ to implement various sorting and searching methods.

Week 1

Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:

i) Linear search ii) Binary search

Week 2

Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:

i) Bubble sort ii) Selection sort

Week 3

Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:

i) Insertion sort ii) Quick Sort

Week 4

Write C programs that implement stack (its operations) using

i) Arrays ii) Pointers

Week 5

Write C programs that implement Queue (its operations) using

i) Arrays ii) Pointers

Week6

Write a program to convert the given infix expression to post-fix expression.

Week7

Write a program to evaluate a post-fix expression.

Week8

Write C programs to implement the following using arrays

i) Circular queue ii) Dequeue

Week 9

Write a C program that uses functions to perform the following operations on singly linked list:

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 10

Write a C program that uses functions to perform the following operations on doubly linked list: i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways

Week11

Write a C program that uses functions to perform the following operations on circular linked list:

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 12

Write a C program that uses functions to perform the following:

- i) Creating a Binary Tree of integers
- ii) Traversing the above binary tree in preorder, in order and post order.

TEXT BOOKS

1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
2. Programming in C, P.Dey & M. Ghosh, Oxford Univ.Press.
3. C and Data Structures, E Balaguruswamy, TMH publications.

Outcomes:

- Ability to identify the appropriate data structure for given problem.
- Graduate able to design and analyze the time and space complexity of algorithm or program.
- Ability to effectively use compilers includes library functions, debuggers and trouble shooting.

II Year B. Tech. CSE – I Sem

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(R15A0004) FOREIGN LANGUAGE-FRENCH**Objectives:**

- To improve the basic speaking skills of the French language.
- To hone the basic sentence constructions in day to day expressions for communication in their work place.

UNIT-I:

Pronunciation guidelines; Single vowels, Vowels and consonants combinations,; Numbers and Genders; articles verbs and their groups; present tense; adjectives from singular to plural

UNIT-II

Sentences Structures; Prepositions, affirmatives, Negative and, Interrogative Sentences, The Family, Conversation, Notes on Vocabulary, Grammar, Liaisons and mechanisms.

UNIT-III

D'où viens-tu (Where do you come from); Vocabulary, Conversation, Notes on Vocabulary, Liaisons Guidelines. Comparer (Comparing); Vocabulary, Conversation, Liaisons, Ordinal Number up to 100. Grammar.

UNIT-IV

Le temps (Time); Vocabulary, Grammar; Vocabulary related to - The Family, Vocabulary - Some more grammar.

UNIT-IV

French Expressions and Idioms; Day-to-day Life, At Work, about Sports, Special Events Other French Flavours; country of wine, perfumes and landscapes; - Québec and Acadie, , pass time in Suisse, people of France.

REFERENCE BOOKS:

1. Le Nouveau Sans Frontiere-1, Cle International | 2003 |
2. Cahier d' activités ov Le Nouveau Sans Frontiere-1 Cle International | 2003 |
3. Easy French Step-by-step by Myrna Bell Rochester
4. Ultimate French Beginner-Intermediate (Coursebook) By Livid Language
5. L'Aventure: An Introduction to French Language and Francophone Cultures By Evelyne Charvier-Berman, Anne C. Cummings.

Outcomes

- The student will be in a position to speak in French, Which is the second most widely learned foreign language after English, and the ninth most widely spoken language in the world. French is also the only language, alongside English, that is taught in every country in the world.
- The Student will get the ability to speak French is an advantage on the international job market.
- Students with a good level of French are eligible for French government scholarships to enroll in postgraduate courses in France in any discipline and qualify for internationally recognized French degrees.

II Year B. Tech. CSE – I Sem

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(R15A0005) FOREIGN LANGUAGES: GERMAN

Objectives:

1. To familiarize the students with a modern foreign language.
2. To familiarize the students with the sounds of German and their symbols.
3. To familiarize students with German for basic communication and functions in everyday situations.
4. To familiarize students with the basic of writing simple, direct sentences and short compositions.

UNIT I

Current trends in German orthography, German grammar and lexical units, discourse models, oral and written.

UNIT- II

Communication patterns, prose passages, etc.

UNIT- III

Communication skills in everyday situations

UNIT-IV

Training in creative writing in German.

UNIT- V

Training in creative speaking in German.

TEXT BOOKS

Lernziel Deutsch

Reference books:

Themen

Tangram

Sprachkurs Deutsch

Schulz-Griesbach

Outcomes

1. Students familiarize with a modern foreign language – German
2. The students with German get acquainted for basic communication in everyday situations.

3. Students will know with the basics of writing simple direct sentences and short compositions.
4. Students get to know the basics of German language to communicate in the work place when they find the necessity.

II Year B. Tech. CSE – II Sem

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(R15A0506) Formal Languages and Automata Theory**Objectives:**

- To teach the student to identify different formal language classes and their relationships
- To teach the student the theoretical foundation for designing compilers.
- To teach the student to use the ability of applying logical skills.
- Teach the student to prove or disprove theorems in automata theory using its properties
- To teach the student the techniques for information processing.
- Understand the theory behind engineering applications.

UNIT I:

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, FA, transition diagrams and Language recognizers.

Finite Automata: Deterministic finite automaton, Non deterministic finite automaton and NFA with ϵ transitions - Significance, acceptance of languages.

Conversions and Equivalence : Equivalence between NFA with and without ϵ transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSMs, Finite Automata with output- Moore and Melay machines.

UNIT II:

Regular Languages: Regular sets, regular expressions, identity rules, Conversion finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (**proofs not required**).

UNIT III:

Grammar Formalism: Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.

Context Free Grammars: Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (**proofs omitted**).

UNIT IV:

Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. **(Proofs not required)**. Introduction to DCFL and DPDA.

UNIT V:

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required).

Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility, **Definition of P and NP problems, NP complete and NP hard problems.**

TEXT BOOKS:

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D. Pearson Education.
2. Introduction to Theory of Computation - Sipser 2nd edition Thomson

REFERENCE BOOKS:

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation ,John C Martin, TMH
3. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
4. Theory of Computer Science and Automata languages and computation -Mishra and Chandrashekar, 2nd edition, PHI.
5. Theory of Computation, By K.V.N. Sunitha and N.Kalyani

Outcomes:

Student will have the ability to

- Apply knowledge in designing or enhancing compilers.
- Design grammars and automata (recognizers) for different language classes.
- Apply knowledge in developing tools for language processing or text processing.
- Mapping real time systems to mathematical models.

II Year B. Tech. CSE – II Sem

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4 1/-/- 3**(R15A0507) JAVA PROGRAMMING****Objective:**

This subject aims to introduce students to the Java programming language. Upon successful completion of this subject, students should be able to create Java programs that leverage the object-oriented features of the Java language, such as encapsulation, inheritance and polymorphism; use data types, arrays and other data collections; implement error-handling techniques using exception handling, create and event-driven GUI using Swing components.

UNIT-I

OOP Concepts:- Data abstraction, encapsulation, inheritance, Benefits of Inheritance, Polymorphism, classes and objects, Procedural and object oriented programming paradigms.

Java Programming- History of Java, comments, Data types, Variables, Constants, Scope and Lifetime of variables, Operators, Operator Hierarchy, Expressions, Type conversion and casting, Enumerated types, Control flow- block scope, conditional statements, loops, break and continue statements, simple java stand alone programs, arrays, console input and output, formatting output, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and constructors, recursion, garbage collection, building strings, exploring string class.

UNIT – II

Inheritance – Inheritance hierarchies super and sub classes, Member access rules, super keyword, preventing inheritance: final classes and methods, the Object class and its methods.

Polymorphism – dynamic binding, method overriding, abstract classes and methods.

Interfaces- Interfaces Vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface.

Inner classes- Uses of inner classes, local inner classes, anonymous inner classes, static inner classes, examples.

Packages- Defining, creating and accessing a package, Understanding CLASSPATH, importing packages.

UNIT-III

Exception handling- Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception sub classes.

Multithreading – Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer pattern, Exploring java.net and java.text.

UNIT-IV

Collection Framework in Java – Introduction to java collections, Overview of java collection framework, Generics, Commonly used collection classes- Array List, Vector, Hash table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, Calendar and Properties.

Files- Streams- Byte streams, Character streams, Text input/output, Binary input/output, random access file operations, File management using File class.

Connecting to Database – JDBC Type 1 to 4 drivers, Connecting to a database, querying a database and processing the results, updating data with JDBC.

UNIT-V

GUI Programming with Java- The AWT class hierarchy, Introduction to Swing, Swing Vs AWT, Hierarchy for Swing components, Containers – JFrame, JApplet, JDialog, JPanel, Overview of some Swing components – JButton, JLabel, JTextField, JTextArea, simple Swing applications, Layout management – Layout manager types – border, grid and flow

Event Handling- Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Examples: Handling a button click, Handling Mouse events, Adapter classes.

Applets – Inheritance hierarchy for applets, differences between applets and applications, Life cycle of an applet, Passing parameters to applets, applet security issues.

TEXT BOOK:

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.

REFERENCE BOOKS:

1. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA (or) Java: How to Program , P.J.Deitel and H.M.Deitel, PHI
2. Object Oriented Programming through Java, P. Radha Krishna, Universities Press.
3. Thinking in Java, Bruce Eckel, PE
4. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.

Outcomes:

- An understanding of the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;
- A competence to design, write, compile, test and execute straightforward programs using a high level language;
- An appreciation of the principles of object oriented programming;

- An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- Demonstrate the ability to use simple data structures like arrays in a Java program.
- Be able to make use of members of classes found in the Java API (such as the Math class).
- Demonstrate the ability to employ various types of selection constructs in a Java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
- Able to develop applications using Applet, AWT, JDBC and Swings

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(R15A0508) DESIGN AND ANALYSIS OF ALGORITHMS

Objectives:

- To analyze performance of algorithms.
- To choose the appropriate data structure and algorithm design method for a specified application.
- To understand how the choice of data structures and algorithm design methods impacts the performance of programs.
- To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.
- Prerequisites (Subjects) Data structures, Mathematical foundations of computer science.

UNIT I:

Introduction: Algorithm, Psuedo code for expressing algorithms, Performance Analysis- Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

Divide and conquer: General method , applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT II:

Searching and Traversal Techniques: Efficient non - recursive binary tree traversal algorithm, Disjoint set operations, union and find algorithms, Spanning trees, Graph traversals - Breadth first search and Depth first search, AND / OR graphs, game trees, Connected Components, Bi - connected components. Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

UNIT III:

Greedy method: General method, applications - Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT IV:

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT V:

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NPComplete classes, Cook's theorem.

TEXT BOOKS :

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Foundations of Algorithm, 4th edition, R. Neapolitan and K. Naimipour, Jones and Bartlett Learning.
3. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, Pearson Education, 2008.

REFERENCES :

1. Computer Algorithms, Introduction to Design and Analysis, 3rd Edition, Sara Baase, Allen, Van, Gelder, Pearson Education.
2. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.
3. Fundamentals of Sequential and Parallel Algorithm, K. A. Berman and J. L. Paul, Cengage Learning.
4. Introduction to the Design and Analysis of Algorithms, A. Levitin, Pearson Education.
5. Introduction to Algorithms, 3rd Edition, T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, PHI Pvt. Ltd.
6. Design and Analysis of algorithm, Aho, Ullman and Hopcroft, Pearson Education, 2004.

Outcomes:

- Be able to analyze algorithms and improve the efficiency of algorithms.
- Apply different designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc. Ability to understand and estimate the performance of algorithm.

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(R15A0509) DATABASE MANAGEMENT SYSTEMS**Objectives:**

- To Understand the basic concepts and the applications of database systems
- To Master the basics of SQL and construct queries using SQL
- To understand the relational database design principles
- To become familiar with the basic issues of transaction processing and concurrency control
- To become familiar with database storage structures and access techniques

UNIT I:

Data base System Applications, Purpose of Database Systems, View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base Architecture – Storage Manager – the Query Processor

Data base design and ER diagrams – ER Model - Entities, Attributes and Entity sets – Relationships and Relationship sets – ER Design Issues – Concept Design – Conceptual Design for University Enterprise.

Introduction to the Relational Model – Structure – Database Schema, Keys – Schema Diagrams

UNIT II:

Relational Query Languages, Relational Operations.

Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus.

Overview of the SQL Query Language – Basic Structure of SQL Queries, Set Operations, Aggregate Functions – GROUPBY – HAVING, Nested Sub queries, Views, Triggers.

UNIT III:

Normalization – Introduction, Non loss decomposition and functional dependencies, First, Second, and third normal forms – dependency preservation, Boyee/Codd normal form.

Higher Normal Forms - Introduction, Multi-valued dependencies and Fourth normal form, Join dependencies and Fifth normal form

UNIT IV:

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation-Based Protocols – Multiple Granularity.

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems-Remote Backup systems.

UNIT V:

File organization:– File organization – various kinds of indexes. Query Processing – Measures of query cost - Selection operation – Projection operation, - Join operation – set operation and aggregate operation – Relational Query Optimization – Transacting SQL queries – Estimating the cost – Equivalence Rules.

TEXT BOOKS:

1. Data base System Concepts, Silberschatz, Korth, McGraw hill, Sixth Edition.(All UNITS except III th)
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition.

REFERENCE BOOKS:

1. Fundamentals of Database Systems, Elmasri Navathe Pearson Education.
2. An Introduction to Database systems, C.J. Date, A.Kannan, S.Swami Nadhan, Pearson, Eight Edition for UNIT III.

Outcomes:

- Demonstrate the basic elements of a relational database management system
- Ability to identify the data models for relevant problems
- Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data
- Apply normalization for the development of application software's

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(R15A0410) COMPUTER ORGANIZATION**Objectives:**

- To understand basic components of system
- To explore the memory organization
- To explore I/O organization in depth
- Ability to analyze the hardware and software issues related to computers and the interface between the two.

UNIT I :

BASIC STRUCTURE OF COMPUTERS : Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes.

REGISTER TRANSFER LANGUAGE AND MICRO OPERATIONS : Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

UNIT-II:**Basic Computer Organization and Design:**

Instruction codes. Computer Registers Computer instructions, Timing and Control, Instruction cycle. Memory Reference Instructions, Input – Output and Interrupt, Complete Computer Description.

Micro Programmed Control: Control memory, Address sequencing, micro program example, design of control unit, micro Programmed control

UNIT-III:

Computer Processing Unit Organization: General Register Organization ,STACK organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation ,Program Control. CISC and RISC. **Computer Arithmetic:** Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. BCD Adder

UNIT-IV:

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP)

Pipeline And Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Dependencies, Vector Processing.

UNIT-V:

Memory Organization: Memory Hierarchy, Main Memory –RAM And ROM Chips, Memory Address map, Auxiliary memory-magnetic Disks, Magnetic tapes, Associate Memory,- Hardware Organization, Match Logic, Cache Memory –Associative Mapping , Direct Mapping, Set associative mapping ,Writing in to cache and cache Initialization , Cache

Coherence ,Virtual memory-Address Space and memory Space ,Address mapping using pages, Associative memory page table ,page Replacement .

TEXT BOOKS :

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Systems Architecture – M.Moris Mano, Illrd Edition, Pearson/PHI

REFERENCES :

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition.
4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

Outcomes:

Upon completion of this course, students should be able to:

- Student will learn the concepts of computer organization for several engineering applications.
- Student will develop the ability and confidence to use the fundamentals of computer organization as a tool in the engineering of digital systems.
- An ability to identify, formulate, and solve hardware and software computer engineering problems using sound computer engineering principles

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(R15A0061) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Open Elective-II)

Objectives:

- To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business operations that are needed for sound economic decision making.
- The main purpose is to provide inputs on an overall analysis of an individual firm namely: demand and supply, production function, cost analysis, markets etc.
- To understand and analyse the financial formats of the organisation for smooth running of the business.

Unit-I

Introduction to Managerial Economics: Definition, Nature and scope of Managerial economics, Micro and Macroeconomic concepts.

Demand Analysis: Demand Determinants, Law of Demand and exceptions. Elasticity Of Demand: Definition, Types, Measurement and Significance of elasticity of Demand. Demand Forecasting, Factors governing demand Forecasting, methods of demand Forecasting.

Unit-II

Production & Cost Analysis: Production Function- Isocost and Isoquants MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

Unit-III

Markets & New Economic Environment: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Objectives and Policies of Pricing- Methods of Pricing.

Business: Features of different forms of Business Organisation, Changing Business Environment in Post-liberalization scenario.

Unit-IV

Introduction to Capital and Financial Accounting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance – Trading forecast, Capital Budget, Cash Budget.

Accounting Definition, Concepts and Conventions (GAAP); Formats for preparation of Trial Balance and Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet).

Unit-V

Investment Decision: Features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems). **Financial Analysis:** Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios.

TEXTBOOKS:

1. Varshney & Maheswari, Managerial Economics, Sultan Chand, 2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age International Publishers, Hyderabad 2013
3. M. Kasi Reddy & Sarawathi, Managerial Economics and Financial Analysis, PHI, New Delhi, 2010.

REFERENCES:

1. S.N.Maheswari & S. K. Maheswari, Financial Accounting, Vikas, 2012.
2. D.N. Dwivedi, Managerial Economics, Vikas, 2012.
3. Justin Paul, Leena, Sebastian, Managerial Economics, Cengage, 2012
4. A,R.Aryasri: Managerial Economics and Financial Analysis, McGraw-Hill, 2011.

Outcomes:

Students should be able to understand the basic economic principles, forecast demand and supply and should be able to estimate cost and understand market structure, pricing practices and able to interpret the financial results of the organisation.

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**(R15A0062) SUPPLY CHAIN MANAGEMENT
(Open Elective-II)**

Objectives:

- To introduce the major building blocks, major functions, major business processes, performance metrics, and major decisions (strategic, tactical, and operational) in supply chain networks.
- To provide an insight into the role of Internet Technologies and technical aspects of key ITEC components in supply chain management.

