



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 INFORMATION TECHNOLOGY

Course Structure & Syllabus

(Batches admitted from the academic year 2017 - 2018)

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 of 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 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

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

S.NO	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX.MARKS	
						Int	Ext
1	R17A0001	ENGLISH	2		2	30	70
2	R17A0021	MATHEMATICS-I	4	1	4	30	70
3	R17A0011	ENGINEERING PHYSICS-I	2	1	2	30	70
4	R17A0013	ENGINEERING CHEMISTRY	3		3	30	70
5	R17A0501	COMPUTER PROGRAMMING WITH C	3		3	30	70
6	R17A0302	ENGINEERING DRAWING	4	3	4	30	70
7	R17A0581	COMPUTER PROGRAMMING LAB	-	3	2	25	50
8	R17A0083	ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB	-	3	2	25	50
9	R17A0081	ENGLISH LANGUAGE COMMUNICATION SKILLS LAB-1	-	3	2	25	50
		TOTAL	18	14	24	255	570

I Year B. Tech (IT) – II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX.MARKS	
						Int	Ext
1	R17A0002	PROFESSIONAL ENGLISH	2		2	30	70
2	R17A0022	MATHEMATICS-II	4	1	4	30	70
3	R17A0012	ENGINEERING PHYSICS-II	2	1	2	30	70
4	R17A0502	OBJECT ORIENTED PROGRAMMING THROUGH C++	3	1	3	30	70
5	R17A0201	ELECTRICAL CIRCUITS	4		4	30	70
6	R17A0014	ENVIRONMENTAL STUDIES	3		3	30	70
7	R17A0582	OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB	-	3	2	25	50
8	R17A0084	IT WORKSHOP/ENGINEERING WORKSHOP	-	3	2	25	50
9	R17A0082	ENGLISH LANGUAGE COMMUNICATION SKILLS LAB-II	-	3	2	25	50
*10	R17A0003	HUMAN VALUES AND SOCIETAL PERSPECTIVES	2	-	-	50	-
		TOTAL	20	12	24	305	570

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

II Year B. Tech (IT) – I Semester (6 Core Subjects + 2 Labs)

S.NO	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R17A0503	MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE	3	-	3	30	70
2	R17A0504	DATA STRUCTURES USING C++	4	1	4	30	70
3	R17A0024	PROBABILITY AND STATISTICS	4	-	4	30	70
4	R17A0401	ELECTRONIC DEVICES AND CIRCUITS	3	1	3	30	70
5	R17A0510	COMPUTER ORGANIZATION	3	1	3	30	70
6	R17A0461	DIGITAL LOGIC DESIGN	3	1	3	30	70
7	R17A0282	ELECTRICAL AND ELECTRONICS LAB	-	3	2	25	50
8	R17A0583	DATA STRUCTURES USING C++ LAB	-	3	2	25	50
9	R17A0004 OR R17A0005	FOREIGN LANGUAGES : FRENCH FOREIGN LANGUAGES : GERMAN	2	-		50	
Total			22	10	24	280	520

II Year B. Tech (IT) – II Semester (5 Core Subjects + 1 Open Elective + 2 Labs)

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R17A0506	FORMAL LANGUAGES AND AUTOMATA THEORY	3	1	3	30	70
2	R17A0507	JAVA PROGRAMMING	4	-	4	30	70
3	R17A0508	DESIGN AND ANALYSIS OF ALGORITHMS	3	1	3	30	70
4	R17A0509	DATABASE MANAGEMENT SYSTEMS	4	-	4	30	70
5	R17A0511	SOFTWARE ENGINEERING	3	1	3	30	70
6	*****	OPEN ELECTIVE 1	3	1	3	30	70
7	R17A0584	DATABASE MANAGEMENT SYSTEMS LAB	-	3	2	25	50
8	R17A0585	JAVA PROGRAMMING LAB	-	3	2	25	50
*9	R17A0006	GENDER SENSITIZATION		3		75	
TOTAL			20	13	24	305	550

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

OPEN ELECTIVE 1

S.NO.	SUBJECT CODE	SUBJECT
1	R17A0451	DIGITAL ELECTRONICS
2	R17A0251	FUNDAMENTAL OF ELECTRICAL MACHINES
3	R17A0551	DATA BASE SYSTEMS
4	R17A0351	ELEMENTS OF MECHANICAL ENGINEERING
5	R17A0352	GREEN ENERGY SYSTEMS
6	R17A0051	INTELLECTUAL PROPERTY RIGHTS

III Year B. Tech (IT) – I Semester (4 Core Subjects+1 Core Electives+1 Open Elective+2 Labs)

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R17A0525	LINUX PROGRAMMING	4	-	4	30	70
2	R17A0513	OPERATING SYSTEMS	4	-	4	30	70
3	R17A0519	WEB TECHNOLOGIES	3	1	3	30	70
4	R17A0514	COMPUTER NETWORKS	3	1	3	30	70
5	R17A0515 R17A1201 R17A1202	CORE ELECTIVE 1 1. ADVANCED COMPUTER ARCHITECTURE 2. AUTOMATA & COMPILER DESIGN 3. NETWORK PROGRAMMING	3	1	3	30	70
6	*****	OPEN ELECTIVE 2	3	-	3	30	70
7	R17A0591	LINUX PROGRAMMING LAB	-	3	2	25	50
8	R17A0588	WEB TECHNOLOGIES LAB	-	3	2	25	50
*9	R17A0007	TECHNICAL COMMUNICATION AND SOFT SKILLS	2	-	-	50	-
TOTAL			22	10	24	280	520

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

OPEN ELECTIVES 2

S.NO.	SUBJECT CODE	SUBJECT
1	R17A0452	INDUSTRIAL ELECTRONICS
2	R17A0453	COMMUNICATION NETWORKS
3	R17A0552	INTRODUCTION TO JAVAPROGRAMMING
4	R17A1251	INTRODUCTION TO SCRIPTING LANGUAGES
5	R17A1252	SOFTWARE PROJECT MANAGEMENT
6	R17A0353	ENTERPRISE RESOURCE PLANNING

III Year B. Tech (IT) – II Semester (4 Core Subjects+1 Core Electives+1 Open Elective+2 Labs)

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R17A0522	DISTRIBUTED SYSTEMS	3	1	3	30	70
2	R17A0518	OBJECT ORIENTED ANALYSIS AND DESIGN	4	-	4	30	70
3	R17A0524	DATA WAREHOUSING AND DATA MINING	4	-	4	30	70
4	R17A0464	EMBEDDED SYSTEMS	3	1	3	30	70
5	R17A0517 R17A0520 R17A1203	CORE ELECTIVE 2 1.COMPUTER GRAPHICS 2. SOFTWARE TESTING METHODOLOGIES 3. INFORMATION SECURITY MANAGEMENT	3	1	3	30	70
6	*****	OPEN ELECTIVE 3	3	-	3	30	70
7	R17A0590	DATA WAREHOUSING AND DATA MINING LAB	-	3	2	25	50
8	R17A0589	CASE TOOLS & SOFTWARE TESTING METHODOLOGIES LAB	-	3	2	25	50
TOTAL			20	10	24	230	520

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

OPEN ELECTIVES 3

S.NO.	SUBJECT CODE	SUBJECT
1	R17A0454	ROBOTICS & AUTOMATION
2	R17A1253	MANAGEMENT INFORMATION SYSTEMS
3	R17A0520	WEB TECHNOLOGIES
4	R17A0553	DATA STRUCTURES
5	R17A0354	NANO TECHNOLOGY
6	R17A0355	TOTAL QUALITY MANAGEMENT

IV Year B. Tech (IT) – I Semester (4 Core Subjects+2 Core Electives +2 Labs)