Unit-I

Understanding the Supply Chain: What is supply chain; objectives and importance of supply chain; decision phases in supply chain; process views of s supply chain; examples of supply chain.

Unit-II

Designing Distribution Networks: The role of distribution in the supply chain; factors influencing distribution network design; design options for distribution network; e-business and the distribution network; distribution channels for FMCG sector, commodities, and agricultural produce; factors influencing network design decisions; models for facility location and capacity allocation.

Unit-III

Demand Forecasting And Aggregate Planning: Methods and Characteristics of demand forecasting; forecasting in practice; the role of aggregate planning in SCM; aggregate planning strategies; aggregate planning using linear programming; the role of IT in aggregate planning; implementing aggregate planning in practice.

Unit-IV

Managing Inventories in Supply chains: Cycle inventory; estimating cycle inventory cost; economies of scale to exploit fixed costs and quantity discounts; short term discounting; trade promotions; safety inventory in supply chain and uncertainties; the role of IT in inventory management; estimating and managing safety inventory in practice. Nature of global supply chain management.

Unit-V

Transportation and Sourcing in SCM: Role of transportation in SCM; transportation infrastructure and policies; design options for transportation network and trade-offs; tailored transportation system; risk management; transportation decisions in practice; Sourcing in SCM: in-house or outsource; third and fourth party logistics; contracts, risk sharing and supply chain performance; vendor analysis; the procurement process. Lack of coordination and the Bullwhip Effect; obstacles to coordination in a supply chain; building strategic partnership and trust within a supply chain.

TEXTBOOK:

1. Chopra, S, and P. Meindl, 2010, Supply Chain Management - Strategy, Planning and Operation, 4th Edition, Pearson Education Inc.

REFERENCES:

1. Raghuram, G. and N. Rangaraj, Logistics and Supply Chain Management: Cases and Concepts, Macmillan, New Delhi
2. Simchi-Levi, D., P. Kaminski and E. Simchi-Levi, 2003, Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies, 2nd Edition, Irwin, McGraw-Hill.
3. Shapiro, J., 2001, Modelling the Supply Chain, Duxbury Thomson Learning.

Outcomes:

Student will get awareness how to obtain customer sophistication, increasing network fragmentation, and fast-paced globalisation, the primary role of supply chain management, along with the coordination of material, information and cash flows, has become complex.

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**(R15A0063) KNOWLEDGE MANAGEMENT
(Open Elective-II)**

Objectives:

- The objective of the course is to provide the basics of the emerging area of Knowledge Management to students.
- It throws light on few important concepts as Knowledge management, Information Technology and Knowledge process, etc

Unit-I

The Knowledge Economy: Leveraging Knowledge, Data-Information knowledge-Wisdom relationship, organizational knowledge, characteristics and components of organizational knowledge –Building knowledge societies- Measures for meeting the challenges of implementing KM programmes.

Unit-II

Knowledge Management and Information Technology: Role Information Technology in Knowledge Management Systems, Knowledge Management tools, Creative effective Knowledge Management Systems through Information Technology, ERP and BPR, Data Warehousing and Data Mining.

Unit-III

Future of Knowledge Management and Industry perspective: Companies on the road to knowledge management, Knowledge Management in Manufacturing and service industry, challenges and future of Knowledge Management.

Unit-IV

The Knowledge Process: Universal appeal, Stages of KM Process, Knowledge Capital vs. physical capital, Customer Relationship Management, Business Ethics And KM, The Promise of Internet and the Imperatives of the new age.

Unit-V

Implementation of Knowledge Management: Discussion on Roadblocks to success, Ten-step KM Road Map of Amrit Tiwana, Business Intelligence and Internet platforms, web Portals, Information Architecture: A three-way Balancing Act, KM, the Indian experience, Net Banking in India. –Role of knowledge Management in Organisational Restructuring. The Mystique of a Learning Organisation.

TEXTBOOKS:

1. Mattison: Web Warehousing & Knowledge Management, Tata McGraw- Hill, 2009
2. B.Rathan Reddy: Knowledge management, Himalaya, 2009
3. Tapan K Panda: Knowledge Management, Excel, 2009.

REFERENCES:

1. Becerra Fernandez: Knowledge management: An Evolutionary view, PHI, 2009
2. Tiwana: The Knowledge Management tool kit, 2/e, Pearson Education, 2009
3. Warier: Knowledge Management, Vikas Publishing House, 2009

Outcomes:

- To Capture Knowledge - This goal can be achieved by creating KM repositories. Those will consist of structured documents with Knowledge embedded in them - memos, reports, presentations, and articles - stored in a way that they may be easily retrieved.

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(R15A0584) DATABASE MANAGEMENT SYSTEMS LAB**Objectives:**

Students will have the ability to:

- Keep abreast of current developments to continue their own professional development.
- To engage themselves in lifelong learning of Database management systems theories and technologies this enables them to pursue higher studies.
- To interact professionally with colleagues or clients located abroad and the ability to overcome challenges that arises from geographic distance, cultural differences, and multiple languages in the context of computing.
- Develop team spirit, effective work habits, and professional attitude in written and oral forms, towards the development of database applications

A. Practice on SQL Queries to acquire knowledge on RDBMS.**B. Case Study:**

Objective: This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database - "Roadway Travels". Students are expected to use "Mysql" database.

Roadway Travels: "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations
- **Reservations & Cancellation:**

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above Process involves many steps like 1. Analyzing the problem and identifying the Entities and Relationships, 2. E-R Model, 3. Relational Model 4. Normalization 5. Creating the database 6. Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys,

partial keys, if any.

Example:

Entities:

1. B U S
2. Ticket
3. Passenger

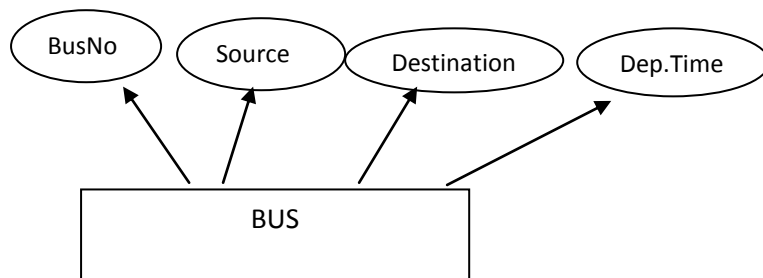
Relationships:

1. Reservation
2. Cancellation

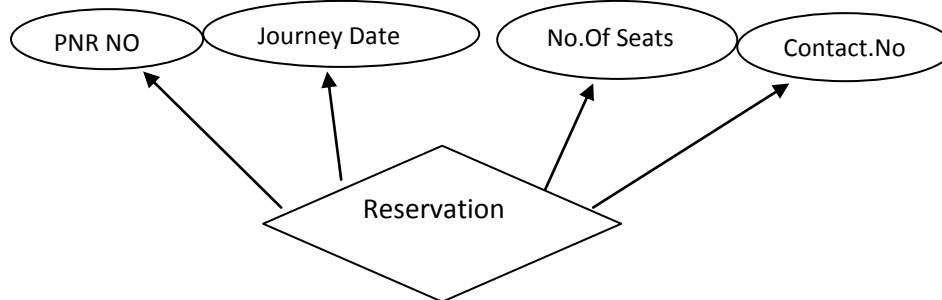
PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus_NO (Bus Entity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.



Ex: Bus Entity



Ex: Reservation relationship

Note: The student is required to submit a document by writing the Entities and Keys to the lab teacher

Experiment 2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total/partial). Try to incorporate Generalization, Aggregation, Specialization etc wherever required.

Note: The student is required to submit a document by drawing the E-R diagram to the lab teacher.

Experiment 3: Relational Model

Represent all the entities (Strong ,Weak) in tabular fashion.

Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attribute as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued and Derived) have different way of Representation.

Example: The passenger looks as below .This is an example.

You can add more attributes based on your E-R-Model

This is not normalized table.

Passenger

Name	Age	Sex	Address	Ticket_id	<u>Passport ID</u>
------	-----	-----	---------	-----------	--------------------

Note: The student is required to submit a document by represent relationships in a tabular fashion to the lab teacher.

Experiment 4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shown below.

Passenger

Name	Age	Sex	Address	<u>Passport ID</u>
------	-----	-----	---------	--------------------

Passport_id	Ticket_id
-------------	-----------

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

Experiment 5: Installation of Mysql and practicing DDL, commands

Installation of MySQL. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.

```
CREATE TABLE Passenger (  
Passport_id INTEGER PRIMARY KEY,  
  
Name VARCHAR (50) Not NULL,  
Age Integer Not NULL,  
Sex Char,  
Address VARCHAR (50) Not NULL);
```

Similarly create all other tables.

Note: Detailed creation of tables is given at the end.

Experiment 6: Practicing DML commands

DML commands are used to for managing data within schema objects.

Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for

The records remain

Inserting values into "Bus" table:

```
Insert into Bus values(1234,'hyderabad', 'tirupathi');  
Insert into Bus values (2345,'hyderabd' 'Banglore');  
Insert into Bus values (23,'hyderabd','Kolkata');  
Insert into Bus values (45,'Tirupathi','Banglore');  
Insert into Bus values (34,'hyderabd','Chennai');
```

Inserting values into "Passenger" table:

```
Insert into Passenger values (1, 45,'ramesh', 45,'M', 'abc123');  
Insert into Passenger values (2, 78,'geetha', 36,'F','abc124');  
Insert into Passenger values (45, 90,' ram', 30,'M','abc12');  
Insert into Passenger values (67, 89,' ravi', 50,'M','abc14');  
Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');
```

Few more Examples of DML commands:

```
Select * from Bus; (selects all the attributes and display)
```

```
UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;
```

Experiment 7: Querying

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

Display unique PNR_no of all Passengers.

Display all the names of male passengers.

Display the ticket numbers and names of all the passengers.

Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'.

Find the names of passengers whose age is between 30 and 45.

Display all the passengers names beginning with 'A'

Display the sorted list of passengers names

Experiment 8 and Experiment 9: Querying (continued...)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Write a Query to display the Information present in the Passenger and cancellation tables.
Hint: Use UNION Operator.

Display the number of days in a week on which the 9W01 bus is available.

Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR_No.

Find the distinct PNR numbers that are present.

Find the number of tickets booked by a passenger where the number of seats is greater than 1. Hint: Use GROUP BY, WHERE and HAVING CLAUSES.

Find the total number of cancelled seats.

Experiment 10: Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

**Eg: CREATE TRIGGER updcheck BEFORE UPDATE ON passenger
FOR EACH ROW BEGIN**

```
IF NEW.Tickent NO > 60 THEN SET New.Tickent no = Ticket no;  
ELSE  
SET New.Ticket no = 0;  
END IF;  
END;
```

Experiment 11: Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg: CREATE PROCEDURE myProc()

```
BEGIN
SELECT COUNT(Tickets) FROM Ticket WHERE age>=40;
End;
```

Experiment 12: Cursors

In this week you need to do the following: Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

```
CREATE PROCEDURE myProc (in_customer_id INT) B E G I N

DECLARE v_id INT;
DECLARE v_name VARCHAR(30);
DECLARE cl CURSOR FOR SELECT ppno,name FROM Passenger WHERE
ppno=in_customer_id;
OPEN cl;
FETCH cl into v_id, v_name;
Close cl;
END;
```

Tables**BUS**

Bus No: Varchar: PK (Primary key)
Source: Varchar
Destination: Varchar
DeptTime:Varchar

Passenger

PPNO: Varchar(15)) : PK
Name: Varchar(15)
Age : int (4)
Sex:Char(1 0) : Male/Female
Address: VarChar(20)

Passenger_Tickets

PPNO: Varchar(15)) : FK Ticket No: Numeric (9)

Reservation

PNR_No: Numeric(9) : PK
Journey_date : datetime(8)
No_of_seats : int (8)
Address: Varchar (50)
Contact_No: Numeric (9) —> Should not be less than 9 and Should not accept any other character other than Integer
Status: Char (2) : Yes / No

Cancellation

PNR_No:Numeric(9): FK

Journey_date: datetime (8)

No_of_seats : int (8)

Address : Varchar (50)

Contact_No: Numeric (9) —> Should not be less than 9 and should not accept any other character other than Integer

Status: Char (2) : Yes / No

Ticket

Ticket_No: Numeric(9): PK

Journey_date : datetime(8)

Age : int (4)

Sex:Char(10) : Male/Female

Source : Varchar

Destination : Varchar

Dep_time : Varchar

Reference Books:

1. Introduction to SQL,Rick F.Vander Lans,Pearson education..
2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova,Pearson education.
3. Oracle PL/SQL Programming,Steven Feuerstein,SPD.
4. SQL & PL/SQL for Oracle 10g,B lack Book, Dr.P.S.Deshpande, Dream Tech.
5. Oracle Database 11g PL/SQL Programming,M.Mc Laughlin,TMH.
6. SQL Fundamentals, J.J.Patrick,Pearson Education.

Outcomes:

Students will be able to demonstrate their skills

- In drawing the ER, EER, and UML Diagrams.
- In analyzing the business requirements and producing a viable model for the implementation of the database.
- In converting the entity-relationship diagrams into relational tables.
- To develop appropriate Databases to a given problem that integrates ethical, social, legal, and economic concerns.

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(R15A0585) JAVA PROGRAMMING LAB**Objectives:**

- To prepare students to become familiar with the Standard Java technologies of J2SE
- To prepare students to excel in Object Oriented programming and to succeed as a Java Developer through global rigorous education.
- To provide Students with a solid foundation in OOP fundamentals required to solve programming problems and also to learn Advanced Java topics like J2ME, J2EE, JSP, JavaScript
- To train Students with good OOP programming breadth so as to comprehend, analyze, design and create novel products and solutions for the real life problems.
- To inculcate in students professional and ethical attitude, multidisciplinary approach and an ability to relate java programming issues to broader application context.
- To provide student with an academic environment aware of excellence, written ethical codes and guidelines and lifelong learning needed for a successful professional career.

Week 1

a)write a java program that prompts the user for an integer and then printouts all prime numbers up to that integer.

b)write a java program to multiply two given matrices.

Use Eclipse or Net bean Platform and acquaint with the various menus. Create a test project, and a test class and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.

Week 2

Write a java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +,-,*,% operations. Add a text field to display the result. Handle any possible exceptions like divided by zero.

Week 3

a) Develop an applet in java that displays a simple message.

b) Develop an applet in Java that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" is clicked.

Week 4

Write a java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the result field when the Divide button is clicked. If Num1 and Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were zero, the program would throw an arithmetic Exception. Display the exception in a message dialog box.

Week 5

Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of the cube of the number.

Week 6

Write a java program that connects to a database using JDBC and does add,delete, modify and retrieve operations.

Week 7

Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow or green with radio buttons. On selecting a button, an appropriate message with "Stop", "Ready" or "Go" should appear above the buttons in selected color. Initially there is no message shown.

Week 8

Write a java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method printArea() that prints the area of the given shape.

Week 9

a) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Labels in Grid Layout.

b) Write a java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired. (Use Adapter classes).

Week 10

Write a Java Program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab(\t). It takes a name or phone number as input and prints the corresponding other value from the hash table. (hint: Use hash tables).

Week 11

a) Implement the above program with database instead of a text file.

b) Write program how to handle mouse and keyboard events?

Week 12

a) write a program to draw the components using Layout Manager?

- b) Write a Java program that takes tab separated data (one record per line) from a text file and inserts them into a database
- c) Write a Java Program that prints the meta-data of a given table.

TEXT BOOK:

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
2. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA (or) Java: How to Program , P.J.Deitel and H.M.Deitel, PHI

REFERENCE BOOKS:

1. Object Oriented programming through Java, P. Radha Krishna, Universities Press.
2. Thinking in Java, Bruce Eckel, PE
3. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.

Outcomes:

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

- Able to analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fundamental concepts in OOP.
- Demonstrate an ability to design and develop java programs, analyze, and interpret object oriented data and report results.
- Demonstrate an ability to design an object oriented system, AWT components or multithreaded process as per needs and specifications.
- Demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks like console and windows applications both for standalone and Applets programs

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(R15A0006) GENDER SENSITIZATION

(An Activity-based Course)

Objectives:

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Unit-I:

UNDERSTANDING GENDER:

Gender: Why Should We Study It? (*Towards a World of Equals: Unit -1*)

Socialization: Making Women, Making Men (*Towards a World of Equals: Unit -2*)

Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities. Just Relationships: Being Together as Equals (*Towards a World of Equals: Unit -12*)

Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Further Reading: Rosa Parks-The Brave Heart.

Unit — II:

GENDER AND BIOLOGY:

Missing Women: Sex Selection and Its Consequences (*Towards a World of Equals: Unit -4*) Declining Sex Ratio. Demographic Consequences.

Gender Spectrum: Beyond the Binary (*Towards a World of Equals: Unit -10*)

Two or Many? Struggles with Discrimination.

Additional Reading: Our Bodies, Our Health (*Towards a World of Equals: Unit -13*)

Unit — III:

GENDER AND LABOUR:

Housework: the Invisible Labour (*Towards a World of Equals: Unit -3*)

"My Mother doesn't Work." "Share the Load."

Women's Work: Its Politics and Economics (*Towards a World of Equals: Unit -7*)

Fact and Fiction. Unrecognized and Unaccounted work. Further Reading: Wages and Conditions of Work.

Unit — IV:

ISSUES OF VIOLENCE:

Sexual Harassment: Say No! (*Towards a World of Equals: Unit -6*)

Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: "Chupulu". Domestic Violence: Speaking Out (*Towards a World of Equals*: Unit -8)
Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Further Reading: New Forums for Justice. Thinking about Sexual Violence (*Towards a World of Equals*: Unit -11)
Blaming the Victim-"I Fought for my Life...." - Further Reading: The Caste Face of Violence.

Unit –V:

GENDER STUDIES:

Knowledge: Through the Lens of Gender (*Towards a World of Equals*: Unit -5)

Point of View. Gender and the Structure of Knowledge. Further Reading: Unacknowledged Women Artists of Telangana.

Whose History? Questions for Historians and Others (*Towards a World of Equals*: Unit -9)

Reclaiming a Past. Writing other Histories. Further Reading: Missing Pages from Modern Telangana History.

Essential Reading: All the Units in the Textbook, "*Towards a World of Equals: A Bilingual Textbook on Gender*" written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field.

REFERENCE BOOKS:

1. Sen, Amartya. More than One Million Women are Missing." New York Review of Books 37.20 (20 December 1990). Print. *'We Were Making History.... Life Stories of Women in the Telangana People's Struggle*. New Delhi: Kali for Women, 1989.
2. Tripti Lahiri. "By the Numbers: Where Indian Women Work." *Women's Studies Journal* (14 November 2012) Available online at: <http://blogs.wsj.com/India/real-time/2012/11/14/by-the-numbers-where-indian-women-work/>>
3. K. Satyanarayana and Susie Tharu (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2: Telugu And Kannada <http://harpercollins.co.in/BookDetail.asp?BookCode=3732>
4. Vimala. "Vantillu (The Kitchen)". *Women Writing in India: 600 BC to the Present. Volume II: The 20th Century*. Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 599-601.
5. Shatrughna, Veena et al. *Women's Work and its Impact on Child Health and Nutrition*, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research. 1993.
6. Stree Shakti Sanghatana. *'We Were Making History' Life Stories of Women in the Telangana People's Struggle*. New Delhi: Kali for Women, 1989.
7. Menon, Nivedita. *Seeing like a Feminist*. New Delhi: Zubaan-Penguin Books, 2012

8. Jayaprabha, A. "Chupulu (Stares)". *Women Writing in India: 6008C to the Present. Volume II: The 20th Century* Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 596-597.
9. Javeed, Shayan and Anupam Manuhaar. Women and Wage Discrimination in India: A Critical Analysis." *International Journal of Humanities and Social Science Invention* 2.4(2013)
10. Gautam, Liela and Gita Ramaswamy. "A 'conversation' between a Daughter and a Mother." *Broadsheet on Contemporary Politics. Special Issue on Sexuality and Harassment: Gender Politics on Campus Today*. Ed. Madhumeeta Sinha and Asma Rasheed. Hyderabad: Anveshi Research Center for Women's Studies, 2014.
11. Abdulali Sohaila. "I Fought For MyLife...and Won." Available online at: <http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdul/>
12. Jeganathan Pradeep, Partha Chatterjee (Ed). "Community, Gender and Violence Subaltern Studies XI Permanent Black and Ravi Dayal Publishers, New Delhi, 2000
13. K. Kapadia. *The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India*. London: Zed Books, 2002
14. S. Benhabib. *Situating the Self: Gender, Community, and Postmodernism in Contemporary Ethics*, London: Routledge, 1992
15. Virginia Woolf. *A Room of One's Own*. Oxford: Black Swan. 1992.
16. T. Banuri and M. Mahmood, *Just Development: Beyond Adjustment with a Human Face*, Karachi: Oxford University Press, 1997

Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

III Year B. Tech. CSE – I Sem

L T/P/D C

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(R15A0511) SOFTWARE ENGINEERING**Objectives:**

- To understand software process models such as waterfall and evolutionary models.
- To understand software requirements and SRS document.
- To understand different software design and architectural styles.
- To understand software testing approaches such as unit testing and integration testing.
- To understand quality control and how to ensure good quality software through quality assurance.

UNIT - I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

UNIT - II:

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT - III:

Design Engineering: Design process and Design quality, Design concepts, the design model.

Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design.

Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT - IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Metrics for Process and Products: Software Measurement, Metrics for software quality.

Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

UNIT - V:

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS :

1. Software Engineering A practitioner's Approach, Roger S Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering, Ian Sommerville, 7th edition, Pearson education.

REFERENCE BOOKS :

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering1: Abstraction and modelling, Diner Bjorner, Springer International edition, 2006.
6. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.
7. Software Engineering Foundations, Yingux Wang, Auerbach Publications, 2008.
8. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
9. Software Engineering3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.
10. Introduction to Software Engineering, R. J. Leach, CRC Press.

Outcomes:

- Ability to identify the minimum requirements for the development of application.
- Ability to develop, maintain, efficient, reliable and cost effective software solutions.
- Ability to critically thinking and evaluate assumptions and arguments.

III Year B.Tech-CSE I – Sem

L T/P/D C

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(R15A0512) COMPILER DESIGN**Objectives:**

- To provide an initial Understanding of language translators, Knowledge of various techniques used in compiler construction and also use of the automated tools available in compilers construction.

UNIT – I:

Language Translation: Basics, Necessity, Steps involved in atypical language processing system, Types of translators, **Compilers:** Overview and Phases of a Compiler, Pass and Phases of translation, bootstrapping, data structures in compilation

Lexical Analysis (Scanning): Functions of Lexical Analyzer, **Specification of tokens:** Regular expressions and Regular grammars for common PL constructs. **Recognition of Tokens:** Finite Automata in recognition and generation of tokens. **Scanner generators:** LEX-Lexical Analyzer Generators. **Syntax Analysis (Parsing) :** Functions of a parser, Classification of parsers. Context free grammars in syntax specification, benefits and usage in compilers.

UNIT – II:

Top down parsing –Definition, types of top down parsers: Backtracking, Recursive descent, Predictive, LL (1), Preprocessing the grammars to be used in top down parsing, Error recovery, and Limitations. **Bottom up parsing:** Definition, types of bottom up parsing, Handle pruning. Shift Reduce parsing, **LR parsers:** LR(0), SLR, CALR and LALR parsing, Error recovery, Handling ambiguous grammar, **Parser generators:** YACC-yet another compiler.

UNIT – III:

Semantic analysis: Attributed grammars, Syntax directed definition and Translation schemes, Type checker: functions, type expressions, type systems, types of checking of various constructs. **Intermediate Code Generation:** Functions, different intermediate code forms- syntax tree, DAG, Polish notation, and Three address codes. Translation of different source language constructs into intermediate code.

Symbol Tables: Definition, contents, and formats to represent names in a Symbol table. Different approaches used in the symbol table implementation for block structured and non block structured languages, such as Linear Lists, Self Organized Lists, and Binary trees, Hashing based STs.

UNIT – IV:

Runtime Environment: Introduction, Activation Trees, Activation Records, Control stacks. Runtime storage organization: Static, Stack and Heap storage allocation. Storage allocation for arrays, strings, and records etc.

Code optimization: goals and Considerations for Optimization, Scope of Optimization: Local optimizations, DAGs, Loop optimization, Global Optimizations. Common optimization techniques: Folding, Copy propagation, Common Sub expression eliminations, Code motion, Frequency reduction, Strength reduction etc.

UNIT – V:

Control flow and Data flow analysis: Flow graphs, Data flow equations, global optimization: Redundant sub expression elimination, Induction variable eliminations, Live Variable analysis. **Object code generation:** Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

TEXT BOOKS:

1. Compilers, Principle, Techniques, and Tools. – Alfred.V Aho, Monica S.Lam, Ravi Sethi, Jeffrey D. Ullman ; 2nd Edition, Pearson Education.
2. Modern Compiler implementation in C , - Andrew N.Appel Cambridge University Press.

REFERENCES:

1. **lex & yacc** , -John R Levine, Tony Mason, Doug Brown; O’reilly.
2. **Compiler Construction**, - LOUDEN, Thomson.
3. Engineering a compiler – Cooper & Linda, Elsevier
4. Modern Compiler Design – Dick Grune, Henry E.Bal, Cariel TH Jacobs, Wiley Dreatech

Outcomes: By the end of the semester, the student will be able to:

- Understand the necessity and types of different language translators in use.
- Apply the techniques and design different components (phases) of a compiler by hand.
- Solve problems, Write Algorithms, Programs and test them for the results.
- Use the tools Lex, Yacc in compiler construction.

III Year B.Tech. CSE - I Sem

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(R15A0513) OPERATING SYSTEMS

Objectives:

- To understand main components of OS and their working
- To study the operations performed by OS as a resource manager
- To understand the different scheduling policies of OS
- To understand the different memory management techniques
- To understand process concurrency and synchronization
- To understand the concepts of input/ output, storage and file management
- To study different OS and compare their features.

UNIT - I:

Operating System Introduction: Operating Systems Objectives and functions, Computer System Architecture, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, Special - Purpose Systems, Operating System services, user OS Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, OS Structure, Virtual machines.

UNIT - II:

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling, Dispatcher, Scheduling Criteria, Scheduling algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Thread scheduling, Case studies: Linux, Windows.

Process Coordination - Process Synchronization, The Critical section Problem, Peterson's solution, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

UNIT - III:

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table. Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demanding Paging, Page Replacement - Page Replacement Algorithms, Allocation of Frames, Thrashing.

UNIT - IV:

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation - File System Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance.

Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap space Management.

UNIT - V:

Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

Protection - System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

TEXT BOOKS:

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCES BOOKS:

1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
2. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhere, TMH.
3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
4. Operating Systems, A. S. Godbole, 2nd Edition, TMH
5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
6. Operating Systems, S, Haldar and A. A. Arvind, Pearson Education.
7. Operating Systems, R. Elmasri, A. G. Carrick and D. Levine, Mc Graw Hill.
8. Operating Systems in depth, T. W. Doeppner, Wiley.

Outcomes:

- Apply optimization techniques for the improvement of system performance.
- Ability to understand the synchronous and asynchronous communication mechanisms in their respective OS.
- Learn about minimization of turnaround time, waiting time and response time and also maximization of throughput with keeping CPU as busy as possible.
- Ability to compare the different OS

III Year B. Tech. CSE –I Sem

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(R15A0514) COMPUTER NETWORKS**Objectives:**

- To introduce the fundamental types of computer networks.
- To demonstrate the TCP/IP & OSI model merits & demerits.
- To know the role of various protocols in Networking.

UNIT - I:

Introduction: Network, Uses of Networks, Types of Networks, Reference Models: TCP/IP Model, The OSI Model, Comparison of the OSI and TCP/IP reference model. Architecture of Internet.

Physical Layer: Guided transmission media, Wireless transmission media, Switching

UNIT - II:

Data Link Layer - Design issues, Error Detection & Correction, Elementary Data Link Layer Protocols, Sliding window protocols

Multiple Access Protocols - ALOHA, CSMA, CSMA/CD, CSMA/CA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, Data link layer switching: Use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Count to Infinity Problem, Link State Routing, Path Vector Routing, Hierarchical Routing; Congestion control algorithms, QOS IP addresses, CIDR, Subnetting, SuperNetting, IPv4, Packet Fragmentation, IPv6 Protocol, Transition from IPv4 to IPv6, ICMP, ARP, RARP, DHCP

UNIT - IV:

Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, Connection release, Error Control & Flow Control, Multiplexing, Crash Recovery.

The Internet Transport Protocols: UDP, RPC, Real Time Transport Protocols, Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Sliding Window, The TCP Congestion Control,

UNIT - V: Application Layer- Introduction, providing services, Applications layer paradigms: Client server model, HTTP, FTP, E-mail, WWW, TELNET, DNS, SSH; RSA algorithm, Network Management: SNMP,

TEXT BOOKS:

1. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.
2. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.

REFERENCES BOOKS:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.
3. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Education.

Outcomes:

- Students should be understand and explore the basics of Computer Networks and Various Protocols. Student will be in a position to understand the World Wide Web concepts.
- Students will be in a position to administrate a network and flow of information further Student can understand easily the concepts of network security, Mobile, and ad hoc networks.

III Year B. Tech. CSE –I Sem

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**(R15A0515) ADVANCED COMPUTER ARCHITECTURE
(Core Elective-I)**

Objectives:

- To learn the fundamental aspects of computer architecture design and analysis.
- The course focuses on processor design, pipelining, superscalar, out-of-order execution, caches (memory hierarchies), virtual memory, storage systems, and simulation technique

Unit – I

Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

Unit – II

Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands- addressing modes for signal processing-operations in the instruction set- instructions for control flow- encoding an instruction set.-the role of compiler.

Unit – III

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP,ILP software approach- compiler techniques- static branch protection – VLIW approach – H.W support for more ILP at compile time- H.W verses S.W Solutions

Unit – IV

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM. Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

Unit – V

Storage systems- Types – Buses – RAID- errors and failures- bench marking a storage device- designing a I/O system. Inter connection networks and clusters- interconnection network media – practical issues in interconnecting networks- examples – clusters- designing a cluster.

TEXT BOOK:

1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann (An Imprint of Elsevier)

REFERENCES:

1. "Computer Architecture and parallel Processing" Kai Hwang and A. Briggs International Edition McGraw-Hill.
2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.
3. Parallel Computer Architecture, A Hardware / Software Approach, David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier

Outcomes:

- Will know about computer performance, instruction set architecture design and implementation
- Will know about und processor implementation alternatives (single- cycle, multiple-cycle, and pipelined implementations)

III Year B. Tech. CSE –I Sem

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(R15A0516) DISTRIBUTED DATA BASES**(Core Elective-I)****Objectives:**

The aim of the course is to

- Enhance the previous knowledge of database systems by deepening the understanding of the theoretical and practical aspects of the database technologies, and showing the need for distributed database technology to tackle deficiencies of the centralized database systems;
- Introduce basic principles and implementation techniques of distributed database systems
- Expose active and emerging research issues in distributed database systems and application development
- Apply theory to practice by building and delivering a distributed database query engine, subject to remote Web service calls.

UNIT – I

Features of Distributed versus Centralized Databases, Principles of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases. Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT – II

Optimization of Access Strategies, a Framework for Query Optimization, Join Queries, General Queries. The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions. Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, and Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT –III

Reliability, Basic Concepts, No blocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

UNIT –IV

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Sizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, query Execution, Transaction Management, Transaction Management inject DBMSs, Transactions as Objects.

UNIT –V

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management Transaction and Computation Model Multi database Concurrency Control, Multi database Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies

TEXT BOOKS:

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill

REFERENCES:

1. An Introduction to Database Systems, C. J. Date, 8th Edition, Addison-Wesley, 2003, PP. 651 - 660

Outcomes:

After the completion of the course, the students are expected to

- Get familiar with the currently available models, technologies for and approaches to building distributed database systems and services;
- Have developed practical skills in the use of these models and approaches to be able to select and apply the appropriate methods for a particular case;
- Be aware of the current research directions in the field and their possible outcomes;
- 4) be able to carry out research on a relevant topic, identify primary references, analyze them, and come up with meaningful conclusions;
- Be able to apply learned skills in solving practical database related tasks.

III Year B. Tech. CSE –I Sem

L T/P/D C

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**(R15A0517) COMPUTER GRAPHICS
(Core Elective-I)**

Objectives:

- To make students understand about fundamentals of Graphics to enable them to design animated scenes for virtual object creations.
- To make the student present the content graphically.

UNIT-I:

Introduction: Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

UNIT-II:

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems

2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm

UNIT-III:

3-D object representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D viewing : Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT-IV:

Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

UNIT-V:

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications

TEXT BOOKS:

1. "Computer Graphics C version", Donald Hearn and M.Pauline Baker, Pearson Education
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Finer and Hughes, Pearson Education.

REFERENCES:

1. Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
2. Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
4. Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

Outcomes:

- Students can animate scenes entertainment.
- Will be able to work in computer aided design for content presentation..
- Better analogy data with pictorial representation.

III Year B. Tech. CSE – I Sem

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**(R15A0064) ENTERPRISE RESOURCE PLANNING
(Open Elective-III)**

Objectives:

- It enables the student to understand the foundations of Enterprise planning and ERP System Options.

Unit-I

Introduction to ERP: Foundation for Understanding ERP systems-Business benefits of ERP-The challenges of implementing ERP system-ERP modules and Historical Development.

Unit-II

ERP System Options & Selection Methods: Measurement of project Impact- information Technology Selection-ERP proposal evaluation-Project Evaluation Technique.

Unit-III

ERP System Installation Options: IS/IT Management results-Risk Identification analysis-System Projects- Demonstration of the system-Failure method-system Architecture & ERP.

Unit-IV

ERP-Sales and Marketing- Management control process in sales and marketing-ERP customer Relationship Management-ERP systems- Accounting & Finance control processes. Financial modules in ERP systems.

Unit-V

ERP–Production and Material Management-Control process on production and manufacturing-Production module in ERP- supply chain Management & e-market place-e-businesses & ERP-e supply chain & ERP- Future directions for ERP.

TEXT BOOK:

- Mary Sumner “Enterprise Resource Planning” Pearson, 2012.
- David L.Olson “Managerial Issues in ERP systems” TMH 2012.

REFERENCES:

- Ellen Monk “Enterprise Resource Planning” Cengage, 2012.
- Alexis Leon “Enterprise Resource Planning” 2nd Edition, TMH ,2012
- Goyal “Enterprise Resource Planning” TMH, 2012
- Jagan Nathan Vaman “ERP Strategies for Steering Organizational competence and competitive Advantage” TMH, 2012.
- Rajesh Ray “Enterprise Resource Planning” TMH, 2012
- Jyotindra Zaveri, Enterprise Resource Planning, HPH, 2012.

Outcomes:

- The student understands the challenges in implementation of ERP system, ERP System Implementation options, and functional modules of ERP.

III Year B. Tech. CSE – I Sem

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**(R15A0065) MANAGEMENT SCIENCE
(Open Elective-III)**

Objectives:

- This course is intended to familiarize the students with the basic knowledge of Management related concepts, Organization structures, Control charts, Marketing management, Human resource management, Project management, Strategic management in order to achieve the positions of future leaders and managers.