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX. MARKS	
						INT	EXT
1	R17A1204	ARTIFICIAL INTELLIGENCE	3	1	3	30	70
2	R17A1205	PROGRAMMING FOR APPLICATION DEVELOPMENT	4		4	30	70
3	R17A1206	MOBILE APPLICATION DEVELOPMENT	3	1	3	30	70
4	R17A0527	CLOUD COMPUTING	4	-	4	30	70
5	R17A1207	CORE ELECTIVE 3	3	1	3	30	70
	R17A0528	1. MULTIMEDIA & RICH INTERNET APPLICATIONS					
	R17A1208	2. BIG DATA ANALYTICS					
6	R17A0527	3. INFORMATION SECURITY ASSESSMENTS & AUDITS	3	1	3	30	70
	R17A1209	CORE ELECTIVE 4					
	R17A1210	1 DESIGN PATTERNS					
	R17A0536	2. INFORMATION RETRIEVAL SYSTEMS					
7	R17A1281	3. SOFT COMPUTING					
8	R17A1282	4. COMPUTER FORENSICS					
7	R17A1281	MOBILE APPLICATION DEVELOPMENT LAB	-	3	2	25	50
8	R17A1282	PROGRAMMING FOR APPLICATION DEVELOPMENT LAB	-	3	2	25	50
TOTAL			20	10	24	230	520

IV Year B. Tech (IT) – II Semester (2 Core Electives)

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX. MARKS	
						INT	EXT
1	R17A0539	CORE ELECTIVE 5	4	-	4	30	70
	R17A0537	1. SOFTWARE PROCESS & PROJECT MANAGEMENT					
	R17A1211	2. SEMANTIC WEB AND SOCIAL NETWORKS					
2	R17A0535	3. GRID COMPUTING	4	-	4	30	70
	R17A1212	CORE ELECTIVE 6					
	R17A1213	1. WEB SERVICES					
3	R17A0596	2. E-COMMERCE	-	-	4	-	100
4	R17A0597	3. MIDDLEWARE TECHNOLOGIES	-	6	2	50	-
5	R17A0598	MINI PROJECT	15	-	10	100	200
TOTAL			23	6	24	210	440

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT-I Sem****L T/P/D C****2 - / - / - 2****(R17A0001) 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 provide amateur engineers with the critical faculties necessary in an academic environment, using the theoretical and practical components of English syllabus.
- To upgrade the capability of analyzing of texts from different periods and genres.
- To improve the language proficiency of the students in English with emphasis on LSRW skills to face complex engineering activities at work place.
- To understand the basics of grammar to speak correct English and communicate effectively both formally and informally.

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 text and course content, is prescribed for this semester.

Textbook titled "Epitome of Wisdom", published by Maruthi Publications, Hyderabad.

Unit –I

Chapter entitled 'Mokshagundam Visvesvaraya' from *Epitome of Wisdom*
and

Listening – Conversations – introducing each other, talking about a course

Speaking – Jam sessions

Reading – The Palm Islands

Writing – Writing Paragraphs

Grammar – Conjunctions and Adverbs

Vocabulary – Prefixes and Suffixes

Unit – II

Chapter entitled “Three Days to See” from *Epitome of Wisdom*

and

Listening – Conversations-planning for an outing

Speaking – Telephone Etiquettes

Reading – Physically challenged athletes

Writing – Memo writing

Grammar – Modal Auxiliaries

Vocabulary – Synonyms & antonyms

Unit – III

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

and

Listening – News items

Speaking – Public speaking

Reading – ‘If’ poem

Writing – Letter writing-formal/informal

Grammar – Knowing with questions (Wh –questions,) Question tags

Vocabulary – Similes and Metaphors

Unit – IV

Chapter entitled “The Last Leaf” from *Epitome of Wisdom*

and

Listening – Speech on environmental conservation

Speaking – Group discussion

Reading – Choose how to start your day

Writing – Writing a narrative

Grammar – Prepositions

Vocabulary – Idioms and one-word substitutes

Unit –V

5. Chapter entitled “The Convocation Speech” from *Epitome of Wisdom*

and

Listening – Speech on ‘How do you make a teacher great’?

Speaking – Role plays

Reading – What is meant by entrepreneurship?

Writing – Essay writing

Grammar – Active voice and Passive voice

Vocabulary – Phrasal verbs

* Exercises apart from the text book 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.

OUTCOMES:

- Acquire and apply the critical thought process effectively on complex engineering activities.
- Utilize the analytical capability to comprehend and design any text effortlessly.
- Imbibe the English proficiency to receive clear instructions, make notes and draft letters vividly.
- Identify the basic grammatical structures and its application accurately to communicate with society at large.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT-I Sem**

L	T/P/D	C
4	1 / - / -	4

(R17A0021) MATHEMATICS – I**Objectives:**

To learn

- 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 and concept of eigen values and eigen vectors of a matrix
- The mean value theorems and to understand the concepts geometrically , functions of several variables and optimization of these functions.
- Methods of solving the differential equations of first and higher order ,Newton's law of cooling, Natural growth and decay, bending of beams etc.
- In many engineering fields the physical quantities involved are vector valued functions. Hence the vector calculus aims at basic properties of vector-valued functions and their applications to line, surface and volume integrals.

UNIT - I: Matrix Theory

Introduction to matrices- Rank of 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-Diagonalization of a matrix.

UNIT – II: Differential Calculus

Mean Value Theorems: 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

Introduction to ordinary differential equation - 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: 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).

TEXT BOOKS:

1. "Mathematics – I", special edition-MRCET, McGraw Hill 2017
2. Engineering Mathematics – I by T.K.V Iyenger ,B.Krishna Gandhi and Others ,S Chand Publishers.

REFERENCES:

1. Engineering Mathematics by P. Sivaramakrishna Das, Pearson Publishers.
2. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.

Outcomes:

- After learning the contents 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 identify the type of differential equation and uses the right method to solve the differential equations. Also able to apply the theory of differential equations to the real world problems.
- 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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT-I Sem**

L	T/P/D	C
2	- / 1 / -	2

(R17A0011) ENGINEERING PHYSICS – I**OBJECTIVES:**

- The information in optics is required for engineering technology students to understand wave nature of light for applying accurate measurements by means of optical instruments.
- From the study of quantum and statistical aspects dual behavior of electron and solid state physics can be realized by the engineering students.
- The basic information regarding electrons and holes and their functioning in semiconductors is evident to the students. The semiconductor devices provide basic information for the present communication system

UNIT-I**OPTICS:**

Interference-Coherence-Coherent sources, Constructive and destructive interference. Theory of interference fringes(Expression for band width). Interference in thin films by reflected light, Newton's rings Experiment. Diffraction-Types of diffraction, Difference between interference and diffraction, Fraunhofer's diffraction (Single Slit), Diffraction grating, Polarization, Types of polarization, Double Refraction, Nicol Prism.

UNIT-II**LASERS:**

Characteristics of lasers, Spontaneous and Stimulated emissions, Einstein's Coefficients, Population inversion, Meta stable state, pumping, lasing action, Construction and working of Ruby Laser, Helium-Neon Laser, Semi conductor lasers, Applications of lasers.

FIBER OPTICS:

Construction and Working Principle of an optical fiber, Advantages of optical fibers, Numerical aperture and Acceptance angle, Types of Optical fibers - Mode and Propagation through step and graded index fibers, Optical Fiber Communication System, Attenuation, Applications of optical fibers.

UNIT-III**PRINCIPLES OF QUANTUM MECHANICS:**

Wave nature and particle nature-de Broglie's Hypothesis, GP Thomson's Experiment, Davisson and Germer's experiment, Matter Waves, Heisenberg's uncertainty principle, physical significance of wave function, Schrodinger time-independent wave equation, Particle in One dimensional infinite potential box.

UNIT-IV**ELEMENTS OF STATISTICAL MECHANICS & BAND THEORY OF SOLIDS:**

Micro and Macro states, Maxwell Boltzmann, Bose Einstein, Fermi Dirac Statistical distributions (Qualitative), Density of States, Fermi Energy, Introduction to electron theory of metals, Bloch Theorem (Qualitative), Kronig Penny model(Qualitative), EK curve (Brillouin Zone)-Effective mass of electron, Origin of energy bands in solids, Classification of solids-conductors, semi conductors and insulators.

UNIT-V**SEMICONDUCTOR PHYSICS:**

Types of semi conductors, Carrier concentration and Fermi level of intrinsic and Extrinsic Semiconductors, Hall Effect and applications, Direct and indirect band gap of semiconductors.

SEMICONDUCTOR DEVICES:

Formation of PN junction diode, Energy level diagram of PN junction diode. V-I characteristics of PN junction diode- PN junction diode as LED and Solar cell.