Unit-I

Introduction to Management: Nature of Management, importance functions of Management, Systems approach to Management, Taylor's scientific Management theory, Fayal's principles of Management, Maslow's need hierarchy theory, McGregor's Theory X and Theory Y, Hertzberg Two Factor Theory of Motivation, Leadership Styles, Social responsibilities of Management.

Unit-II

Organization Structures, Control charts and Marketing Management: Line Organization structure, Line and Staff organization structure, Matrix organization structure, Team Organization structure, Control charts (\bar{X} chart, R chart, C chart, P chart), EOQ, ABC analysis, Functions of Marketing, Marketing Mix, Marketing strategies based on PLC.

Unit-III

Human Resource Management: Importance of HRM, HRM Vs PMIR (Personnel Management and Industrial Relations), Functions of HR Manager: Man power planning, Recruitment, Selection, Training and Development, Wage and Salary administration, Performance Appraisal, Grievance handling and welfare administration, Job evaluation, and merit rating.

Unit-IV

Project Management(PERT and CPM): Network analysis, Program Evaluation and Review Technique(PERT), Critical Path Method (CPM), Identifying Critical path, Probability of completing the project within given time, Project cost analysis, Project crashing(simple problems).

Unit-V

Strategic Management: Vision, Mission, Goals, Objectives, Policy, Strategy, Programs, Corporate planning process, Environmental scanning, SWOT analysis, Steps in strategy formulation and implementation.

TEXT BOOKS:

- Harold Koontz, Heinz Weihrich, A.R.Aryasri, Principles of Management, TMH, 2010.
- K. Aswathappa, "Human Resource Management, Text and Cases", TMH, 2011.
- Philip Kotler, Kevin Lane Keller, Abraham Koshy and Mithleshwar Jha: Marketing Management, 13/e, Pearson Education, 2012.

4. Dipak Kumar Bhattacharyya, Production and Operations Management, Universities Press, 2012.

REFERENCES:

1. Dilip Kumar Battacharya, Principles of Management, Pearson, 2012.
2. Gary Dessler, "Human Resource Management", 12 Edition, Pearson- 2012.
3. Rajan Saxena: Marketing Management, 4/e, TMH, 2013
4. Aryasri: Management Science, McGraw Hill, 2012

Outcomes:

- Students will be knowing the basic management practices, functional areas of the organization which helps the students to build up their career in the corporate world.

III Year B. Tech. CSE – I Sem

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**(R15A0069) INTELLECTUAL PROPERTY RIGHTS
(Open Elective-III)**

Objectives:

- The objective of this course is to provide the knowledge on International IPR's and to make students efficient to take decisions in Global Corporate.

Unit-I

Introduction: Intellectual property rights basics, the role and value of IP in international commerce, Issues affecting IP internationally. Agreement on trade related aspects of Intellectual Property Rights. (TRIPS) - Agreement on TRIPS and India.

Unit-II

Parties to IP Rights: Owner, customer, authorized user, licensee, attorney, protection of the weak and strong, finalizing ownership and use rights.

Unit-III

Ensuring the value of IP: Ensuring the value of IP at creation stage, after creation stage, precise contractual protection of IP rights. Key issues related to IP internationally. IP rights in international forums. Fundamentals in Country legal systems, generalities. Validity of IP rights locally: specifics.

Unit-IV

Managing IP Rights: Acquiring IP Rights: letters of instruction, joint collaboration agreement, work made for hire agreement - Protecting IP Rights: non disclosure agreement, cease and desist letter, settlement memorandum. Transferring IP Rights: assignment contract, license agreement, deed of assignment or license agreement, addendum to unrecorded assignment or license.

Unit-V

Remedies and IPR Evaluation - GATT - WTO - Role of WTO in solving IPR issues.

TEXT BOOKS:

- A short course in International Intellectual Property Rights – Karla C. Shippey, World Trade Press – 2nd Edition.
- Intellectual Property Rights – Heritage, Science, & Society under international treaties – A. Subbian, - Deep & Deep Publications – New Delhi.

REFERENCES:

- Intellectual Property Rights: N K Acharya: ISBN: 9381849309
- Intellectual Property Rights: C B Raju : ISBN-8183870341
- Intellectual Property : Examples and Explanation – Stephen M McJohn, 2/e, ISBN-13: 978-0735556652
- Intellectual Property Rights in the Global Economy – Keith E Maskus, PIIE, ISBN paper 0-88132-282-2

Outcomes:

- It allows students how to prepare and protect the Inventions, start up ideas and rights of patents and copy rights etc.,
- This subject brings awareness to the students about the basic legal aspects at present following at Global level.

III Year B.Tech-CSE I – Sem

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(R15A0586) COMPILER DESIGN LAB**Objectives:**

- To provide an Understanding of the language translation peculiarities by designing complete translator for an abstract mini language whose syntax by BNF notation in following lines.

SOURCE (MINI) LANGUAGE (A Case Study)

Consider the following mini language, a simple procedural High Level Language, operating on integer data with a syntax looking vaguely like a simple C crossed with Pascal. The syntax of the language is defined by the following BNF grammar:

```

<program> ::= <block>
<block> ::= { <variable definition> <slist> }
           | { <slist> }
<variable definition> ::= int <vardeflist> ;
<vardeflist> ::= <vardec> | <vardec>, <vardeflist>
<vardec> ::= <identifier> | <identifier> [<constant>]
<slist> ::= <statement> | <statement> ; <slist>
<statement> ::= <assignment> | <ifstatement> | <whilestatement> | <block>
              | <printstatement> | <empty>
<assignment> ::= < identifier> = <expression>
               | < identifier> [<expression>] = [<expression>]
<ifstatement> ::= if <bexpression> then <slist> else <slist> endif
               | if <bexpression> then <slist> endif
<whilestatement> ::= while <bexpression> do <slist> enddo
<printstatement> ::= print{ <expression> }
<expression> ::= <expression> <addingop> <term> | <term> | <addingop> <term>
<bexpression> ::= <expression> <relop> <expression>
<relop> ::= < | <= | = = | >= | > | !=
<addingop> ::= + | -
<term> ::= <term> <multop> <factor> | <factor>
<multop> ::= * | /
<factor> ::= <constant> | <identifier> | <identifier> [<expression>]
           | (<expression>)
<constant> ::= <digit> | <digit> <constant>
<identifier> ::= <identifier> <letterordigit> | <letter>
<letterordigit> ::= a|b|c|...|y|z
<digit> ::= 0|1|2|3|...|8|9
<empty> ::= has the obvious meaning

```

Comments : zero or more characters enclosed between the standard C/Java style comment brackets /* ... */. The language has the rudimentary support for 1-Dimensional arrays. Ex: int a[3] declares a as an array of 3 elements, referenced as a[0],a[1],a[2].

Sample Program written in this language is :

```

{
  int a[3],t1,t2;

```



```
t1=2;
a[0]=1; a[1]=2; a[t1]=3;
t2= -(a[2]+t1*6) / a[2]-t1);
if t2>5 then
print(t2);
else
{
int t3;
t3=99;
t2=25;
print(-11+t2*t3); /* this is not a comment on two lines */
}
endif
}
```

1. Write a C Program to scan and count the number of characters, words, and line of a file.
2. Write a program for implementation of NFAs that recognize identifiers, constants, and operators of the mini language.
3. Write a program for the implementation of DFAs that recognize identifiers, constants, and operators of the mini language.
4. Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
5. Implement the lexical analyzer using JLex, flex, flex or lex or other lexical analyzer generating tools.
6. Design Predictive parser for the given language.
7. Design LALR bottom up parser for the above language.
8. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree or Three Address code.
9. Write program to generate machine code from the abstract syntax tree generated by the parser. The following instruction set may be considered as target code.

The following is a simple register-based machine, supporting a total of 17 instructions. It has three distinct internal storage areas. The first is the set of 8 registers, used by the individual instructions as detailed below, the second is an area used for the storage of variables and the third is an area used for the storage of program. The instructions can be preceded by a label. This consists of an integer in the range 1 to 9999 and the label is followed by a colon to separate it from the rest of the instruction. The numerical label can be used as the argument to a jump instruction, as detailed below.

In the description of the individual instructions below, instruction argument types are specified as follows:

R specifies a register in the form R0, R1, R2, R3, R4, R5, R6 or R7 (or r0, r1, etc).

L specifies a numerical label (in the range 1 to 9999).

V specifies a "variable location" (a variable number, or a variable location pointed to by a register - see below).

A specifies a constant value, a variable location, a register or a variable location pointed to by a register (an indirect address). Constant values are specified as an integer value, optionally preceded by a minus sign, preceded by a # symbol. An indirect address is specified by an @ followed by a register.

So, for example an A-type argument could have the form 4 (variable number 4), #4 (the constant value 4), r4 (register 4) or @r4 (the contents of register 4 identifies the variable location to be accessed).

The instruction set is defined as follows:

LOAD A, R : Loads the integer value specified by A into register R.

STORE R, V : Stores the value in register R to variable V.

OUT R : Outputs the value in register R.

NEG R : Negates the value in register R.

ADD A, R : Adds the value specified by A to register R, leaving the result in register R.

SUB A, R : Subtracts the value specified by A from register R, leaving the result in register R.

MUL A, R : Multiplies the value specified by A by register R, leaving the result in register R.

DIV A, R : Divides register R by the value specified by A, leaving the result in register R.

JMP L : Causes an unconditional jump to the instruction with the label L.

JEQ R, L : Jumps to the instruction with the label L if the value in register R is zero.

JNE R, L : Jumps to the instruction with the label L if the value in register R is not zero.

JGE R, L : Jumps to the instruction with the label L if the value in register R is greater than or equal to zero.

JGT R, L : Jumps to the instruction with the label L if the value in register R is greater than zero.

JLE R, L : Jumps to the instruction with the label L if the value in register R is less than or equal to zero.

JLT R, L : Jumps to the instruction with the label L if the value in register R is less than zero.

NOP : Is an instruction with no effect. It can be tagged by a label.

STOP : Stops execution of the machine. All programs should terminate by executing a STOP instruction.

RECOMMENDED SYSTEM / SOFTWARE REQUIREMENTS:

1. Intel based desktop PC with minimum of 166MHz or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. C++ Compiler and JDK kit, Lex or Flex and YACC tools (Unix/Linux utilities)

USEFUL TEXT BOOKS / REFERECES / WEBSITES :

1. Modern compiler implementation in C, Andrew w.Appel, Revised Edn, Cambridge University Press
2. Principles of Compiler Design. – A.V Aho, J.D Ullman ; Pearson Education.
3. **lex&yacc** , -John R Levine, Tony Mason, Doug Brown; O'reilly.
4. **Compiler Construction**,- LOUDEN, Thomson.
5. Engineering a compiler – Cooper& Linda, Elsevier
6. Modern Compiler Design – Dick Grune, Henry E.Bal, Cariel TH Jacobs, Wiley Dreatech

Outcomes:

By the end of the semester the student will be able to

- Understand the practical approach of how a compiler is designed.
- Apply the techniques used in compiler construction.
- Construct components(few phase) of the compiler for the mini language

III Year B.Tech-CSE I – Sem

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(R15A0587) COMPUTER NETWORKS & OPERATING SYSTEMS LAB

Objectives:

- To understand the functionalities of various layers of OSI model
- To explain the difference between hardware, software; operating systems, programs and files.
- Identify the purpose of different software applications.

Part A:

1. Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
a) FIFO b) LRU c) LFU
8. Simulate Paging Technique of memory management.

Part B:

1. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP
3. Implement Dijkstra's algorithm to compute the Shortest path thru a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm
5. Take an example subnet of hosts . Obtain broadcast tree for it.
6. Using RSA algorithm Encrypt a text data and Decrypt the same.

Outcomes:

The student will have the ability to :

- Understand fundamental underlying principles of computer networking.
- Understand details and functionality of layered network architecture.
- Apply mathematical foundations to solve computational problems in computer networking.
- Describe and demonstrate the functions and features of current operating systems

- Demonstrate proficiency in common industry software applications (word processing, spreadsheet, presentation, and database) to effectively communicate in a professional business setting
- Demonstrate skills that meet industry standards and certification requirements in the use of system hardware, operating systems technologies, and application systems

III Year B.Tech. CSE - I Sem

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(R15A0007) TECHNICAL COMMUNICATION AND SOFT SKILLS**INTRODUCTION:**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

Objectives:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to approach academic subjects more professionally using the theoretical and practical components of the English syllabus.
- To develop the professional skills and communication skills in formal and informal situations and hone the required professional ethics.

Unit- 1: Factors affecting information and document design, Principles of effective writing , Technical Writing, Grammar and Editing- Technical writing process, Writing drafts and revising, Collaborative writing, technical writing style and language.

Unit- 2: Basics of grammar, study of advanced grammar, editing strategies to achieve appropriate technical style. Introduction to advanced technical communication.

Unit-3: Communication and Technical Writing- Public speaking, Group discussion, Oral; presentation, Interviews, Graphic presentation, Presentation aids. Writing reports, Email writing, official notes, business letters, memos, progress reports, minutes of meetings, event report.

Unit- 4: Self Development and Assessment- Self assessment, Awareness, Perception and Attitudes, Values and belief, Personal goal setting, career planning, self esteem.

Unit- 5: Ethics- Business ethics, , Personality Development in social and office settings, netiquettes, Telephone Etiquettes, Engineering ethics, Managing time, Role and

responsibility of engineer, Work culture in jobs, Rapid reading, Complex problem solving, Creativity, leadership skills, cubicle Etiquettes, team building.

Text Books:

1. David F. Beer and David Mc Murrey, Guide to writing as an Engineer, John Willey. New York, 2004
2. Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843)

Reference Books:

1. Dale Jung k, Applied Writing for Technicians, McGraw Hill, New York, 2004. (ISBN: 07828357-4)
2. Sharma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi 2002.
3. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN 0402213)

Outcomes:

- The student will become proficient in LSRW skills.
- They develop formal LSRW skills approach to different situations.
- They hone professional ethics and learn to be proficient formally.

III Year B. Tech. CSE –II Sem

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(R15A0518) OBJECT ORIENTED ANALYSIS AND DESIGN

Objectives:

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

UNIT-I

Introduction to UML, Importance of Modeling, Principles of Modeling, Object oriented modeling, Conceptual model of the UML, Architecture of UML, Software Development Life Cycle.

UNIT-II

Basic Structural Modeling, Classes, Relationships, Common Mechanisms, Basic Diagrams, Advanced Structural Modeling, Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages.

Class and Object Diagrams, Terms, Concepts, Modeling Techniques for Class Diagrams

UNIT-III

Basic Behavioral Modeling-I, Interactions, Interaction Diagrams.

Basic behavioral Modeling-II, Usecases, Use case Diagrams, Activity Diagrams.

UNIT-IV

Advanced Behavioral Modeling, Events and Signals, State Machines, Processes and Threads, Time and Space, State Chart Diagrams.

Architectural Modeling, Component, Deployment, Component Diagrams, Deployment Diagram.

UNIT V

Case Study, The Unified Library application.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education.

REFERENCES :

1. Grady Booch, James Rumbaugh and Ivar Jacobson, "The Unified Modeling Languages User Guide", Addison Wesley, 2004.

2. Ali Bahrami, "Object Oriented Systems Development", Tata McGraw Hill, New Delhi.
3. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.

Outcomes:

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

- Apply fundamental concepts of object-oriented analysis and design approach.
- Understand Unified Modeling Language Notation.
- Apply models for object-oriented system development
- Identify system development design patterns.
- Create use case diagram to represent the scope of development problem domain.
- Develop domain model, sequence diagram, activity diagram and state chart diagram based on use case narrative.
- Apply Unified Modeling Language Notation to object-oriented models.
- Build up experience on adopting object-oriented approach as an alternative methodology for system development.

III Year B. Tech. CSE –II Sem

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(R15A0519) INFORMATION SECURITY**Objectives:**

- Explain the objectives of information security
- Explain the importance and application of each of confidentiality, integrity, authentication and availability
- Understand various cryptographic algorithms.
- Understand the basic categories of threats to computers and networks
- Describe public-key cryptosystem.
- Describe the enhancements made to IPv4 by IPsec
- Understand Intrusions and intrusion detection
- Discuss the fundamental ideas of public-key cryptography.
- Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
- Discuss Web security and Firewalls

UNIT – I

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

UNIT – II

Symmetric key Ciphers: Block Cipher principles & Algorithms(DES, AES, Blowfish), Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4, Location and placement of encryption function, Key distribution **Asymmetric key Ciphers:** Principles of public key cryptosystems, Algorithms(RSA, Diffie-Hellman, ECC), Key Distribution.

UNIT – III

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm **Authentication Applications:** Kerberos, X.509

Authentication Service, Public — Key Infrastructure, Biometric Authentication

UNIT – IV

E-Mail Security: Pretty Good Privacy, S/MIME **IP Security:** IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, Combining security associations, key management

UNIT — V

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction **Intruders, Virus and Firewalls:** Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls **Case Studies on Cryptography and security:** Secure **Inter-branch Payment Transactions, Cross site Scripting Vulnerability, Virtual Elections**

TEXT BOOKS:

1. Cryptography and Network Security : William Stallings, Pearson Education, 4th Edition
2. Cryptography and Network Security : Atul Kahate, Mc Graw Hill, 2nd Edition

REFERENCE BOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 2nd Edition
3. Information Security, Principles and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM.Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

Outcomes:

- Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
- Ability to identify information system requirements for both of them such as client and server.
- Ability to understand the current legal issues towards information security.