TEXT BOOKS:

1. Engineering Physics - S Mani Naidu- Pearson Publishers.
2. A Text Book of Engineering Physics- P.G. Kshirsagar, Avadhanulu – S.Chand

REFERENCES:

1. Solid State Physics, Kittel- Wiley International.
2. Solid State Physics – AJ DekKer-Macmillan Publishers.
3. Engineering Physics, P.K. Palaniswamy, Scitech Publishers

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

I Year B. Tech IT-I Sem

L	T/P/D	C
3	-/-/-	3

(R17A0013)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.
- 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.

UNIT I: Electrochemistry: Conductance - Specific, Equivalent, Molar conductance and their unit, Applications of Conductance-Conductometric titrations (Acid base and Precipitation titrations); EMF-electrode and electrode potentials; Nernst equation and its applications; Electrochemical cells-Galvanic cell (Daniel cell) and Concentration cell (electrolytic concentration cell); Types of Electrodes-(construction and functioning of Calomel, Quinhydrone and Glass electrodes); determination of P^H using glass electrode; Potentiometric titrations (Acid Base and Redox titrations); electrochemical series and its applications; Numerical problems on conductance.

Batteries: Primary (Lithium cells) and Secondary cells (Lead-Acid cell and Ni-Cd cell); **Fuel cells** - Hydrogen -Oxygen fuel cell and Methanol-Oxygen fuel cell - construction, functioning, advantages and applications.

Unit II: Corrosion and its Control: Causes and effects of corrosion; Theories of corrosion – Chemical corrosion (oxidation corrosion) & Electrochemical corrosion (mechanism of evolution of Hydrogen and Absorption of oxygen); Galvanic 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 (Ni plating) – advantages and applications of electroplating/electroless 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 its vulcanization; **Elastomers**–Buna-S and Butyl rubber; **Conducting polymers:** Polyacetylene-Mechanism of conduction, doping; applications of conducting polymers; **Bio-degradable Polymers:** preparation and applications of Poly vinylacetate and Poly lactic acid.

Lubricants: Characteristics of a good lubricant; Classification with examples; properties of lubricants: viscosity, cloud point, pour point, flash and fire point.

Refractories: Classification of refractories with examples, characteristics of a good refractory and applications of refractories.

Nanomaterials: Introduction and applications of nanomaterials.

UNIT IV: Water and its Treatment:

Hardness of Water: Causes of hardness, types of hardness, units of hardness; determination of hardness of water by EDTA method - numerical problems. Boiler troubles – Scales & Sludges, Priming, Foaming, and Caustic Embrittlement; 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 ozonisation, chlorination (break point chlorination and its significance); Reverse Osmosis.

UNIT V: Fuels

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 – Fixed bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol- Fischer-Tropsch's process: Gaseous fuels - constituents, characteristics and applications of Natural gas, LPG and CNG; Calorific value of fuel – HCV, LCV; Determination of calorific value by Junker's gas calorimeter.

TEXT BOOKS:

1. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company 14th Edition (2013)
2. Engineering Chemistry by B. Rama Devi, Ch. Venkataramana Reddy and R.P. Mani, CENGAGE learning (2016)

REFERENCE BOOKS

1. Engineering Chemistry by M. Thirumala Chary and E. Laxminarayana, Scitech publications (2016).
2. Engineering Chemistry by Bharathi Kumari and Jyotsna Cherukuri, VGS Techno Series (2016).

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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT -I Sem**

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(R17A0501) 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, Arrays with functions , 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 , void pointers, Pointer arithmetic, Pointers to Pointers, Pointers with Arrays, Pointers with Functions, Pointers to functions, Array of pointers, Pointers with Strings. Dynamic Memory Management functions: malloc(), calloc(), realloc() and free()

UNIT-V

Structures and Unions - Introduction, Declaration and Initialization, Structure within a structure, Operations on structures, Array of Structures, Pointer to Structures, Structures with 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 Programming with C" ,special edition-MRCET, Mc Graw Hill Publishers 2017.
2. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT -I Sem**

L	T/P/D	C
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(R17A0302) ENGINEERING DRAWING**UNIT – I**

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

- Polygons – Construction of regular polygons (General Method only)
- Conic Sections (General Method only- Eccentricity Method)
- Cycloid, Epicycloid and Hypocycloid
- Scales-Plain, Diagonal and Vernier

UNIT – II

Orthographic Projection in First Angle only: Principles of Orthographic Projections – Conventions – First and Third Angle projections (Introduction).

Projections of Points. Points in all four quadrants.

Projections of Lines – Parallel and inclined to both planes.

UNIT – III

Projections of Planes: Projection of regular planes, Plane inclined to both reference planes (No conditional problems).

Projections of Solids: Projections of regular solids prism and pyramid inclined to both planes (No conditional problems).

UNIT – IV

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

UNIT – V

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

Basic Principles of ACAD – Demo Only.

TEXT BOOKS:

- Engineering Drawing, Special Edition-MRCET, Mc Graw Hill Publishers 2017.
- Engineering Drawing, N.D. Bhatt
- Engineering Drawing by K.Venu Gopal & V.Prabu Raja New Age Publications.

REFERENCES:

- Engineering drawing – P.J. Shah .S.Chand Publishers.
- Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT -I Sem****L T/P/D C**
- -/3/- 2**(R17A0581) 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:

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

Week 2:

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

Week 3:

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

Week 4:

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

Week 5:

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

Week 6:

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

Week 7:

- a) Write a C program to find both the largest and smallest number in a list of integers.
- b) Write a C Program to Sort the Array in an Ascending Order
- c) 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 `callof()` 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.

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(R17A0083) ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB**ENGINEERING PHYSICS LAB****(Any EIGHT experiments compulsory)****OBJECTIVES**

- The students are exposed to various experimental skills which is very essential for an Engineering student.
- The experiments are selected from various areas of physics like physical optics, Lasers, Fiber optics, Sound, Mechanics, Electricity & Magnetism and Basic Electronics.
- The students are exposed to various tools like Screw gauge, Vernier calipers, and physics.

OUTCOMES

- The student learns the concept of error and its analysis and try formulate new solutions to problems related to engineering physical balance, Spectrometer and Microscope.
- The student develops experimental skills to design new experiments in Engineering that accelerates development of society considering the public health and safety of society.
- Comprehension power of the engineering student increases with exposure to these experiments that helps them to compare the theory and correlate with experiment.

This course on physics lab is designed with 12 experiments in an academic year. It is common to all branches of Engineering in B.Tech 1st year.

LIST OF EXPERIMENTS: (Any Eight experiments compulsory)

1. Dispersive power of the material of a prism - Spectrometer.
2. Wave length of light –Diffraction grating-using laser.
3. Newton's Rings –Radius of curvature of Plano convex lens.
4. Melde's experiment –Transverse and Longitudinal modes.
5. Time Constant of an R-C circuit.
6. L-C-R circuit.
7. Magnetic field along the axis of current carrying coil – Stewart and Gee's method.
8. Study the characteristics of LED.
9. Evaluation of numerical aperture of given fiber.
10. Energy gap of a material of p-n junction.
11. Rigidity modulus of given wire - Torsional pendulum.
12. Characteristics of a Solar cell.

ENGINEERING CHEMISTRY LAB**List of Experiments (Any Eight experiments compulsory)****OBJECTIVES**

This course on chemistry lab is designed with 12 experiments in an academic year. It is common to all branches of Engineering in 1st B.Tech.

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

- Provide the students with a solid foundation in chemistry laboratory required to solve engineering problems.
- Practical implementation of fundamental concepts.

OUTCOMES

- Students are able to estimate the total hardness and alkalinity present in a sample of water.
- Ability to select lubricants for various purposes.
- Ability to determine the surface tension of a given liquid.
- Ability to prepare advanced polymer materials.
- Ability to know the strength of an acid by conduct metric and potentio metric method.
- Ability to find the Fe^{+2} , and Mn^{+2} present in unknown substances/ ores using titrimetric and instrumental methods.

List of Experiments**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

Conductometry:

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

Potentiometry:

7. Titration of strong acid vs strong base by Potentiometry.
8. Titration of weak acid vs strong base by Potentiometry.

Preparation:

9. Preparation of Phenol Formaldehyde Resin(Bakelite)-Demonstration
10. Preparation of Aspirin.

Physical properties:

11. Determination of Viscosity of sample oil by Redwood Viscometer.
12. Determination of Surface Tension of a given liquid by Stalagmometer

TEXT BOOKS:

1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. Inorganic quantitative analysis, Vogel.

REFERENCE BOOKS:

1. Text Book of engineering chemistry by R. N. Goyal and HarrmendraGoel, Ane Books Private Ltd.,
2. A text book on experiments and calculation Engg. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

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(R17A0081) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB – I

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

Objective:

- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitize 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, ample speaking opportunities are provided.
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussions and public speaking

Syllabus: English Language Communication Skills Lab has 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

UNIT –I

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

ICS Lab: Ice-Breaking activity - JAM session

UNIT –II

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

ICS Lab: Situational Dialogues/Role Plays – Informal

UNIT -III

CALL Lab: Syllable and Syllabification

ICS Lab: Situational Dialogues/Role Plays – Formal

WORKSHEETS FOR LETTER WRITING**ELCS Lab:****1. Computer Assisted Language Learning (CALL) Lab:**

The Computer aided Language Lab for 60 students with 60 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 :

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.

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 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 other institution.

OUTCOMES:

- Learning with precision through computer-assisted individualized and independent language learning to work independently in engineering set up.
- Improved conversational reception and articulation techniques in the course of repetitive instruction thereby gaining confidence both in institutional and professional environment.
- Accuracy in pronunciation and restoring Standard English thereby crafting better command in English language so that the students have a cutting edge over others in society.
- Imbibing appropriate use of language in situations to work as an individual and as a leader in diverse teams

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(R17A0002) 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:

- Provide amateur engineers with the critical faculties necessary in an academic environment, using the theoretical and practical components of English syllabus.
- Upgrade the capability of analyzing of texts from different periods and genres.
- Improve the language proficiency of the students in English with emphasis on LSRW skills to face complex engineering activities at work place.
- Understand the basics of grammar to speak correct English and communicate effectively both formally and informally.

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 text and course content is prescribed.

Text book entitled "Skills Annexe: Functional English for Success", published by Orient Black Swan, Hyderabad.

UNIT-I

Chapter entitled "Of parents and children" from "*The essays of Francis Bacon*", paperback-Import, 11 Oct 2008.

and

Listening – Listening for the theme and gist

Speaking – Describing situations and objects

Reading – Why pure science in India lags behind? – By P Rajendran

Writing – Note-taking and Note-making

Grammar – Nouns and Articles

Vocabulary – Homonyms, Homographs, Homophones

Unit –II

Chapter entitled “Sachin Tendulkar” from *Skills Annexe -Functional English for Success*,

and

Listening – listening for opinions

Speaking – Project Oral Presentations

Reading – Benefits of physical activity

Writing – Report writing

Grammar – Common Errors

Vocabulary –Technical Vocabulary

Unit –III

Job applications: Cover letter & Curriculum vitae

and

Listening – listening for main and sub-points

Speaking –Giving directions and instructions

Reading – Editorial letters from newspapers

Writing –Formal letter writing

Grammar – Tenses

Vocabulary – Collocations

Unit – IV

Chapter entitled “Human Values and Professional Ethics” from *Skills Annexe -Functional English for Success*

and

Listening – Listening for details

Speaking – Talking about hypothetical situations

Reading – What I Cherish Most

Writing – E-mail writing

Grammar – Types of verbs: Transitive, Intransitive, Ergative, finite and non – finite

Vocabulary – Commonly confused words

Unit – V

Chapter entitled “The fringe benefits of failure and the importance of imagination” a speech by J.K. Rowlings

and

Listening – listening for information

Speaking – Oral Presentations

Reading – The one thing every business executive must understand about social media

Writing –Picture composition

Grammar – Concord

Vocabulary –Commonly misspelt Words

* Exercises apart from the text book 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.

OUTCOMES:

- Acquire and apply the critical thought process effectively on complex engineering activities.
- Utilize the analytical capability to comprehend and design any text effortlessly.
- Imbibe the English proficiency to receive clear instructions, make notes and draft letters vividly.
- Identify the basic grammatical structures and its application accurately to communicate with society at large.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B.Tech IT -II SEM**

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(R17A0022)MATHEMATICS-II**Objectives**

- The objective of interpolation is to find an unknown function which approximates the given data points and 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.
- 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.
- Properties of Laplace Transform, Inverse Laplace Transform and Convolution theorem

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

Solution of Algebraic and Transcendental Equations: Introduction – Graphical interpretation of solution of equations. The Bisection Method – Regula-Falsi Method – 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

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 and Applications of PDE to one dimensional (Heat equation).

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. Mathematics-II, Special edition MRCET, Mc Graw Hill Publishers-2017.
- 2.1. Mathematical Methods by T.K.V Iyenger ,B.Krishna Gandhi and Others ,S Chand.

REFERENCES:

1. Introductory Methods by Numerical Analysis by S.S. Sastry, PHI Learning Pvt. Ltd.
2. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.

OUTCOMES:

- From a given discrete data, one will be able to predict the value of the data at an intermediate point and 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.
- The student will be able to find a root of a given equation and will be able to find a numerical solution for a given differential equation. Helps in describing the system by an ODE, if possible. Also, suggests to find the solution as a first approximation.
- One will be able to find the expansion of a given function by Fourier series.
- 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 is able to solve certain differential equations using Laplace Transform. Also able to transform functions on time domain to frequency domain using Laplace transforms

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B.Tech IT -II SEM**

L	T/P/D	C
2	-/1/-	2

(R17A0012) 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:

Space lattice, Basis, Unit cell, lattice parameters, Crystal systems, Bravais lattices, Atomic number, coordination number, packing factor of SC,BCC,FCC crystals, Crystal planes and directions - Miller indices. Expression for inter planar distance in cubic crystal, Structure of NaCl and Diamond.

UNIT- II**X-RAY DIFFRACTION:**

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

DEFECTS IN CRYSTALS:

Classification of crystal defects, Point defects-Vacancies & Interstitials, 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, Internal fields in dielectrics, Classius Mosotti relation, Piezo electricity and Ferro electricity, Applications of dielectric materials.

UNIT-IV**MAGNETIC PROPERTIES:**

Magnetic permeability, Field intensity, Magnetic field induction, Magnetization, Magnetic susceptibility, Origin of 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, Properties of super conductors, Meissner effect, Types –I Type-II 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, Bottom up Fabrication- Sol gel ,Top down Fabrication- Physical Vapour Deposition, Characterisation of Nano particles –TEM and SEM, Applications of Nano materials.

TEXT BOOKS:

1. Engineering Physics - S Mani Naidu- Pearson Publishers.
2. A Text Book of Engineering Physics- P.G. Kshirsagar, Avadhanulu – S.Chand

REFERENCES:

1. Solid State Physics, Kittel- Wiley International.
2. Solid State Physics – AJ DekKer-Macmillan Publishers.
3. Engineering Physics, P.K. Palaniswamy, Scitech Publishers

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 helps the student to develop problem solving skills and analytical skills.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

I Year B.Tech IT-II SEM

L T/P/D C

3 1/-/- 3

(R17A0502) OBJECT ORIENTED PROGRAMMING THROUGH C++**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 - differences between Object Oriented Programming and Procedure oriented programming, Basic concepts of Object Oriented Programming, Encapsulation, Inheritance and Polymorphism. Benefits of OOP. Structure of a C++ program, 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, 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, Constructors in Derived Classes.

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, Abstract Classes, Virtual Base Classes, Virtual Destructors. Function Overloading, Operator overloading, Rules for Operator overloading, overloading of binary and unary operators .

Unit-V**Templates and Exception handling:**

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

Exception handling:

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

TEXT BOOKS:

1. Object Oriented Programming with C++, special edition MRCET, Tata Mc Graw Hill Publishers-2017.
2. Object Oriented Programming with C++ by Balagurusamy.

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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B.Tech IT -II SEM****L T/P/D C****4 -/-/ - 4****(R17A0201)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 magnetic circuits.

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 Millman's theorems.

Unit –V: MAGNETIC CIRCUITS:

Faraday's laws of electromagnetic induction, concept of self and mutual inductance, dot convention, coefficient of coupling, composite magnetic circuit, analysis of series and parallel magnetic circuits.