III Year B. Tech. CSE –II Sem

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(R15A0520) WEB TECHNOLOGIES**Objectives:**

- Giving the students the insights of the Internet programming and how to design and implement complete applications over the web.
- It covers the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications,
- Programming Common Gateway Interfaces, Programming the User Interface for the web applications.

UNIT I:

Web Basics and Overview: Introduction to Internet, World Wide Web, Web Browsers, URL, MIME, HTTP, Web Programmers Tool box.

HTML Common tags: List, Tables, images, forms, frames, Basics of CSS and types of CSS. Client-Side Programming (Java Script): Introduction to Java Script, declaring variables, functions, Event handlers (onclick, onsubmit, etc.,) and Form Validation.

UNIT II:

Server-Side Programming (PHP): Declaring Variables, Data types, Operators, Control structures, Functions, Reading data from web form controls like text buttons, radio buttons, list, etc., Handling File Uploads, Handling Sessions & Cookies.

Introduction to XML: Document type definition, XML Schemas, Document Object model, Presenting XML , Introduction to XHTML, Using XML Processors: DOM and SAX.

UNIT III:

Web Servers: Introduction to web servers, installation and configuration.

Introduction to Servlets: Lifecycle of a Servlet, JSDK, Deploying Servlet, The Servlet API, The javax. Servlet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Cookies and Session Tracking.

UNIT IV:

Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design and JSP Environment, JSP Declarations, Directives, Expressions, Code Snippets, implicit objects, Requests, Using Cookies and Session for Session Tracking.

UNIT V:

Database Access: Database Programming using JDBC, JDBC drivers, Studying Javax.sql.* package, Connecting to database in PHP, Execute Simple Queries, Accessing a Database from a Servlet and JSP page.

Java Beans: Introduction to Beans, Deploying java Beans in a JSP page.

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT s 1, 2)
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson (UNITs 3,4,5)

REFERENCE BOOKS:

1. Programming world wide web-Sebesta,Pearson Education ,2007.
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
4. Jakarta Struts Cookbook, Bill Siggelkow, S P D O’Reilly for chap 8.
5. March’s beginning JAVA JDK 5, Murach, SPD
6. An Introduction to Web Design and Programming –Wang-Thomson

Outcomes:

- Analyze a web page and identify its elements and attributes.
- Create web pages using XHTML and Cascading Styles sheets.
- Installation and usage of Server software’s.
- Database Connectivity to web applications
- Build web applications using Servlet and JSP

III Year B. Tech. CSE –II Sem

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(R15A0521) SOFTWARE TESTING METHODOLOGIES**Objectives:**

- This course is designed to enable a clear understanding and knowledge of the foundations, techniques, and tools in the area of software testing and its practice in the industry. The course will prepare students to be leaders in software testing. Whether you are a developer or a tester, you must test software. This course is a unique opportunity to learn strengths and weaknesses of a variety of software testing techniques

UNIT I:

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

UNIT II:

Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT III:

Transaction Flow Testing: Transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing. Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT IV:

Paths, Path products and Regular expressions : Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.
Logic Based Testing : Overview, decision tables, path expressions, kv charts, specifications.

UNIT V:

State, State Graphs and Transition testing : State graphs, good & bad state graphs, state testing, Testability tips. Graph Matrices and Application : Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. Usage of JMeter and Winrunner tools for functional / Regression testing, creation of test script for unattended testing, synchronization of test case, Rapid testing, Performance testing of a data base application and HTTP connection for website access.

TEXT BOOKS:

- Software Testing techniques - Baris Beizer, Dreamtech, second edition.
- Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

REFERENCES:

- The craft of software testing - Brian Marick, Pearson Education.
- Software Testing Techniques – SPD(Oreille)

3. Software Testing in the Real World – Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing – Meyers, John Wiley.

Outcomes:

Where will this subject help?

- Test process and continuous quality improvement
- Test generation from requirements
- Modeling techniques: UML: FSM and State charts, Combinatorial design; and others.
- Test generation from models.
- Test adequacy assessment.
- Industrial applications

III Year B.Tech. CSE -II Sem

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INFORMATION SECURITY MANAGEMENT (SECURITY ANALYST – I)

(Core Elective-II)

Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of Security Analyst
- To introduce the tools, technologies & programming languages which is used in day to day security analyst job role.

Unit I

Information Security Management:

Information Security Overview, Threats and Attack Vectors, Types of Attacks, Common Vulnerabilities and Exposures (CVE), Security Attacks, Fundamentals of Information Security, Computer Security Concerns, Information Security Measures etc.

Manage your work to meet requirements (NOS 9001).

Unit II

Fundamentals of Information Security:

Key Elements of Networks, Logical Elements of Network, Critical Information Characteristics, Information States etc.

Work effectively with Colleagues (NOS 9002).

Unit III

Data Leakage:

What is Data Leakage and statistics, Data Leakage Threats, Reducing the Risk of Data Loss, Key Performance Indicators (KPI), Database Security etc.

Unit IV

Information Security Policies, Procedures and Audits:

Information Security Policies-necessity-key elements & characteristics, Security Policy Implementation, Configuration, Security Standards-Guidelines & Frameworks etc.

Unit V

Information Security Management — Roles and Responsibilities:

Security Roles & Responsibilities, Accountability, Roles and Responsibilities of Information Security Management, team-responding to emergency situation-risk analysis process etc.

TEXT BOOK:

1. Management of Information Security by Michael E. Whitman and Herbert J. Mattord

REFERENCES:

1. <http://www.iso.orcdiso/home/standards/management-standards/iso27001.htm>
2. <http://csrc.nist.ciov/publicationsinistpubs/800-55-Rev1/SP800-55-revi.pdf>

III Year B.Tech. CSE -II Sem

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**(R15A0523) INTRODUCTION TO ANALYTICS
(ASSOCIATE ANALYTICS I)
(Core Elective-II)**

Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of Analytics for Business
- To introduce the tools, technologies & programming languages which is used in day to day analytics cycle

Unit I**Introduction to Analytics and R programming (NOS 2101):**

Introduction to R, RStudio (GUI): R Windows Environment, introduction to various data types, Numeric, Character, date, data frame, array, matrix etc., Reading Datasets, Working with different file types .txt,.csv etc. Outliers, Combining Datasets, R Functions and loops.

Manage your work to meet requirements (NOS 9001):

Understanding Learning objectives, Introduction to work & meeting requirements, Time Management, Work management & prioritization, Quality & Standards Adherence,

Unit II**Summarizing Data & Revisiting Probability (NOS 2101):**

Summary Statistics - Summarizing data with R, Probability, Expected, Random, Bivariate Random variables, Probability distribution. Central Limit Theorem etc.

Work effectively with Colleagues (NOS 9002):

Introduction to work effectively, Team Work, Professionalism, Effective Communication skills, etc.

Unit III**SQL using R:**

Introduction to NoSQL, Connecting R to NoSQL databases. Excel and R integration with R connector.

Unit IV**Correlation and Regression Analysis (NOS 9001):**

Regression Analysis, Assumptions of OLS Regression, Regression Modelling. Correlation, ANOVA, Forecasting, Heteroscedasticity, Autocorrelation, Introduction to Multiple Regression etc.

Unit V**Understand the Verticals - Engineering, Financial and others (NOS 9002):**

Understanding systems viz. Engineering Design, Manufacturing, Smart Utilities, Production lines, Automotive, Technology etc.

Understanding Business problems related to various businesses

Requirements Gathering

Gathering all the data related to Business objective

TEXT BOOK:

1. **Student's Handbook for Associate Analytics.**

REFERENCE BOOKS:

1. **Introduction to Probability and Statistics Using R**, ISBN: 978-0-557-24979-4, is a textbook written for an undergraduate course in probability and statistics.
2. An Introduction to R, by Venables and Ripley and the R Development Core Team. This may be downloaded for free from the R Project website (<http://www.r-project.org/>, see Manuals). There are plenty of other free references available from the R Project website.
3. Montgomery, Douglas C., and George C. Runger, Applied statistics and probability for engineers. John Wiley & Sons, 2010
4. The *Basic Concepts of Time Series Analysis*.<http://anson.ucdavis.edu/~azarifsta137/AuNotes.pdf>
5. **Time Series Analysis and Mining with R**, Yanchang Zhao.

III Year B. Tech. CSE –II Sem

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(R15A0524) DISTRIBUTED SYSTEMS**(Core Elective-II)****Objectives:**

- To learn the principles, architectures, algorithms and programming models used in distributed systems.
- To examine state-of-the-art distributed systems, such as Google File System.
- To design and implement sample distributed systems.

UNIT I

Characterization of Distributed Systems: Introduction, Examples of Distributed systems, Resource sharing and web, challenges.

System models: Introduction, Architectural and Fundamental models, networking and Internetworking, Interposes Communication.

UNIT II

Time and Global States: Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global States, distributed debugging.

Coordination and Agreement: Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

UNIT III

Inter process Communication: Introduction ,The API for the Internet Protocols, External Data Representation and Marshalling, Client –Server Communication, Group Communication, Case Study: IPC in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between distributed objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI

UNIT IV

Distributed File Systems: Introduction, File Service Architecture, Case Study

1: Sun Network File System, Case Study2:The Andrew File System

Name Services: Name Services: Introduction, Name Services and the Domain Name System, Case study of the Global Name Service

Distributed Shared Memory: Introduction, Design and Implementation issues, Sequential consistency and Ivy case study, Release consistency and Munin case study, Other consistency models.

UNIT V

Transactions and Concurrency control: Introduction, Transactions, Nested Transactions, Locks, optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

Distributed Transactions: Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

TEXT BOOKS:

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education. 2009.

REFERENCES:

1. Distributed Systems, Principles and paradigms, Andrew S.Tanenbaum, Maarten Van Steen, Second Edition, PHI.
2. Distributed Systems, An Algorithm Approach, Sikumar Ghosh, Chapman & Hall/CRC, Taylor & Fransis Group, 2007.

Outcomes:

- Students will identify the core concepts of distributed systems: the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way.
- Students will examine how existing systems have applied the concepts of distributed systems in designing large systems, and will additionally apply these concepts to develop sample systems.

III Year B. Tech. CSE –II Sem

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(R15A0525) NEURAL NETWORKS**(Core Elective-II)****Objectives:**

- To gain familiarity with a wide variety of neural network models and their applications.
- To develop capabilities for creating and using neural network models.
- To develop knowledge of the state-of-the-art in neural networks, and
- To gain some mathematical understanding of neural network models.
- To gain experience in using computational tools such as neural networks to perform computational experiments leading to new theoretical insights.

UNIT I

INTRODUCTION-what is a neural network? Human Brain, Models of a Neuron, Neural networks **viewed** as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks

LEARNING PROCESS 1–Error Correction learning, Memory based learning, Hebbian learning,

UNIT II

LEARNING PROCESS 2-Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process

SINGLE LAYER PERCEPTRONS-Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perception –convergence theorem, Relation between perception and Bayesian classifier for a Gaussian Environment.

UNIT III

MULTILAYER PERCEPTRON-Back propagation algorithm XOR problem, Heuristics, Output **representation** and decision rule, Computer experiment, feature detection,

BACK PROPAGATION-back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning.

UNIT IV

SELF ORGANIZATION MAPS -Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive patter classification, Hierarchical Vector quantization, contextual Maps

UNIT V

NEURO DYNAMICS-Dynamical systems, stability of equilibrium states, attractors, neuro dynamical models, manipulation of attractors' as a recurrent network paradigm

HOPFIELD MODELS-Hopfield models, computer experiment I

TEXT BOOK:

1. Neural networks a comprehensive foundation, Simon Hhaykin, Pearson Education 2nd Edition 2004

REFERENCE BOOKS:

1. Artificial neural networks B.Yegnanarayana Prentice Hall of India P Ltd 2005
2. Neural networks in Computer intelligence, Li Min Fu TMH 2003
3. Neural networks James A Freeman David M S kapura Pearson Education 2004

Outcomes:

- Able to develop some mathematical competence for understanding neural networks,
- Able to learn which types of neural networks are used for which purposes such as in discriminators, classifiers, computation, etc.
- Able to learn how neural networks are implemented using training algorithms such as feed forward, back-propagation.
- Able to learn how neural networks can be applied to a broad range of problems.

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(R15A0424) EMBEDDED SYSTEMS DESIGN**(Open Elective-IV)****Objectives:**

For embedded systems, the course will enable the students to:

- Understand the basics of an embedded system.
- Program an embedded system.
- To learn the design process of embedded system applications.
- To understand the RTOS and inter-process communication.
- To understand different communication interfaces.

UNIT-I INTRODUCTION TO EMBEDDED SYSTEMS

Complex systems and microprocessors-embedding computers, characteristics of embedded computing applications, challenges in embedded computing system design, performance in embedded computing; The embedded system design process-requirements, specification, architecture design, designing hardware and software, components, system integration, design example.

UNIT-II TYPICAL EMBEDDED SYSTEM

Core of the embedded system-general purpose and domain specific processors, ASICs, PLDs, COTs; Memory-ROM, RAM, memory according to the type of interface, memory shadowing, memory selection for embedded systems; Sensors, actuators and other components-sensors, actuators, seven segment LED, relay, piezo buzzer, push button switch, reset circuit, brownout protection circuit, oscillator circuit real time clock, watch dog timer.

UNIT-III EMBEDDED FIRMWARE DESIGN AND DEVELOPMENT

Embedded firmware design approaches-super loop based approach, operating system based approach; Embedded firmware development languages-assembly language based development, high level language based development; Programming in embedded c.

UNIT-IV RTOS BASED EMBEDDED SYSTEM DESIGN

Operating system basics, types of operating systems, tasks, process and threads, multiprocessing and multitasking, task scheduling: non-preemptive and pre-emptive scheduling; task communication-shared memory, message passing.

UNIT-V COMMUNICATION INTERFACE

Onboard communication interfaces-I2C, SPI, UART, 1 wire interface, parallel interface; External communication interfaces-RS232 and RS485,USB, infrared, Bluetooth, wi-Fi, zigbee, GPRS; Automotive networks and sensor networks.

TEXT BOOKS:

1. Computers as Components –Wayne Wolf, Morgan Kaufmann (second edition).
2. Introduction to Embedded Systems - shibu k v, Mc Graw Hill Education.

REFERENCE BOOKS:

1. Embedded System Design -frank vahid, tony grivargis, john Wiley.
2. Embedded Systems- An integrated approach - Lyla b das, Pearson education 2012.
3. Embedded Systems – Raj kamal, TMH
4. An embedded Software Primer, David e Simon, Pearson education

Outcomes:

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

- Understand and design the embedded systems
- Learn the basics of OS and RTOS
- Understand types of memory and interfacing to external world
- Understand embedded firmware design approaches

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(R15A0426) DIGITAL IMAGE PROCESSING

Objectives:

The course objectives are:

- Provide the student with the fundamentals of digital image processing
- Give the students a taste of the applications of the theories taught in the subject. This will be achieved through the project and some selected lab sessions.
- Introduce the students to some advanced topics in digital image processing.
- Give the students a useful skill base that would allow them to carry out further study should they be interested and to work in the field.

UNIT I

Digital image fundamentals & Image Transforms:- Digital Image fundamentals, Sampling and quantization, Relationship between pixels.

Image Transforms: 2-D FFT , Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform.

UNIT II

Image enhancement (spatial domain) : Introduction, Image Enhancement in Spatial Domain, Enhancement Through Point Operation, Types of Point Operation, Histogram Manipulation, Linear and non linear gray level Transformation, local or neighborhood operation, median filter,spatial domain high-pass filtering.

Image enhancement (Frequency domain): Filtering in Frequency Domain, Obtaining Frequency Domain Filters from Spatial Filters, Generating Filters Directly in the Frequency Domain, Low Pass(smoothing) and High Pass (sharpening) filters in Frequency Domain

UNIT III

Image Restoration: Degradation Mode, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration

UNIT IV

Image segmentation: Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation

Morphological Image Processing :Dilation and Erosion, Dilation, Structuring Element Decomposition, Erosion, Combining Dilation and Erosion, Opening and Closing, The Hit or Miss Transformation.

UNIT V

Image Compression:

Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

TEXT BOOKS:

1. Digital Image Processing- Rafeal C.Gonzalez, Richard E.Woods, 3rd Edition, Pearson, 2008
2. Digital Image Processing- S Jayaraman, S. Essakirajan, T. Veerakumar-TMH,2010

REFERENCE BOOKS:

1. Digital Image Processing and analysis-human and computer vision application with using CVIP Tools – Scotte Umbaugh, 2nd Ed, CRC Press, 2011
2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
3. Fundamentals of Digital Image Processing-A.K. Jain, PHI, 1989
4. Digital Image Processing and computer Vision-Somka, Halavac, Boyle-Cengage learning (Indian edition) 2008,
5. Digital Image Processing using Matlab, Rafeal C. Gonzalez, Richard E. Woods, Steven L. Eddins, Pearson Education.
6. Introduction to Image Processing & Analysis-John C. Russ, J. Christian Russ, CRC Press, 2010
7. Digital Image Processing with MATLAB & Labview-Vipula Singh Elsevier

Outcomes:

- Upon Successfully completing the course, the student should:
- Have an appreciation of the fundamentals of Digital Image Processing including the topics of filtering, transforms and morphology, and image analysis and compression
- Be able to implement basic image processing algorithms in MATLAB.
- Have the skill base necessary to further explore advanced topics of Digital Image Processing.
- Be in a position to make a positive professional contribution in the field of Digital Image Processing.
- At the end of the course the student should have a clear impression of the breadth and practical scope of Digital Image Processing and have arrived at a level of understanding that is the foundation for most of the work currently underway in this field.