TEXT BOOKS:

1. Electrical Circuits ,Special edition MRCET- Mc Graw Hill Publishers 2017
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,RohitMehta,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, magnetic circuits with which he/she can able to apply the above conceptual things to real-world problems and applications

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B.Tech. IT - II Sem**

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3	-/-/-	3

(R17A0014)ENVIRONMENTAL STUDIES**Objectives:**

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

UNIT-I:**Introduction:** Definition of Environment and multidisciplinary nature of environmental sciences.**Ecosystems:** Definition, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles (Carbon, Nitrogen, Water cycle) Bioaccumulation and Biomagnification with examples.**UNIT-II:****Natural Resources:** Classification of Resources: water resources: types: surface and ground water and over utilization effects of ground water. Dams: benefits and problems. Forest resources: functions, causes and effects of Deforestation, Energy resources: renewable and non-renewable energy sources, use of alternate energy resources.**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. 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, sources, causes, effects and control measures **Water pollution:** Sources and types of pollution, causes and effects, water treatment methods. **Soil Pollution:** Sources and types, Impacts of modern agriculture. Solid waste management, e-Waste management.**Global Environmental Problems:** Green house effect, Global warming, Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS).**UNIT-V:****Environmental Policy, Legislation & EIA:** Environmental Protection act 1986, Air act 1981, Forest conservation act 1980, Biomedical 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, threats and strategies of Sustainable Development, Environmental Education.**TEXT BOOKS:**

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

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. Cunnningham& Mary Inn Cunnningham 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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B.Tech. IT- II Sem****L T/P/D C
- / 3 / - 2****(R17A0582)OBJECT ORIENTED PROGRAMMING THROUGH C++ 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:

Basic C++ Programs

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 Program 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:

- a) Reading a matrix. b) Addition of matrices. c) Printing a matrix.
d) Subtraction of matrices. e) Multiplication of matrices

Week 10

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

- a)Single inheritance
b)Multiple inheritance
c)Multi level inheritance
d)Hierarchical inheritance

Week 11

- a.) 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.
- b) 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.
- 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.

Week 13

- Write a Program Containing a Possible Exception. Use a Try Block to Throw it and a Catch Block to Handle it Properly.
- Write a Program to Demonstrate the Catching of All Exceptions.

Week 14

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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT -II Sem****L T/P/D C**
- -/3/- 2**(R17A0084) IT WORKSHOP / ENGINEERING WORKSHOP****OBJECTIVES:**

The IT Workshop for engineers is a training lab course spread over 54 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel and Power Point.

PC HARDWARE**Week 1:**

Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral

Week 2:

- i. Every student should individually install MS windows on the personal computer.
- ii. Basic DOS Commands

Week 3:

- a) Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals
- b) Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

INTERNET & WEB BROWSERS**Week 4:**

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers And How to access the websites and email& Search Engines & various threats on the internet and would be asked to configure their computer to be safe on the internet, Antivirus downloads to avoid viruses and/or worms.

MS OFFICE**Week 5:**

- a) Word Orientation: an overview of Microsoft (MS) office 2007/ 10: Importance of MS office 2007/10, overview of toolbars, saving files, Using help and resources, rulers, format painter. Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.
- b) Using 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 in Word &Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

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

2. 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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT -II Sem**

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(R17A0082) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB- II

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

Objectives:

- To make students acquire language skills at their own pace with the usage of authentic learning environment through different media, e-materials and language lab.
- To make learners acquire listening and speaking skills in both formal and informal contexts through diverse interactive sessions and computer aided multi-media training.
- To impart nuances of linguistics to help novices to resolve mother tongue interference by ensuring precision in pronunciation to benefit Standard English.
- To help develop the students communication skills by familiarizing them with different strategies to suit academic as well as workplace contexts.

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 –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

ICS Lab: Etiquette – Professional and telephone

Exercise –VI

CALL Lab: Neutralization of Mother Tongue Influence

ICS Lab: Oral Presentations (Team or Individual)

PROJECTS**PROJECTS**

Students have to choose one of the following projects for their External Examinations, and submit before the end of the semester. This project carries 10 marks in the Lab External Examinations.

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:**3. Computer Assisted Language Learning (CALL) Lab:**

The Computer aided Language Lab for 60 students with 60 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

4. Interactive Communication Skills (ICS) 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.

REFERENCES:

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 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 other institution.

OUTCOMES:

- Learning with precision through computer-assisted individualized and independent language learning to work independently in engineering set up.
- Improved conversational reception and articulation techniques in the course of repetitive instruction thereby gaining confidence both in institutional and professional environment.
- Accuracy in pronunciation and restoring Standard English thereby crafting better command in English language so that the students have a cutting edge over others in society.
- Imbibing appropriate use of language in situations to work as an individual and as a leader in diverse teams

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**I Year B. Tech IT -II Sem****L T/ P/ D C****2 -/-/ -****(R17A0003) 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. Animal consciousness vs Human consciousness, Self Exploration -What is it? Its content and process; 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 doer, 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-astitva) of mutually interacting units in all –pervasive space. Holistic perception of harmony at all levels 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.

TEXT 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 Reprin ted 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. Done Ila 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 Govindrajran , 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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(R17A0504) 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:

Algorithms, performance analysis- time complexity and space complexity,

Searching: Linear and binary search methods.

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

UNIT II:

basic data structures- The list ADT, Stack ADT, Queue ADT, array and linked list Implementation using template classes in C++. Trees-Basic terminology Binary Tree ADT, array and linked list Implementation, Binary tree traversals, threaded binary tree.

UNIT III:

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

UNIT IV:

Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

UNIT V:

Search Trees:-Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching.

Graphs: Basic terminology, representation of graphs, graph search methods DFS, BFS

TEXT BOOKS:

1. DATA STRUCTURES USING C++” ,special edition MRCET,McGraw Hill publications 2017
2. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
3. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons.

REFERENCES:

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
2. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

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(R17A0024) PROBABILITY AND STATISTICS**Objectives: To learn**

- 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 -I : Random variable 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 and variance.

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

UNIT -II :Correlation and Regression

Correlation -Coefficient of correlation , Rank correlation, Regression- Regression Coefficients , Lines of Regression.

UNIT -III : 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 -IV : 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-V : Queuing Theory and Stochastic process**Queuing Theory**

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. S Chand 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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(R17A0401) 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, BJT 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. "Electronic Devices And Circuits", special edition-MRCET, TATA McGraw Hill 2017.

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

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

- Understand and Analyse the different types of diodes, operation and its characteristics
- Design and analyse 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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(R17A0510) 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" special edition-MRCET,TATA McGraw Hill. 2017
2. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
3. 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 of Computer Organization and Design, - Sivarama 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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(R17A0461) DIGITAL LOGIC DESIGN**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

Number systems and Boolean algebra: Number systems and base conversion methods complements of numbers, codes – binary codes binary coded decimal code ,unit distance codes error detecting and correcting codes

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

UNIT II**MINIMIZATION TECHNIQUES AND LOGIC GATES**

Introduction Minimization Techniques , Minimization Theorem, Karnaugh map method , 3 ,4 and 5 variable maps prime and essential implications don't care map entries using the map for simplifying ,Quine-McCluskey methods,multilevel NAND/NOR realizations.

UNIT III**COMBINATIONAL CIRCUITS**

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

UNIT IV**SEQUENTIAL CIRCUITS**

Introduction ,basic architectural dictions between combinational and sequential circuits Latches, Flip-flops ,SR, JK, D, T, and Master-Slave, Characteristic table and equation , Conversion of one flip flop using other flip flops .

counters : Design of single mode counter, ripple counter ,ring counter, shift registers , ring counter using shift registers

UNIT V**MEMORY DEVICES**

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.

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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- - / 3 / - 2**(R17A0282)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).

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(R17A0583) DATA STRUCTURES USING C++ LAB**Objectives:**

- To make the student learn a object oriented way of solving problems.
- To make the student write ADTS for all data structures.

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- C++ compiler and STL Recommended

Week1:

Write C++ programs to implement recursive and non recursive i) Linear search ii) Binary search

Week2:

Write C++ programs to implement i) Bubble sort ii) Selection sort iii) quick sort iv) insertion sort

Week3:

Write C++ programs to implement the following using an array.

- a) Stack ADT b) Queue ADT

Week4:

Write C++ programs to implement list ADT to perform following operations

- Insert an element into a list.
- Delete an element from list
- Search for a key element in list
- count number of nodes in list

Week5:

Write C++ programs to implement the following using a singly linked list.

- a)Stack ADT b) Queue ADT

Week6:

Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.

Week 7:

Write a C++ program to perform the following operations:

- Insert an element into a binary search tree.
- Delete an element from a binary search tree.
- Search for a key element in a binary search tree.

Week8:

Write C++ programs for implementing the following sorting methods:

- a) Merge sort b) Heap sort

Week9:

Write C++ programs that use recursive functions to traverse the given binary tree in

- a) Preorder b) inorder and c) postorder.

Week10:

Write a C++ program to perform the following operations

- a) Insertion into a B-tree b) Deletion from a B-tree

Week11:

Write a C++ program to perform the following operations

- a) Insertion into an AVL-tree b) Deletion from an AVL-tree

Week12:

Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

(Note: Use Class Templates in the above Programs)

TEXT BOOKS :

1. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson.
2. Data Structures using C++, D.S. Malik, Thomson

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(R17A0004)FOREIGN LANGUAGE-FRENCH**INTRODUCTION:**

Au vu de l'importance croissante des langues étrangères comme outil de communication dans certains pays du globe, le français a été identifié comme l'une des langues les plus sollicitées après l'anglais. De ce fait, tout en insistant sur la formation en compétences communicatives, le programme a été élaboré pour développer des aptitudes linguistiques et communicatives des étudiants ingénieurs. Le cours de français, sera centré sur les compétences orales de base.

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.

SYLLABUS**UNITE - I:**

- **Objectif communicatifs (LSRW)**
-Se présenter / Présenter quelqu'un - Entrer en contact – Saluer – Epeler - poser des questions - comprendre et remplir un formulaire
- **Grammaire**
- Les formules de politesse
- L'alphabet
- Les nombres de 1 à 30
- Le verbe "être" et "avoir" au présent de l'indicatif
- **Vocabulaire**
- Les professions
- Les nationalités

UNITE - II:

- **Objectif communicatifs (LSRW)**
Parler de sa famille – décrire quelqu'un – exprimer ses goûts et les préférences – écrire et comprendre un message court – compter jusqu'à 100 – exprimer la possession – exprimer la négation
- **Grammaire**
- Les articles
- Les verbes en –er- au présent
- Les noms (genre et nombre)
- Les adjectifs possessifs
- Les adjectifs qualificatifs
- « Qu'est ce que c'est ? » / « Qui est ce ? »/ « c'est... »
- La négation
- **Vocabulaire**
- La famille
- Les vêtements
- Les couleurs
- Les nombres de 1 à 100
- La salle de classe

UNITE - III

- **Objectif communicatifs (LSRW)**

Parler de ses activités quotidiennes – se situer dans le temps – demander et indiquer la date et l’heure – parler des sports et des loisirs – exprimer la fréquence.

- **Grammaire**

- L’expression du temps (l’heure)
- Les verbes en –ir- au présent
- Les verbes faire, aller, prendre, venir,
- Les adverbes
- Les verbes pronominaux

- **Vocabulaire**

- Les jours et les mois de l’année
- La vie quotidienne
- Les sports
- Les loisirs

UNITE - IV

- **Objectif communicatifs (LSRW)**

Exprimer la quantité – demander et donner le prix- exprimer la nécessité, la volonté et la capacité – comparer (adjectif) – s’exprimer au restaurant / dans les magasins

- **Grammaire**

- Pouvoir, vouloir, il faut
- Exprimer la capacité / la possibilité
- Exprimer la volonté / le désir
- Le futur proche

- **Vocabulaire**

- La nourriture
- Les repas
- Les fruits et légumes
- Les parties du corps

UNITE - V

- **Objectif communicatifs (LSRW)**

Exprimer l’interdiction et l’obligation- décrire un appartement – parler du temps qu’il fait / demander le temps qu’il fait – demander l’opinion – donner son avis – exprimer son accord ou son désaccord

- **Grammaire**

- Les adjectifs démonstratifs
- Les prépositions
- Le verbe ‘devoir’ et ‘falloir’ au présent
- « Il y a » et « Depuis »

- **Vocabulaire**

- Les saisons
- Les vacances
- La ville
- Le logement

REFERENCE BOOKS:

1. Apprenons le Français 1& 2, New Saraswati House, 2015|
2. A propos, A1, Langers International, 2010
3. Easy French Step-by-step by Myrna Bell Rochester-
4. Ultimate French Beginner-Intermediate (Coursebook) By Livid Language
5. À L'Aventure: An Introduction to French Language and Francophone Cultures By 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.

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(R17A0005) 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.

SYLLABUS:**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

1. Lernziel Deutsch

Reference books:

2. Themen
3. Tangram
4. Sprachkurs Deutsch
5. 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.

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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.

LINEAR BOUNDED AUTOMATA(LBA):LBA,context sensitive grammars ,CS languages

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. & Papadimitiou 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

Course 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.

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(R15A0507)JAVA PROGRAMMING**Objectives:**

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).

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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 deadlines, 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 design DBMS and explain its significance in IT projects
- To design ER diagrams
- To develop RDBMS relation schemas from ER diagrams
- To develop queries for user required screens and reports and develop SQLs
- To develop concurrent queries and optimize them using queries manually

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.

Course Outcomes:

- Student can define ER model for mini and main projects
- Student can develop RDBMS relation schemas from ER diagrams
- Student can develop queries required
- Student can develop concurrent queries and optimize them using queries manually

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(R15A0511)SOFTWARE ENGINEERING**Objectives:**

- To understanding of software process models such as waterfall and evolutionary models.
- To understanding of software requirements and SRS document.
- To understanding of different software design and architectural styles.
- To understanding of software testing approaches such as unit testing and integration testing.
- To understanding on 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.

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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, which 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

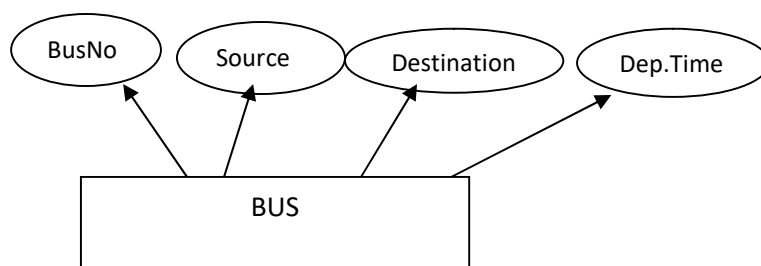
Relationships:

1. Reservation
2. Cancellation

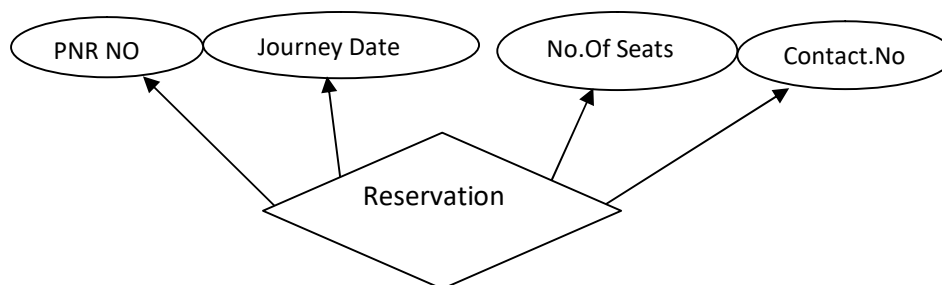
PRIMARY KEY ATTRIBUTES:

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>
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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>
------	-----	-----	---------	--------------------

<u>Passport_id</u>	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.Ticket NO > 60 THEN SET New.Ticket 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.

Course 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**Course 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:

1. Able to analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fundamental concepts in OOP.
2. Demonstrate an ability to design and develop java programs, analyze, and interpret object oriented data and report results.
3. Demonstrate an ability to design an object oriented system, AWT components or multithreaded process as per needs and specifications.
4. 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 Bhargubanda, 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: 600BC 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 My Life...and Won." Available online at: <http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulali/>
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.

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3	-/-/-	3

OPEN ELECTIVE - I
(R17A0451) DIGITAL ELECTRONICS

OBJECTIVES:

The main objectives of the course are:

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

UNIT I**BINARY SYSTEMS AND LOGIC GATES:**

Binary Systems: The Advantage of Binary, Number Systems, The Use of Binary in Digital Systems, AND, OR, NOT, NAND, NOR, Exclusive-OR, Exclusive-NOR and Exclusive-NAND implementations of Logic Functions using gates, NAND-NOR implementations.