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(R15A0432) WIRELESS COMMUNICATIONS AND NETWORKS**(Open Elective-IV)****Objectives:**

- To provide the students with the fundamental treatment about many practical and theoretical concepts that forms basic of wireless communication to equip the students with various kinds of wireless networks and its operations.
- To prepare the students to understand the concept of frequency reuse and be able to apply it in the design of mobile cellular system
- To prepare the students to understand various modulation schemes and multiple access techniques that are used in wireless communications
- To provide an analytical perspective on the design and analysis the traditional and emerging wireless networks and to discuss the nature of and solution methods to the fundamental problems in the wireless networking
- To train the students to understand the architecture and operation of various wireless WAN such as GSM, IS-95, GPRS and SMS
- To train students to understand wireless LAN architectures and operations
- To prepare students to understand the emerging technique OFDM and its importance in the wireless communications

UNIT -I

INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS: Evolution of mobile radio communications, examples of wireless communication systems-paging systems, cordless telephone systems, cellular telephone systems, comparison of common wireless communication systems, trends in cellular radio and personal communications. MODERN WIRELESS COMMUNICATION SYSTEMS: Second generation (2G) cellular networks, third generation (3G) wireless networks, wireless local loop (WLL) and LMDS, wireless local area networks (WLANs), Bluetooth and personal area networks (PANs).

UNIT –II:

Mobile Radio Propagation: Large-Scale Path Loss: Introduction to Radio Wave Propagation, Free Space Propagation Model, Relating Power to Electric Field, The Three Basic Propagation Mechanisms, Reflection-Reflection from Dielectrics, Brewster Angle, Reflection from perfect conductors, Ground Reflection (Two-Ray) Model, Diffraction-Fresnel Zone Geometry, Knife-edge Diffraction Model, Multiple knife-edge Diffraction, Scattering, Outdoor Propagation Models-Longley-Ryce Model, Okumura Model, Hata Model, PCS Extension to Hata Model, Walfisch and Bertoni Model, Wideband PCS Microcell Model, Indoor Propagation Models-Partition losses (Same Floor), Partition losses between Floors, Log-distance path loss model, Ericsson Multiple Breakpoint Model, Attenuation Factor Model, Signal penetration into buildings, Ray Tracing and Site Specific Modeling.

UNIT –III:

Mobile Radio Propagation: Small –Scale Fading and Multipath Small Scale Multipath propagation-Factors influencing small scale fading, Doppler shift, Impulse Response Model of a multipath channel-Relationship between Bandwidth and Received power, Small-Scale Multipath Measurements-Direct RF Pulse System, Spread Spectrum Sliding Correlator Channel Sounding, Frequency Domain Channels Sounding, Parameters of Mobile Multipath Channels-Time Dispersion Parameters, Coherence Bandwidth, Doppler Spread and Coherence Time, Types of Small-Scale Fading-Fading effects Due to Multipath Time Delay Spread, Flat fading, Frequency selective fading, Fading effects Due to Doppler Spread-Fast fading, slow fading, Statistical Models for multipath Fading Channels-Clarke’s model for flat fading, spectral shape due to Doppler spread in Clarke’s model, Simulation of Clarke and Gans Fading Model, Level crossing and fading statistics, Two-ray Rayleigh Fading Model.

UNIT –IV

WI-FI AND THE IEEE 802.11 WIRELESS LAN STANDARD: IEEE 802 Architecture, IEEE 802.11 Architecture and Services, 802.11 Medium Access Control, 802.11 Physical Layer, Other IEEE 802.11 Standards, Wi-Fi Protected Access. BLUETOOTH AND IEEE 802.15: Overview, radio specification, baseband specification, link manager specification, logical link control and adaptation protocol, IEEE 802.15.

UNIT -V

MOBILE DATA NETWORKS: Introduction, data oriented CDPD network, GPRS and higher data rates, short messaging service in GSM, mobile application protocols. WIRELESS ATM & HIPERLAN: Introduction, Wireless ATM, HIPERLAN, HIPERLAN-2.

TEXT BOOKS:

1. Theodore S. Rappaport (2002), Wireless Communications –Principles Practice, 2nd edition, Prentice Hall of India, New Delhi.
2. William Stallings (2009), Wireless Communications and Networks, 2nd edition, Pearson Education, India.
3. Kaveh Pahlavan, Prashanth Krishna Murthy (2007), Principles of Wireless Networks –A Unified Approach, Pearson Education, India.

REFERENCE BOOKS:

1. Dr. Kamilo Feher (2003), Wireless Digital Communications, Prentice Hall of India, New Delhi.
2. Jochen Schiller (2009), Mobile Communications, 2nd edition, Pearson Education, India.
3. Andreas F. Molisch (2006), Wireless Communications, Wiley –India, New Delhi.

Outcomes:

Upon completion of the course the student will be able to:

- Understand the principles of wireless communications
- Understand fundamentals of wireless networking
- Understand cellular system design concepts
- Analyze various multiple access schemes using wireless communication
- Understand Wireless WANs and their performance analysis
- Demonstrate wireless LAN and their specifications
- Familiar with some of the existing and emerging wireless standards
- Understand the concept of OFDM

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(R15A0588) CASE TOOLS & WEB TECHNOLOGIES LAB CASE TOOLS LAB**Objectives:**

Understand how UML supports the entire GOAD process.

Become familiar with all phases of GOAD.

Understand different software testing tools and their features

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM system whose description is given below.

UML diagrams to be developed are:

1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.
7. Component Diagram
8. Deployment Diagram.
9. Test Design.

Description for an ATM System

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.

5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer.

When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

Outcomes:

- Ability to understand the history, cost of using and building CASE tools.
- Ability to construct and evaluate hybrid CASE tools by integrating existing tools.

WEB TECHNOLOGIES LAB

Objectives:

- To enable the student to program web applications using the following technologies HTML, Javascript ,AJAX ,PHP ,Tomcat Server, Servlets ,JSP

Week 1

Design the following static web pages required for an online book store web site.

1) HOME PAGE: The static home page must contain three **frames**.

2) LOGIN PAGE

3) CATALOGUE PAGE: The catalogue page should contain the details of all the books available in the web site in a table.

4) REGISTRATION PAGE

Week 2

Write JavaScript to validate the following fields of the Registration page.

1. **First Name** (Name should contains alphabets and the length should not be less than 6 characters).

2. **Password** (Password should not be less than 6 characters length).
3. **E-mail id** (should not contain any invalid and must follow the standard pattern name@domain.com)
4. **Mobile Number** (Phone number should contain 10 digits only).
5. **Last Name and Address** (should not be Empty).

Week 3

Develop and demonstrate the usage of inline, internal and external style sheet using CSS.

Week 4

Develop and demonstrate JavaScript with POP-UP boxes and functions for the following problems:

- a) Input: Click on Display Date button using onclick() function
Output: Display **date** in the textbox
- b) Input: A number n obtained using **prompt**
Output: **Factorial** of n number using **alert**
- c) Input: A number n obtained using **prompt**
Output: A **multiplication table** of numbers from 1 to 10 of n using **alert**
- d) Input: A number n obtained using **prompt** and add another number using **confirm**
Output: **Sum** of the entire n numbers using **alert**

Week 5

Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next in the list. Add CSS to customize the properties of the font of the capital (color,bold and font size).

Week 6

Write an HTML page including any required JavaScript that takes a number from text field in the range of 0 to 999 and shows it in words. It should not accept four and above digits, alphabets and special characters.

Week 7

Develop and demonstrate PHP Script for the following problems:

- a) Write a PHP Script to find out the Sum of the Individual Digits.
- b) Write a PHP Script to check whether the given number is Palindrome or not

Week 8

Create an XML document that contains 10 users information. Write a Java Program, which takes User Id as input and returns the user details by taking the user information from XML document using DOM parser or SAX parser.

Week 9

Implement the following web applications using (a) PHP, (b) Servlets and (c) JSP.

(i) A web application that takes a name as input and on submit it shows a hello <name> page where name is taken from the request. It shows the start time at the right top corner of the page and provides a logout button. On clicking this button, it should show a logout page with Thank You <name > message with the duration of usage (hint: Use session to store name and time).

(ii) Write a PHP Program to display current Date, Time and Day.

(iii) A web application that takes name and age from an HTML page. If the age is less than 18, it should send a page with "Hello <name>, you are not authorized to visit the site" message, where <name> should be replaced with the entered name. Otherwise it should send "Welcome <name> to this site" message.

(iv) A web application that lists all cookies stored in the browser on clicking "List Cookies" button. Add cookies if necessary.

Week 10

Implement the following web applications with Database using (a) PHP, (b) Servlets and (c) JSP.

Week 11

Modify the above program to use an xml instead of database

Week 12

Write a program to design a simple calculator using (a) JavaScript (b) PHP (c) Servlet and (d) JSP.

TEXT BOOKS:

1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP — Steven Holzner, Tata McGraw-Hill

REFERENCE BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech
2. Java Server Pages —Hans Bergsten, SPD O'Reilly
3. Java Script, D.Flanagan, O'Reilly, SPD.
4. Beginning Web Programming-Jon Duckett WROX.
5. Programming world wide web, R.W.Sebesta, Fourth Edition, Pearson.
6. Internet and World Wide Web — How to program, Dietel and Nieto, Pearson.

Outcomes:

- Use LAMP Stack for web applications
- Use Tomcat Server for Servlets and JSPs
- Write simple applications with Technologies like HTML, Javascript, AJAX, PHP, Servlets and JSPs
- Connect to Database and get results
- Parse XML files using Java (DOM and SAX parsers)

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(R15A0589) SOFTWARE TESTING METHODOLOGY LAB

Objectives:

- This course is designed to enable a clear understanding and knowledge of the foundations, techniques, and tools in the area of software testing and its practice in the industry.
- Whether you are a developer or a tester, you must test software. This course is a unique opportunity to learn strengths and weaknesses of a variety of software testing techniques.

WEEK 1: Introduction to Testing**WEEK 2:** Write a program in C language to demonstrate the working of the following constructs:

- i) Do...while ii) while...do
- iii) If...else iv) switch v) for

WEEK 3: “A program written in C language for matrix multiplication fails” introspect the causes for its failure and write down the possible reasons for its failure.**WEEK 4:** Write atleast 30 test cases to test the functionality of ATM machine**Week 5:** Banking application test cases**Week 6:** Prepare a test case document to test Library management system manually**Week 7:** Study of any testing tool (Win runner)**Week 8:** Study of any web testing tool (Selenium)**Week 9:** Study of any bug tracking tool (Bugzilla, Bugbit)**Week 10:** Study of any test management tool(Test Director)**Week 11:** a) Study of any open source testing tool (Test Link)

b) Test Facebook manually (beyond the syllabus)

Week 12: Take a mini project and execute it. During SDLC create the various UML diagrams required for designing and all testing documents like test plan, TCD etc**Outcomes:**

1. The students understands the process to be followed in the software development life cycle
2. Finds practical solutions to the problems
3. Manage a project from beginning to end
4. Define, formulate and analyze a problem

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(R15A0526) DATA WAREHOUSING AND DATA MINING**Objectives:**

Study data warehouse principles and its working learn data mining concepts understand association rules mining. Discuss classification algorithms learn how data is grouped using clustering techniques.

UNIT-I

Data warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction-Transformation-Loading, Logical(Multi-Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact-Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture-ROLAP, MOLAP and HOLAP.

UNIT-II

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or Data Warehouse System, Major issues in Data Mining.

Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration & Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT-III

Association Rules: Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIORI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set- Maximal Frequent Item Set, Closed Frequent Item Set.

UNIT-IV

Classification: Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers , Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction ; Naive-Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics.

Prediction: Accuracy and Error measures. Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods

UNIT-V

Cluster Analysis : Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model based Clustering Methods, Outlier Analysis.

TEXT BOOKS:

1) Data Mining- Concepts and -1.chniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006.

2) Introduction to Data Mining, Psng-Ning Tan, Vipin Kumar, Michael Steinbanch, Pearson Educator.

REFERENCE BOOKS:

- 1) Data Mining Techniques, Arun KPujari, 3rd Edition, Universities Press.
- 2) Data Warehousing Fundament's, Pualraj Ponnaiah, Wiley Student Edition.
- 3) The Data Warehouse Life CycleToolkit — Ralph Kimball, Wiley Student Edition.
- 4) Data Mining, Vikaram Pudi, P Rddha Krishna, Oxford University Press

Outcomes:

- Student should be able to understand why the data warehouse in addition to database systems.
- Ability to perform the pre-processing of data and apply mining techniques on it.
- Ability to identify the association rules, classification and clusters in large data sets.
- Ability to solve real world problems in business and scientific information using data mining

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(R15A0527) LINUX PROGRAMMING**Objectives:**

- To develop the skills necessary for Unix systems programming including file system programming, process and signal management, and interprocess communication.
- To make effective use of Unix utilities and Shell scripting language such as bash.
- To develop the basic skills required to write network programs using Sockets.

UNIT I

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.

Sed-Scripts, Operation, Addresses, Commands, Applications, awk- Execution, Fields and Records, Scripts, Operation, Patterns, Actions, Associative Arrays, String and Mathematical functions, System commands in awk, Applications.

Shell programming with Bourne again shell(bash)- Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT II

Files and Directories- File Concept, File types, File System Structure, file metadata-Inodes, kernel support for files, system calls for file I/O operations- open, create, read, write, close, lseek, dup2,file status information-stat family, file and record locking-lockf and fcntl functions, file permissions - chmod, fchmod, file ownership-chown, lchown, fchown, links-soft links and hard links – symlink, link, unlink. Directories-Creating, removing and changing Directories-mkdir, rmdir, chdir, obtaining current working directory-getcwd, Directory contents, Scanning Directories-opendir, readdir, closedir, rewinddir, seekdir, telldir functions.

UNIT III

Process – Process concept, Kernel support for process, process identification, process hierarchy, process states, process control - process creation, waiting for a process, process termination, zombie process, orphan process, system call interface for process management-fork, vfork, exit, wait, waitpid, exec family, system, I/O redirection

Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.

UNIT IV

Interprocess Communication - Introduction to IPC, IPC between processes on a single computer system,IPC between processes on different systems, pipes-creation, IPC between related processes using unnamed pipes, FIFOs-creation, IPC between unrelated processes

using FIFOs (Named pipes), differences between unnamed and named pipes, popen and pclose library functions.

Message Queues- Kernel support for messages, APIs for message queues, client/server example.

Semaphores-Kernel support for semaphores, APIs for semaphores, file locking with semaphores.

UNIT V

Shared Memory- Kernel support for shared memory, APIs for shared memory, shared memory example.

Sockets- Introduction to Berkeley Sockets, IPC over a network, Client-Server model, Socket address structures (Unix domain and Internet domain), Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs-Single Server-Client connection, Multiple simultaneous clients, Comparison of IPC mechanisms.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH, 2006.
3. Unix Network Programming, W.R.Stevens, PHI

REFERENCE BOOKS:

1. Linux System Programming, Robert Love, O'Reilly, SPD, rp-2007.
2. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson 2003,
3. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson.
4. System Programming with C and Unix, A.Hoover, Pearson.

Outcomes:

- Students will be able to use Linux environment efficiently
- Solve problems using bash for shell scripting
- Work confidently in Unix/Linux environment

IV Year B. Tech. CSE –I Sem

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(R15A0528) DESIGN PATTERNS**Objectives:**

- Design patterns are a systematic approach that focus and describe abstract systems of interaction between classes, objects, and communication flow
- Given OO design heuristics, patterns or published guidance, evaluate a design for applicability, reasonableness, and relation to other design criteria.
- Comprehend the nature of design patterns by understanding a small number of examples from different pattern categories, and to be able to apply these patterns in creating an OO design.
- Good knowledge on the documentation effort required for designing the patterns.

UNIT I:

Introduction: What Is a Design Pattern? Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT II:

A Case Study: Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, and Supporting Multiple Look – and - Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary.

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT III:

Structural Pattern Part - I: Adapter, Bridge, and Composite

Structural Pattern Part - II: Decorator, Façade, Flyweight, Proxy.

UNIT IV:

Behavioral Patterns Part - I: Chain of Responsibility, Command, Interpreter, Iterator

Behavioral Patterns Part - II: Mediator, Memento, Observer

UNIT V:

Behavioral Patterns Part – II(cont'd): State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns. What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOK:

1. Design Patterns by Erich Gamma, Pearson Education

References:

1. Pattern's in Java Vol-I by Mark Grand, Wiley DreamTech.
2. Pattern's in Java Vol-II by Mark Grand, Wiley DreamTech.
3. Java Enterprise Design Patterns Vol-III by Mark Grand, Wiley DreamTech.
4. Head First Design Patterns by Eric Freeman – Oreilly-spd.
5. Design Patterns Explained by Alan Shalloway, Pearson Education.

Outcomes:

Upon completion of this course, students should be able to:

- Have a deeper knowledge of the principles of object - oriented design
- Understand how these patterns related to object - oriented design.
- Understand the design patterns that are common in software applications.
- Will able to use patterns and have deeper knowledge of patterns.
- Will be able to document good design pattern structures.

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IV Year B. Tech CSE - I Sem

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(R15A0529)Cloud Computing

Objectives:

- To explain the evolving computer model called cloud computing.
- To introduce the various levels of services that can be achieved by cloud.
- To describe the security aspects in cloud.

UNIT- I

Systems Modeling :Distributed System Models and Enabling Technologies- Scalable Computing over the Internet- System Models for Distributed and Cloud Computing- Software Environments for Distributed Systems and Clouds-- Performance, Security, and Energy Efficiency

Computer Clusters for Scalable Parallel Computing: Clustering- Clustering for Massive Parallelism- Computer Clusters and MPP Architectures-Design Principles of Computer Clusters-Cluster Job and Resource Management.

UNIT- II

Virtualization: Virtual Machines and Virtualization of Clusters and Data Centers- Implementation Levels of Virtualization -Virtualization Structures/Tools and Mechanisms-Virtualization of CPU, Memory, and I/O Devices-Virtual Clusters and Resource Management-Virtualization for Data-Center Automation

UNIT- III

Foundations: Introduction to Cloud Computing- Migrating into a Cloud-The Enterprise Cloud Computing Paradigm.

UNIT- IV

Infrastructure as a Service (IAAS) & Platform (PAAS): Virtual machines provisioning and Migration services-On the Management of Virtual machines for Cloud Infrastructures- Aneka—Integration of Private and Public Clouds

UNIT- V

Software as a Service (SAAS) &Data Security in the Cloud:

Google App Engine – Centralizing Email Communications- Collaborating via Web-Based Communication Tools-An Introduction to the idea of Data Security- The Current State of Data Security in the Cloud- Cloud Computing and Data Security Risk- Cloud Computing and Identity.

TEXT BOOKS:

1. Distributed and Cloud Computing, Kaittwang Geoffrey C.Fox and Jack J Dongrra, Elsevier India 2012.

2. Mastering Cloud Computing- Raj Kumar Buyya, Christian Vecchiola and S.TanuraiSelvi, TMH, 2012.
3. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

Outcomes:

- Ability to understand the virtualization and cloud computing concepts.

IV Year B.Tech. CSE -I Sem

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(R15A0530) INFORMATION SECURITY ASSESSMENTS & AUDITS
(SECURITY ANALYST-II)
(Core Elective-III)

Unit I**Information Security Performance Metrics and Audit:**

Security Metrics and Reporting, Common Issues and Variances of Performance Metrics, Introduction to Security Audit, Servers and Storage devices, Infrastructure and Networks, Communication Routes, Information Security Methodologies (Black-box, White-box, Grey-box), Phases of Information Security Audit and Strategies, Ethics of an Information Security Auditor etc.

Maintain Healthy, Safe & Secure Working environment (NOS 9003).

Unit II**Information Security Audit Tasks, Reports and Post Auditing Actions:**

Pre-audit checklist, Information Gathering, Vulnerability Analysis, External Security Audit, Internal Network Security Audit, Firewall Security Audit, IDS Security Auditing, Social Engineering Security Auditing, Web Application Security Auditing, Information Security Audit Deliverables & Writing Report, Result Analysis, Post Auditing Actions, Report Retention etc.

Provide Data/information in Standard formats (NOS 9004).

Unit III**Vulnerability Management:**

Information Security Vulnerabilities — Threats and Vulnerabilities, Human-based Social Engineering, Computer-based Social Engineering, Social Media Countermeasures, Vulnerability Management — Vulnerability Scanning, Testing, Threat management, Remediation etc.

Unit IV**Information Security Assessments:**

Vulnerability Assessment, Classification, Types of Vulnerability Assessment, Vulnerability Assessment Phases, Vulnerability Analysis Stages, Characteristics of a Good Vulnerability Assessment Solutions & Considerations, Vulnerability Assessment Reports — Tools and choosing a right Tool, Information Security Risk Assessment, Risk Treatment, Residual Risk, Risk Acceptance, Risk Management Feedback Loops etc.

Unit V**Configuration Reviews:**

Introduction to Configuration Management, Configuration Management Requirements-Plan-Control, Development of configuration Control Policies, Testing Configuration Management etc.

TEXT BOOKS:

Prescribed books:-

1. Assessing Information Security (strategies, tactics, logic and framework) by A Vladimirov, K.Gavrilenko, and A.Michajlowski
2. The Art of Computer Virus Research and Defense by Peter Szor."

REFERENCES:

1. <https://www.sans.org/reading-room/whitepapers/threats/implementino-vulnerability-management-process34180>
2. <http://csrc.nist.gov/publications/nistpubs/800-40-Ver2/SP800-40v2.odf>

IV Year B.Tech. CSE -I Sem

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(R15A0531) BIG DATA ANALYTICS (ASSOCIATE ANALYTICS – II)**(Core Elective-III)****Unit I:****Data Management (NOS 2101):**

Design Data Architecture and manage the data for analysis, understand various sources of Data like Sensors/signal/GPS etc. Data Management, Data Quality (noise, outliers, missing values, duplicate data) and Data Preprocessing.

Export all the data onto Cloud ex. AWS/Rackspace etc.

Maintain Healthy, Safe & Secure Working Environment (NOS 9003):

Introduction, workplace safety, Report Accidents & Emergencies, Protect health & safety as your work, course conclusion, assessment

Unit II**Big Data Tools (NOS 2101):**

Introduction to Big Data tools like Hadoop, Spark, Impala etc., Data ETL process, Identify gaps in the data and follow-up for decision making.

Provide Data/Information in Standard Formats (NOS 9004):

Introduction, Knowledge Management, Standardized reporting & compliances, Decision Models, course conclusion. Assessment.

Unit III**Big Data Analytics:**

Run descriptives to understand the nature of the available data, collate all the data sources to suffice business requirement, Run descriptive statistics for all the variables and observe the data ranges, Outlier detection and elimination.

Unit IV**Machine Learning Algorithms (NOS 9003):**

Hypothesis testing and determining the multiple analytical methodologies, Train Model on 2/3 sample data using various Statistical/Machine learning algorithms, Test model on 1/3 sample for prediction etc.

Unit V**(NOS 9004)****Data Visualization (NOS 2101):**

Prepare the data for Visualization, Use tools like Tableau, ()lickView and D3, Draw insights out of Visualization tool. Product Implementation

TEXT BOOK

1. **Student's Handbook for Associate Analytics.**

REFERENCE BOOKS:

1. Introduction to Data Mining, Tan, Steinbach and Kumar, Addison Wesley, 2006
2. Data Mining Analysis and Concepts, M. Zaki and W. Meira (the authors have kindly made an online version available): <http://www.dataminingbook.info/uoloads/book.pdf>
3. Mining of Massive Datasets Jure Leskovec Stanford Univ. Anand RajaramanMilliway Labs
Jeffrey D. Ullman Stanford Univ.
4. (<http://www.vistrails.org/index.php/Course: Big Data Analysis>)

IV Year B. Tech. CSE –I Sem

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**(R15A0532) MOBILE COMPUTING
(Core Elective-III)**

Objectives:

- Introduction of an advanced element of learning in the field of wireless communication. Expose the students to the concepts of wireless devices and mobile computing.

UNIT I: Introduction: Mobile Communications, Mobile Computing: Paradigm, Promises/Novel Applications and Impediments and architecture. Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices. GSM: Services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services, GPRS, CSHSD, DECT.

UNIT II: (Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA. MAC Protocols for GSM, Wireless LAN (IEEE802.11) Collision Avoidance (MACA, MACAW) Protocols.

Mobile Network Layer: IP and Mobile IP network Layers, packet delivery, and Handover Management, Location Management Registration, Tunnelling and Encapsulation, Route Optimization, DHCP.

UNIT III: Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

Database Issues: Database Hoarding & Caching techniques, C-S Computing & Adaptation, Transactional Models, Query Processing, Data Recovery Process & QoS Issues.

UNIT IV: Data Dissemination and Synchronization, Communications asymmetry, classification of data delivery mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing Methods, Digital Audio and Video Broadcasting (DAB & DVB). Data Synchronization – Introduction, software, and Protocols.

UNIT V: Mobile Ad hoc Networks (MANETs):

Introduction, Applications & Challenges of a MANET, ROUTING, Classification of routing Algorithms, algorithms such as DSR, AODV, DSDV, etc.. Mobile Agents, Service Discovery. Protocols and Platforms for Mobile Computing WAP, Bluetooth, XML, J2ME, JavaCard, Windows, phone 7, android, Iphone.

TEXT BOOKS:

1. Raj Kamal, "Mobile Computing", oxford University Prwess, 2007, ISBN: 0195686772.

REFERENCE BOOKS:

1. Jochen Schiller, "Mobile Communications, Addison-Wesley, Second Edition, 2004.
2. Stojmenovic and Cacute, "Handbook of wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028.
3. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile.

Applications with UML and XML”, ISBN: 0521817331, Cambridge University Press, October 2004.

Outcomes:

At the end of this course the student should be able

- To understand the concept of mobile computing and architecture of mobile communication.
- Apply the concepts of mobile communications to the transactions and transaction management.
- Apply the concepts of mobile computing and conventional wired network and simulate it on the simulator.
- To understand the working of heterogeneous networks.

IV Year B. Tech. CSE –I Sem

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(R15A0533) COMPUTER FORENSICS
(Core Elective-III)

Objectives:

- A brief explanation of the objective is to provide digital evidences which are obtained from digital media.
- In order to understand the objectives of computer forensics, first of all people have to recognize the different roles computer plays in a certain crime.
- According to a snippet from the United States Security Service, the functions computer has in different kinds of crime.

UNIT-I

Computer Forensics Fundamentals: What is computer Forensics?, Use of computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists

Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement- Computer Forensic Technology- Types of Business Computer Forensic Technology.

Computer Forensics Evidence and Capture: Data recovery Defined- Data Back-up and Recovery- The Role of Back-up and Data Recovery- The Data Recovery Solution

UNIT-II

Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options – Obstacles – Types of Evidence – The Rules of Evidence – Volatile Evidence – General Procedure – Collection and Archiving – Methods of Collection – Artifacts – Collection Steps – Controlling Contamination: The Chain of Custody

Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene – Computer Evidence Processing Steps – Legal Aspects of Collecting and Preserving Computer Forensic Evidence

Computer Image Verification and Authentication: Special needs of Evidential Authentication – Practical Consideration – Practical Implementation

UNIT – III

Computer Forensic analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data – hiding techniques, performing remote acquisitions

Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

Processing Crime and Incident Scenes: Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case

UNIT – VI

Current Computer Forensic tools: evaluating computer forensic tool needs, computer forensic software tools, computer forensic hardware tools, validating and testing forensics software

E – Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools

Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

UNIT – V

Working with Windows and DOS Systems: understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines.

TEXT BOOKS:

1. Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
2. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning

REFERENCE BOOKS:

1. Real Digital Forensics by Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Addison – Wesley Pearson Education
2. Forensic Compiling. A Tractitioneris Guide by Tony Sammes and Brain Jenkinson, Springer International edition.
3. Computer Evidence Collection & Presentation by Christopher L.T.Brown, Firewall Media.
4. Homeland Security, Techniques & Technologies by Jesus Mena, Firewall Media.
5. Software Forensics Collecting Evidence from the scene of a Digital Crime by Robert M.Slade, TMH 2005
6. Windows Forensics by Chad Steel, Wiley India Edition.

Outcomes:

- Students will understand the usage of computers in forensic and how to use various forensic tools for a wide variety of investigations.
- It gives an opportunity to students to continue their zeal in research in computer forensics

IV Year B. Tech. CSE –I Sem

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(R15A0534) PARALLEL PROCESSING**(Core Elective-IV)****Objectives:**

- To understand the basic concepts in parallel computing architecture
- To be familiar with the taxonomies and parallel programming models
- To be able to identify promising applications of parallel computing
- To develop parallel algorithms & implement prototype parallel programs using MPI & OpenMP
- To evaluate the performance metrics of parallel programs with various measures

UNIT-I**Parallel computing**

parallelism, parallel architecture - scope of parallel computing, parallel programming platform, implicit parallelism, limitations of system memory - physical organization of parallel platforms, communication cost in parallel machines, analytical modelling of parallel programs.

UNIT-II**Parallel algorithm design**

Decomposition techniques, recursive, data, explorative, speculative, hybrid - tasks and interaction, characteristics, mapping techniques, load balancing, static mapping, dynamic, mapping, interaction overhead, algorithm models - foster's design methodology

UNIT-III**Message passing paradigm**

Principles of programming, Basic building block, send and receive, MPI, Library, Communicators, Examples - circuit satisfiability, functions, compile and run ,topologies and embedding, collective communication, shared memory programming, parallel loops, data parallelism, critical section, functional parallelism

UNIT-IV**Parallel programming**

Sieve of Eratosthenes, sequential algorithm, Data Decomposition, parallel algorithm, analysis - Floyd's Algorithm, Design parallelism, analysis, Matrix Multiplication - Sorting - parallel quicksort, hyper quicksort, regular sampling, Combinatorial search, parallel Backtracking, parallel branch and bound- parallel alpha-beta search, analysis.

UNIT –V**Performance analysis and applications**

Sources of overhead, Performance Metrics, Parallel overhead, speed up, efficiency, cost, Amdahl's law, Asymptotic analysis, GPU computing, Introduction to Parallel Search - Met heuristic Algorithm, Principles, Parallel Models, Design of GPU based algorithm, Parallelisation control, Memory management, Application to TSP, Comparison, Execution time approximation, Overview, EMMA method, Comparison, Case Study.

TEXT BOOKS:

1. Ananth Grama, George Karypis, Vipin Kumar, and Anshul Gupta, "Introduction to Parallel Computing", Addison Wesley, Second Edition ,2003
2. Ted G. Lewis and H. El-Rewini, "Introduction to Parallel Computing", Prentice-Hall, 1992

REFERENCES:

1. Ananth Grama, George Karypis, Vipin Kumar, and Anshul Gupta, "Introduction to Parallel Computing", Addison Wesley, Second Edition ,2003
2. M J Quinn, "Parallel Programming in C with MPI and OpenMP ",McGraw-Hill Higher Education, first edition, 2004.
3. D. Kirk and W. Hwu, "Programming Massively Parallel Processors", Snir, Otto, Huss-Lederman, Walker, and Dongarra, MPI The Complete Reference, The MIT Press, 1994
4. Ted G. Lewis and H. El-Rewini, "Introduction to Parallel Computing", Prentice-Hall, 1992
5. Ian Foster, "Designing and Building Parallel Programs", Addison Wesley, 1995
2. Van Luong, Nouredine Melab, and El-Ghazali Talbi, " GPU Computing for Parallel Local Search
3. Metaheuristic Algorithms",IEEE Transactions on Computers, vol. 62, no. 1, pages 173-185,
4. January 2013.
5. Junqing Sun and Gregory D. Peterson,"An Effective Execution

Outcomes:

- Express the need for parallel computing with its issues
- Acquire knowledge to design a parallel algorithm using decomposition and mapping techniques
- Interpret message passing paradigm for a parallel algorithm
- Design a parallel algorithm for an existing sequential problem
- Analyze the complexity and performance metrics of code when parallelization is done

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(R15A0535) SEMANTIC WEB AND SOCIAL NETWORKS**(Core Elective-IV)****Objectives:**

- To learn Web Intelligence
- To learn Knowledge Representation for the Semantic Web
- To learn Ontology Engineering
- To learn Semantic Web Applications, Services and Technology
- To learn Social Network Analysis and semantic web

UNIT –I: Web Intelligence

Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today’s Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT -II: Knowledge Representation for the Semantic Web

Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL), UML, XML/XML Schema.

UNIT-III: Ontology Engineering

Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

UNIT-IV: Semantic Web Applications, Services and Technology

Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base ,XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT-V: .Social Network Analysis and semantic web

What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

TEXT BOOKS:

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley inter science, 2008.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCE BOOKS:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, R.Studer, P.Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
3. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T.Segaran, C.Evans, J.Taylor, O'Reilly, SPD.

Outcomes:

- Ability to understand and knowledge representation for the semantic web
- Ability to create ontology
- Ability to build a blogs and social networks

IV Year B. Tech. CSE –I Sem

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**(R15A0536) ARTIFICIAL INTELLIGENCE
(Core Elective-IV)**

Objectives:

- To familiarize students with Artificial Intelligence techniques for building well-engineered and efficient intelligent systems

UNIT I

Introduction: AI problems, AI Technique, defining problem as a static space search production systems, problem characteristics, production system characteristics. Heuristic Search Techniques: Generate – and – test, hill climbing, Best – First Search, problem reduction, constraint satisfaction, means-ends analysis.

UNIT II

Knowledge Representation: Issues, predicate logic, resolution, representing, knowledge using rules, forward versus Backward reasoning, Matching, control knowledge, weak slot – and – filler structures, semantic nets, frames, strong slot – and – filler structures, conceptual dependency, scripts.

UNIT III

Reasoning Techniques: Nonmonotonic reasoning, Augmenting a problem solver, implementation of depth first search and Breadth first search, statistical reasoning, probability and Bayes theorem, certainty factors and rule-based systems, Bayesian Networks.

UNIT IV

Game Playing: Minimax search, alpha – beta cutoffs, planning system, Goal stack planning, hierarchical planning, understanding, understanding as constraint satisfaction, Waltz algorithm, natural language processing, syntactic processing, Augmented transition Networks, semantic analysis, case grammars.

UNIT V

Learning: Role learning, learning by taking advice, learning in problem solving, learning from examples, Winston’s learning program, Decision trees, perception, vision, speech recognition, Navigation, manipulation, Robot architectures, Expert systems, shell, explanation, knowledge acquisition.

TEXT BOOK:

1. “Artificial Intelligence”, 2nd Edition., E.Rich and K. Knight (TMH).

Outcomes:

- Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.
- Formalize a given problem in the language/framework of different AI methods (e.g., as a search problem, constraint satisfaction problem, planning problem, as a Markov decision process, etc).

- Implement basic AI algorithms (e.g., standard search algorithms or dynamic programming).
- Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports.

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(R15A0590) DATA MINING AND DATA WAREHOUSING LAB**Objectives:**

Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration and Pentaho Business Analytics), Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA), Understand the data sets and data preprocessing, Demonstrate the working of algorithms for data mining tasks such as association rule mining, classification, clustering and regression, Exercise the data mining techniques with varied input values for different parameters.