UNIT II**MINIMIZATION TECHNIQUES:**

Minimization Techniques: Boolean postulates and laws-De-Morgan's Theorem-Principle of Duality-Boolean expression-Minimization of Boolean expressions-Minterm-Maxterm-Sum of Products (SOP)-Product of Sums (POS)-Karnaugh map minimization-Don't care conditions-Quine Mc-Cluskey method of minimization.

UNIT III**COMBINATIONAL CIRCUITS:**

Design Procedure-Half Adder-Full Adder-Half Subtractor-Full Subtractor-Parallel binary adder-Parallel Binary Subtractor-Multiplexer/ Demultiplexer-Decoder-Encoder.

UNIT IV**SEQUENTIAL CIRCUITS:**

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 Counter-Asynchronous Up/Down Counter, Decade counter-Synchronous Counters-Synchronous Up/Down Counters, Decade Counters

UNIT V**MEMORY DEVICES:**

Classification of Memories-ROM_ROM Organization, PROM-EPROM-EEPROM-EAPROM, RAM-RAM Organization-Write operation-Read Operation-Programmable Logic Devices-Programmable Logic Array (PLA), Programmable Array Logic (PAL)-Implementation of combinational logic circuits using ROM, PLA, PAL.

OUTCOMES

After the completion of the course, the student will be able to:

1. Analyse different methods used for simplification of Boolean expressions
2. Design and implement Combinational and Sequential circuits.
3. Design and implement Synchronous and Asynchronous Sequential Circuits.

TEXT BOOK:

1. M Morris Mano, "Digital Design", 4th Edition, Prentice Hall of India Pvt., Ltd., 2008/Pearson Education (Singapore) Pvt., Ltd., New Delhi, 2003.
2. Donald P Leach and Albert Paul Malvino, "Digital Principles and Applications", 6th Edition, TMH, 2006.

REFERENCES:

1. John F Wakerly. "Digital Design, Fourth Edition, Pearson/PHI, 2008
2. John M Yarbrough, "Digital Logic Applications and Design", Thomson Learning, 2006
3. Charles H Roth, "Fundamentals of Logic Design", 6th Edition, Thomson Learning, 2013
4. Thomas L Floyd, "Digital Fundamentals", 10th Edition, Pearson Education Inc, 2011.
5. Donald D Givone, "Digital Principles and Design", TMH, 2003.

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OPEN ELECTIVE - I**(R17A0251) ELEMENTS OF ELECTRICAL ENGINEERING****OBJECTIVES:**

1. To introduce the fundamental concepts of electromechanical energy conversion
2. To familiarize the students with the principle of operation, constructional features and operational characteristics of various types of Motors used in the engineering and consumer Industry

UNIT – I

Electromechanical Energy Conversion: Electromechanical Energy conversion – forces and torque in magnetic field systems – energy balance – energy and force in a singly excited magnetic field system, determination of magnetic force - co-energy – multi excited magnetic field systems.

UNIT – II**D.C. Generators & Motors :**

D.C. Generators – Principle of operation – Action of commutator – constructional features – armature windings — simplex and multiplex windings – use of laminated armature – E. M.F Equation

D.C. Motors: Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation.

Speed control of DC Motors: Armature voltage and field flux control methods. Ward-Leonard system. – protective devices.

UNIT – III:**Single Phase Transformers:**

Single phase transformers-principle of operation-constructional details- types-emf equation-equivalent circuit – operation on no load and on load-phasor diagrams –losses- minimization of hysteresis and eddy current losses-efficiency-all day efficiency-regulation-effect of variations of frequency and supply voltage on iron losses.

UNIT – IV:**Polyphase Induction Motors & Their Speed control**

Polyphase induction motors: construction details of cage and wound rotor machines-production of a rotating magnetic field – principle of operation – rotor emf and rotor frequency – Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation – expressions for maximum torque and starting torque – torque slip characteristic – double cage and deep bar rotors

Speed control: change of frequency; change of poles and methods of consequent poles; cascade connection. injection of an emf into rotor circuit (qualitative treatment only)-induction generator-principle of operation

UNIT – V:**Single Phase Motors & Special Machines:** Single phase Motors: Single phase induction motor –

Constructional features-Double revolving field theory Equivalent circuit - split-phase motors -

Capacitor start Capacitor run motors. Principles of A.C. Series motor-Universal motor, Stepper motor shaded pole motor, **Reluctance Motors, Brushless DC motors** (Qualitative Treatment only).

TEXT BOOKS:

1. Electrical Machines, P.S. Bimbhra, Khanna Publishers.
2. Principles of Electrical Machines, V. K. Mehta, Rohit Mehta, S. Chand Publishing.
3. Electric Machines by I.J. Nagrath & D.P. Kothari, Tata Mc Graw – Hill Publishers.

REFERENCE BOOKS:

1. Electric Machines, Mulukutla S. Sarma, Mukesh K. Pathak, Cengage Learning.
2. Fundamentals of Electric Machines, B. R. Gupta, Vandana Singhal, New Age International Publishers.
3. Electric machinery – A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition.
4. Theory of Alternating Current Machinery- by Langsdorf, Tata McGraw-Hill Companies, 2nd edition

OUTCOMES:

At the end of the course the student will

1. Have a clear understanding of the materials used and features in the construction of the electrical machines like transformers, DC and AC motors and special purpose motors.
2. Acquire a basic knowledge on the principle of operation of all these machines
3. Have a basic knowledge on the Torque speed relations and the effect of load torque on their performance.
4. Will have fundamental concept on the speed control of the various types of motors.

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3	-/-/-	3

OPEN ELECTIVE - I
(R17A0551) DATABASE SYSTEMS

OBJECTIVES

1. To understand the basic concepts and the applications of database systems
2. To Master the basics of SQL and construct queries using SQL
3. To understand the relational database design principles
4. To become familiar with the basic issues of transaction processing and concurrency control
5. To become familiar with database storage structures and access techniques

UNIT I: INTRODUCTION

Data- Database: File Processing System Vs DBMS, History, Characteristic-Three schema Architecture of a database, Functional components of a DBMS.DBMS Languages-Database users and DBA.

UNIT II: DATABASE DESIGN

ER Model: Objects, Attributes and its Type. Entity set and Relationship set-Design Issues of ER model-Constraints. Keys-primary key, Super key, candidate keys. Introduction to relational model-Tabular, Representation of Various ER Schemas. ER Diagram Notations- Goals of ER Diagram- Weak Entity Set- Views.

UNIT III: STRUCTURED QUERY LANGUAGE

SQL: Overview, The Form of Basic SQL Query -UNION, INTERSECT, and EXCEPT– join operations: equi join and non equi join-Nested queries - correlated and uncorrelated- Aggregate Functions-Null values.

UNIT IV - DEPENDENCIES AND NORMAL FORMS

Importance of a good schema design,- Problems encountered with bad schema designs, Motivation for normal forms- functional dependencies, -Armstrong's axioms for FD's- Closure of a set of FD's,- Minimal covers-Definitions of 1NF,2NF, 3NF and BCNF- Decompositions and desirable properties -

UNIT V: TRANSACTIONS:

Transaction concept, transaction state, System log, Commit point, Desirable Properties of a Transaction, concurrent executions, serializability, recoverability, implementation of isolation, transaction definition in SQL, Testing for serializability, Serializability by Locks-Locking Systems with Several Lock Modes-Concurrency Control by Timestamps, validation.

TEXT BOOK:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan," Database System Concepts", McGraw-Hill, 6th Edition , 2010.
2. Fundamental of Database Systems, by Elmasri, Navathe, Somayajulu, and Gupta, Pearson Education.

REFERENCES:

1. Raghu Ramakrishnan, Johannes Gehrke, "Database Management System", McGraw Hill., 3rd Edition 2007.
2. Elmasri&Navathe,"Fundamentals of Database System," Addison-Wesley Publishing, 5th Edition, 2008.
3. Date.C.J, "An Introduction to Database", Addison-Wesley Pub Co, 8th Edition, 2006.
4. Peter rob, Carlos Coronel, "Database Systems – Design, Implementation, and Management", 9th Edition, Thomson Learning, 2009.