LIST OF EXPERIMENTS:-

Experiments using Weka & Clementine Tools

1. Data Processing Techniques :
 - (i) Data cleaning (ii) Data transformation - Normalization (iii) Data integration
2. Partitioning - Horizontal, Vertical, Round Robin, Hash based
3. Data Warehouse schemas – star, snowflake, fact constellation
4. Data cube construction – OLAP operations
5. Data Extraction, Transformations & Loading operations
6. Implementation of Attribute oriented induction algorithm
7. Implementation of apriori algorithm
8. Implementation of FP – Growth algorithm
9. Implementation of Decision Tree Induction
10. Calculating Information gain measures
11. Classification of data using Bayesian approach
12. Classification of data using K – nearest neighbour approach
13. Implementation of K – means algorithm
14. Implementation of BIRCH algorithm
15. Implementation of PAM algorithm
16. Implementation of DBSCAN algorithm

Outcomes:

- Ability to add mining algorithms as a component to the existing tools
- Ability to apply mining techniques for realistic data.

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(R15A0591) LINUX PROGRAMMING LAB

Objectives:

- To write shell scripts to solve problems
- To implement some standard Linux utilities such as ls, cp etc using system calls.
- To develop network-based applications using C.

List of Sample Problems:

Week 1:

- Write a Shell Script that accepts a file name, starting and ending line numbers as arguments and displays all lines between the given line numbers.
- Write a shell script that deletes all lines containing the specified word in one or more files supplied as arguments to it.
- Write a shell script that displays a list of all files in the current directory to which the user has read, write and execute permissions.

Week 2:

- Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or directory and reports accordingly. Whenever the argument is a file it reports no of lines present in it
- Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.

Week 3:

Write a shell script to list all of the directory files in a directory
Write a shell script to find factorial of a given number.

Week 4:

Write an awk script to count number of lines in a file that does not contain vowels
Write an awk script to find the no of characters ,words and lines in a file

Week 5:

Implement in c language the following Unix commands using system calls
a) cat b) ls c)mv

Week 6:

Write a C program that takes one or more file/directory names as command line input and reports following information

- | | |
|------------------------|--|
| A) File Type | B) Number Of Links |
| C) Time of last Access | D) Read, write and execute permissions |

Week 7:

Write a C program to list every file in directory, its inode number and file name

Week 8:

- a) Write a C program to create child process and allow parent process to display “parent” and the child to display “child” on the screen
- b) Write a C program to create zombie process
- c) Write a C program to illustrate how an orphan process is created

Week 9:

- a) Write a C program that illustrate communication between two unrelated process using named pipes
- b) Write a C program that receives a message from message queue and display them

Week 10:

- a) Write a C program to allow cooperating process to lock a resource for exclusive use using Semaphore
- b) Write a C program that illustrate the suspending and resuming process using signal
- c) Write a C program that implements producer –consumer system with two processes using semaphores

Week 11:

Write client server programs using c for interaction between server and client process using Unix Domain sockets

Week 12:

Write a C program that illustrates two processes communicating using Shared memory

Outcomes:

- Ability to understand the Linux environment
- Ability to perform the file management and multiple tasks using shell scripts in Linux environment.

IV Year B.Tech. CSE -II Sem

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**(R15A0537) INFORMATION SECURITY INCIDENT RESPONSE & MANAGEMENT
(SECURITY ANALYST-III)
(Core Elective-V)**

Unit I

Managing Information Security Services:

Configuring Network Devices, Identifying Unauthorized Devices, Testing the Traffic Filtering Devices, Configuring Router, Configuring Modes — Router/Global/Interface/Line/Privilege EXEC/ROM/User EXEC, Configuring a banner/Firewall/Bastion Host/JVPN server etc.

Unit II

Troubleshooting Network Devices and Services:

Introduction & Methodology of Troubleshooting, Troubleshooting of Network Communication-Connectivity-Network Devices-Network Slowdowns-Systems-Modems etc.

Unit III

Information Security Incident Management & Data Backup:

Information Security Incident Management overview-Handling-Response, Incident Response Roles and Responsibilities, Incident Response Process etc.

Data Backup introduction, Types of Data Backup and its techniques, Developing an Effective Data Backup Strategy and Plan, Security Policy for Backup Procedures.

Unit IV

Log Correlation:

Computer Security Logs, Configuring & Analyzing Windows Logs, Log Management-Functions & Challenges, Centralized Logging and Architecture, Time Synchronization — NTP/NIST etc.

Develop Knowledge Skill and competences (NOS 9005)

Unit V

Handling Network Security Incidents:

Network Reconnaissance Incidents, Network Scanning Security Incidents, Network Attacks and Security Incidents, Detecting DoS Attack, DoS Response Strategies, Preventing/stopping a DoS Incident etc.

Handling Malicious Code Incidents:

Incident Handling Preparation, Incident Prevention, Detection of Malicious Code, Containment Strategy, Evidence Gathering and Handling, Eradication and Recovery, Recommendations etc. Project.

TEXT BOOKS:

1. Managing Information Security Risks, The Octave Approach by Christopher Alberts, and Audrey Dorofee
2. "Cryptography and Network Security (4th Edition) by (Author) William Stallings."

REFERENCES:

1. <https://www.sans.org/reading-room/whitepapers/incident/security-incident-handling-small-organizations-32979>

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(R15A0538) PREDICTIVE ANALYTICS (ASSOCIATE ANALYTICS III)**(Core Elective-V)****Unit I****Introduction to Predictive Analytics & Linear Regression (NOS 2101):**

What and Why Analytics, Introduction to Tools and Environment, Application of Modeling in Business, Databases & Types of data and variables, Data Modeling Techniques, Missing imputations etc.

Need for Business Modelling, Regression — Concepts, Blue property-assumptions-Least Square Estimation, Variable Rationalization, and Model Building etc.

Unit II**Logistic Regression (NOS 2101):**

Model Theory, Model fit Statistics, Model Conclusion, Analytics applications to various Business Domains etc. Regression Vs Segmentation — Supervised and Unsupervised Learning, Tree Building — Regression, Classification, Over fitting, Pruning and complexity, Multiple Decision Trees etc.

Unit III**Objective Segmentation(NOS 2101):**

Regression Vs Segmentation — Supervised and Unsupervised Learning, Tree Building Regression, Classification, Over fitting, Pruning and complexity, Multiple Decision Trees etc.

Develop Knowledge, Skill and Competences (NOS 9005)

Introduction to Knowledge skills & competences, Training & Development, Learning & Development, Policies and Record keeping, etc.

Unit IV**Time Series Methods /Forecasting, Feature Extraction (NOS 2101):**

Arima, Measures of Forecast Accuracy, STL approach, Extract features from generated model as Height, Average, Energy etc and Analyze for prediction.

Project**Unit V****Working with Documents (NOS 0703):**

Standard Operating Procedures for documentation and knowledge sharing, Defining purpose and scope documents, Understanding structure of documents — case studies, articles, white papers, technical reports, minutes of meeting etc., Style and format, Intellectual Property and Copyright, Document preparation tools — Visio, PowerPoint, Word, Excel etc., Version Control, Accessing and updating corporate knowledge base, Peer review and feedback.

TEXT BOOK:

1. Student's Handbook for Associate Analytics-III.

REFERENCE BOOK:

1. Gareth James • Daniela Witten • Trevor Hastie Robert Tibshirani. An Introduction to Statistical Learning with Applications in R

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**(R15A0539) WEB SERVICES
(Core Elective-V)**

Objectives:

- To Understand the details of web services technologies: SOAP, WSDL, UDDI
- To learn how to implement and deploy web services clients and servers
- To explore interoperability between different frameworks
- To learn basic concepts of SOA.

UNIT I

Evolution and Emergence of Web Services: Evolution of distributed computing, Core distributed computing technologies, client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).

Introduction to Web Services: The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

Web Services Architecture: Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services.

UNIT II

Fundamentals of SOAP: SOAP Message Structure, SOAP Encoding, Encoding of different data types, SOAP message exchange models, SOAP communication and messaging, Java and Axis, Limitations SOAP.

UNIT III

Describing Web Services: WSDL, WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings, WSDL Tools, limitations of WSDL.

UNIT IV

Discovering Web Services: Service discovery, role of service discovery in a SOA, service discovery mechanisms, UDDI: UDDI Registries, uses of UDDI Registry, Programming with UDDI, UDDI data structures, Publishing API, Publishing information to a UDDI Registry, searching information in a UDDI Registry, limitations of UDDI.

UNIT V

Web Services Interoperability: Means of ensuring Interoperability, Overview of .NET, Creating a .NET Client for an Axis Web Services, Creating Java Client for a web service, Challenges in Web Services Interoperability.

Services Security: XML security frame work, Goals of cryptography, Digital Signature, Digital Certificate, XML encryption.

TEXT BOOKS:

1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India, 2008.
2. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education, 2008.
3. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.

REFERENCES:

1. Building Web Services with Java, Second Edition, S. Graham and others, Pearson Edn., 2008.
2. Java web services ,D.A. Chappell and T.Jewell, O'Reilly,SPD.
3. Java Web Services Architecture, McGovern,Sameer Tyagi etal.,Elsevier.
4. Web Services, G. Alonso, F. Casati and others, Springer, 2005.

Outcomes:

- Basic details of WSDL, UDDI, SOAD
- Implement WS client and server with interoperable systems

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(R15A0540) DATABASE SECURITY**(Core Elective-V)****Objectives:**

- To learn the security of databases
- To learn the design techniques of database security
- To learn the secure software design

UNIT- I

Introduction: Introduction to Databases Security Problems in Databases Security Controls Conclusions

Security Models -1: Introduction Access Matrix Model Take-Grant Model Acten Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases

UNIT- II

Security Models -2: Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's Model The Lattice Model for the Flow Control conclusion

Security Mechanisms : Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria

UNIT- III

Security Software Design : Introduction A Methodological Approach to Security Software Design Secure Operating System Design Secure DBMS Design Security Packages Database Security Design

Statistical Database Protection & Intrusion Detection Systems: Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls evaluation Criteria for Control Comparison. Introduction IDES System RETISS System ASES System Discovery

UNIT- IV

Models For The Protection Of New Generation Database Systems -1: Introduction A Model for the Protection of Frame Based Systems A Model for the Protection of Object-Oriented Systems SORION Model for the Protection of Object-Oriented Databases

UNIT- V**Models For The Protection Of New Generation Database Systems -2: A**

Model for the Protection of New Generation Database Systems: the Orion Model Jajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions

TEXT BOOKS:

1. Database Security by Castano *Pearson Edition (1/e)*
2. Database Security and Auditing: Protecting Data Integrity and Accessibility, 1st Edition, Hassan Afyouni, THOMSON Edition.

REFERENCE BOOK:

1. Database security by alfred basta, melissa zgola, CENGAGE learning.

Outcomes:

- Ability to carry out a risk analysis for large database.
- Ability to set up, and maintain the accounts with privileges and roles

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(R15A0541) SCRIPTING LANGUAGES**(Core Elective-VI)****Objectives:**

- The course demonstrates an in depth understanding of the tools and the scripting languages
- Necessary for design and development of applications dealing with Bio- information/ Bio - data. The instructor is advised to discuss examples in the context of Bio-data/ Bio-information application development
- Relevant program capabilities are embedded in the learning outcomes for this course. In meeting these learning outcomes you will gain or improve your capabilities in: Enabling Knowledge: effectively apply knowledge of Perl, Python, PHP and TCL/Tk to new situations and learn from the experience.
- The main objective of this advanced course is assisting Perl programmer or database administrator to compile large programming set. Other tasks include implementing complex data structure, compiling object-oriented programming.
- Incorporate PHP into HTML files, Write basic PHP scripts, Process form input, Write and use functions. The advanced PHP training course further develops the skills of experienced PHP Programmers by introducing them to advanced techniques, tools, and methodologies that can be used to build complex, scalable, PHP applications.
- The goal of this course is to teach students the skills required to write Taylor Control Language (TCL) sequences using fundamental and advanced language features.

UNIT I

Introduction to PERL and Scripting Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages. Web Scripting, and the universe of Scripting Languages. PERL-Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines, advance perl -finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

UNIT II**PHP Basics**

PHP Basics - Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Datatypes, Variables, Constants, expressions, string interpolation, control structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

UNIT III

Advanced PHP Programming

Php and Web Forms, Files, PHP Authentication and Methodologies-Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using

PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World – Translating Websites- Updating Web sites Scripts, Creating the Localization Repository, Translating Files, text, Generate Binary Files, Set the desired language within your scripts, Localizing Dates, Numbers and Times

UNIT IV

TCL –Tk

TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output,

procedures , strings , patterns, files, Advance TCL-eval, source, exec and up level commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface. Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding, Perl-Tk.

UNIT V

Python

Introduction to Python language, python-syntax, statements, functions, Built-in-functions and

Methods, Modules in python, Exception Handling, Integrated Web Applications in Python – Building Small, Efficient Python Web Systems ,Web Application Framework.

TEXT BOOKS:

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.
3. Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications (Dreamtech)

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee
2. and B.Ware (Addison Wesley) Pearson Education.
3. Programming Python, M.Lutz, SPD.
4. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.

5. PHP 5.1, I.Bayross and S.Shah, The X Team, SPD.
6. Core Python Programming, Chun, Pearson Education.
7. Guide to Programming with Python, M.Dawson, Cengage Learning.
8. Perl by Example, E.Quigley, Pearson Education.
9. Programming Perl, Larry Wall, T.Christiansen and J.Orwant, O'Reilly, SPD
10. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
11. PHP and MySQL by Example, E.Quigley, Prentice Hall(Pearson).
12. Perl Power, J.P.Flynt, Cengage Learning.

Outcomes:

- Students will also learn to develop, maintain, and scale the performance of web sites using Smarty templates.
- Student will be able to identify database and environment modifications to use TCL. Develop, debug, test, and execute sequences using the Editor and Runtime Console Support.
- Develop TCL sequences that: Perform process control calculations, manipulate arrays, and access recipes.
- Monitor and access functional elements and access/modify sequence parameters.
- Tk is a platform-independent GUI framework developed for Tcl. From a Tcl shell (tclsh), Tk may be invoked using this command: package requires Tk.

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(R15A0542) STORAGE AREA NETWORKS**(Core Elective-VI)****Objectives:**

- To understand storage area networks characteristics and components.
- To become familiar with the SAN vendors and their products
- To learn Fibre Channel Protocols and how SAN components use them to communicate with each other
- To become familiar with Cisco MDS 9000 Multilayer Directors and Fabric Switches Thoroughly learn Cisco SAN-OS features
- To understand the use of all SAN-OS Commands. Practice variations of SANOS features

UNIT I

Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities.

Hardware and software components of the host environment, Key protocols and concepts used by each component, Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications.

UNIT II

Concept of RAID and its components , Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system.

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

UNIT III

List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between businesscontinuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures.

UNIT IV

Architecture of backup/recovery and the different backup/recovery topologies , replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities.

UNIT V

Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center. Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain .

Virtualization technologies, block-level and file-level virtualization technologies and processes. Case Studies, The technologies described in the course are reinforced with EMC examples of actual solutions. Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

TEXT BOOKS:

1. Information Storage and Management, EMC Corporation, Wiley.

REFERENCES:

1. Storage Networks: The Complete Reference, Robert Spalding, Ta McGraw Hill , Osborne, 2003.
2. Building Storage Networks, Marc Farley, Tata McGraw Hi Osborne, 2001.
3. Storage Area Network Fundamentals, Meeta Gupta, Pearso Education Limited, 2002.

Outcomes:

- Ability to demonstrate the storage area networks and their products
- Ability to provide the mechanisms for the backup/recovery

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(R15A0543) SOFTWARE PROJECT MANAGEMENT

(Core Elective-VI)

Objectives:

- Understanding the specific roles within a software organization as related to project and process management
- Understanding the basic infrastructure competences (e.g., process modeling and measurement)
- Understanding the basic steps of project planning, project management, quality assurance, and process management and their relationships

UNIT-I

Conventional Software Management: The waterfall Model, Conventional Software Management Performance, evolution of Software Economics: software Economics. Pragmatic Software Cost Estimation. Improving Software Economics: Reducing Software Product Size, Improving Software Processes, Improving Team Effectiveness, Improving Automation, Achieving Required Quality, Peer Inspections.

UNIT-II

Conventional And Modern Software Management: Principles of Conventional Software Engineering, Principles of Modern Software Management, Transitioning to an interactive Process, Life Cycle Phases: Engineering and Production Stages Inception, Elaboration, Construction, Transition phases .

UNIT-III

Artifacts of the Process: The Artifact Sets. Management Artifacts, Engineering Artifacts, Programmatic Artifacts. Model Based Software Architectures: A Management Perspective and Technical Perspective.

UNIT-IV

Flows of the Process: Software Process Workflows. Inter Trans Workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic Status Assessments. Interactive Process Planning: Work Breakdown Structures, Planning Guidelines, Cost and Schedule Estimating. Interaction Planning Process, Pragmatic Planning.

UNIT-V

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, and Evolution of Organizations. Process Automation Building Blocks, the Project Environment. Project Control and Process Instrumentation: Server Care Metrics, Management Indicators, Quality Indicators, Life Cycle Expectations Pragmatic Software

Metrics Automation.

Text Books:

1. Walker Rayce, "Software Project Management", 1998, PEA.
2. Henrey, "Software Project Management", Pearson.

Reference Books:

1. Richard H.Thayer." Software Engineering Project Management", 1997, IEEE Computer Society.
2. Shere K.D.: "Software Engineering and Management", 1998, PHI.
3. S.A. Kelkar, "Software Project Management: A Concise Study", PHI.
4. Hughes Cotterell, "Software Project Management", 2e, TMH. 88 5. Kaeron Conway, "Software Project Management from Concept to D

Outcomes:

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

- Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project
- Compare and differentiate organization structures and project structures.
- Implement a project to manage project schedule, expenses and resource with the application of suitable project management tools