OUTCOMES

1. Demonstrate the basic elements of a relational database management system
2. Ability to identify the data models for relevant problems
3. Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data

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3	-/-/-	3

OPEN ELECTIVE - I**(R17A0351) ELEMENTS OF MECHANICAL ENGINEERING****OBJECTIVES:**

1. To give an insight to students about the behaviour of materials under external forces.
2. The concept of stress, strain, elasticity etc. as applied to various structures under loading are included.
3. The student able to learn about concept of fluids, turbines and engines.

UNIT - I

Stresses and strains: kinds of – stress-strains, elasticity and plasticity, Hooks law, stress –strain diagrams, modules of elasticity, Poisson's ratio, linear and volumetric strain, relation between E, N, and K, bars of uniform strength, compound bars and temperature stresses.

Shear force and bending moment: Types of supports – loads – Shear force and bending moment for cantilever and simply supported beams without overhanging for all types of loads.

UNIT - II

Theory of simple bending: simple bending formula, Distribution of Flexural and Shear stress in Beam section – Shear stress formula – Shear stress distribution for some standard sections.

Thin cylindrical shells: stress in cylindrical shells due to internal pressures, circumferential stress, longitudinal stress, design of thin cylindrical shells, spherical shells, change in dimension of the shell due to internal pressure, change in volume of the shell due to internal pressure

Thick Cylinders: Lamé's equation- cylinders subjected to inside and outside pressures Columns and Struts.

UNIT - III

Properties of Fluid : Stream line , streak line , path line , continuity equation pipes are in series, pipes are in parallel, HGL, TGL , Bernoullis equation .

Hydraulic pumps and turbines: working principles and velocity diagrams.

UNIT - IV

Internal combustion engines: classification of IC engines, basic engine components and nomenclature, working principle of engines, Four strokes and two stroke petrol and diesel engines, comparison of CI and SI engines, comparison of four stroke and two stroke engines, simple problems such as indicated power, brake power, friction power, specific fuel consumption, brake thermal efficiency, indicated thermal efficiency and mechanical efficiency.

UNIT - V

Belts - Ropes and chain: belt and rope drives, velocity ratio, slip, length of belt , open belt and cross belt drives, ratio of friction tensions, centrifugal tension in a belt, power transmitted by belts and ropes, initial tensions in the belt, simple problems.

Gear trains: classification of gears, gear trains velocity ratio, simple, compound –reverted and epicyclic gear trains.

TEXT BOOKS:

1. "Strength of Materials and Mechanics of Structures", B.C.Punmia, Standard Publications and distributions, 9 th ed.
2. Thermal Engineering, Ballaney,P.L., Khanna Publishers, 2003 .
3. Theory of Machines , S.S. Rattan , Tata McGraw Hill.
4. Fluid Mechanics and Hydraulic Machinery R.K. Bansal .

REFERENCE BOOKS:

1. Thermal Engineering, R.K. Rajput , Laxmi Publications .
2. Theory of Machines, R.S. Khurmi, S. Chand Publications.
3. Fluid Mechanics and Hydraulic Machinery, Modi & Seth.

OUTCOMES:

- 1.The student would be exposed to basic mechanical engineering machinery.
- 2.The student learned about mechanical components.
- 3.Student understand about engines and turbines .

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OPEN ELECTIVE - I
(R17A0352) GREEN ENERGY SYSTEMS

OBJECTIVES:

1. The course aims to highlight the significance of alternative sources of energy.
2. Green energy systems and processes and provides the theory and working principles of probable sources of renewable and green energy systems that are environmental friendly.

UNIT-I**Introduction:**

Solar Radiation: Role and potential of new and renewable sources, the solar energy option, Environmental impact of solar power, structure of the sun, the solar constant, sun-earth relationships, coordinate systems and coordinates of the sun, extraterrestrial and terrestrial solar radiation, solar radiation on tilted surface, instruments for measuring solar radiation and sun shine, solar radiation data, numerical problems. Photo voltaic energy conversion – types of PV cells, I-V characteristics.

Solar Energy Collection: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

UNIT – II

Solar Energy Storage And Applications: Different methods, sensible, latent heat and stratified storage, solar ponds, solar applications- solar heating/cooling technique, solar distillation and drying, solar cookers, central power tower concept and solar chimney.

Wind Energy: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, betz criteria, types of winds, wind data measurement.

UNIT – III

Bio-Mass: Principles of bio-conversion, anaerobic/aerobic digestion, types of bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, bio fuels, I.C. engine operation and economic aspects.

Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India.

Ocean Energy: OTEC, Principles of utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT – IV

Energy Efficient Systems: (A) Electrical Systems: Energy efficient motors, energy efficient lighting and control, selection of luminaire, variable voltage variable frequency drives (adjustable speed drives), controls for HVAC (heating, ventilation and air conditioning), demand site management.

(B) Mechanical Systems: Fuel cells- principle, thermodynamic aspects, selection of fuels & working of various types of fuel cells, Environmental friendly and Energy efficient compressors and pumps.

UNIT-V

Energy Efficient Processes: Environmental impact of the current manufacturing practices and systems, benefits of green manufacturing systems, selection of recyclable and environment friendly materials in manufacturing, design and implementation of efficient and sustainable green production systems with examples like environmental friendly machining, vegetable based cutting fluids, alternate casting and joining techniques, zero waste manufacturing.

Green Buildings: Definition, features and benefits. Sustainable site selection and planning of buildings for maximum comfort. Environmental friendly building materials like bamboo, timber, rammed earth, hollow blocks, lime & lime pozzolana cement, agro materials and industrial waste, Ferro cement and Ferro-concrete, alternate roofing systems, paints to reduce heat gain of the buildings. Energy management.

TEXT BOOKS:

1. Sukhatme S.P. and J.K.Nayak, Solar Energy – Principles of Thermal Collection and Storage, TMH.
2. Khan B.H., Non-Conventional Energy Resources, Tata McGraw Hill, New Delhi, 2006.
3. Green Manufacturing Processes and Systems, Edited by J. Paulo Davim, Springer 2013.

REFERENCES:

1. Alternative Building Materials and Technologies / K.S Jagadeesh, B.V Venkata Rama Reddy and K.S Nanjunda Ra.
2. Principles of Solar Energy / Frank Krieth & John F Kreider.
3. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.
4. Renewable Energy Technologies /Ramesh & Kumar /Narosa
5. Renewable Energy Technologies/ G.D Roy

OUTCOMES:

1. The student shall understand the principles and working of solar, wind, biomass, geo-thermal, ocean energies.
2. Green energy systems and appreciate their significance in view of their importance in the current scenario and their potential future applications.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech IT-II Sem

L	T/P/D	C
3	-/-/-	3

OPEN ELECTIVE - I

(R17A0051) INTELLECTUAL PROPERTY RIGHTS

OBJECTIVES:

1. 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.

REFERENCES:

- 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.
- 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

1. It allows students how to prepare and protect the Inventions , start up ideas and rights of patents and copy rights etc.,
2. This subject brings awareness to the students the basic legal aspects at present following at Global level.

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III Year B.Tech. IT - I Sem

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4	-/-/-	4

(R17A0525)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. **Awk**- Execution, Fields and Records, Scripts, Operation, Patterns, Actions.

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, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples.

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, 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.

Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, 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.

UNIT V

Shared Memory- Kernel support for shared memory, APIs for shared memory, shared memory example. Comparison of IPC mechanisms.

Sockets- Introduction to Berkeley Sockets, Client-Server model, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

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 on assignments related to Systems Programming.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. IT - I Sem

L	T/P/D	C
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(R17A0513)OPERATING SYSTEMS**Objectives:**

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

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. Dhamdhare, TMH.
3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
4. Operating Systems, A. S. Godbole, 2nd Edition, TMH
5. Operating Systems, S, Haldar and A. A. Arvind, Pearson Education.
6. Operating Systems, R. Elmasri, A. G. Carrick and D. Levine, Mc Graw Hill.

Outcome:

- 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 and maximization of relevant performance criteria.
- Ability to compare the features of different OS

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(R17A0519)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, Cascading Style Sheets (CSS) & its Types. Introduction to Java Script, Declaring variables, functions, Event handlers (onclick, onsubmit, etc..) and Form Validation.

UNIT II:

Introduction to XML: Document type definition, XML Schemas, Presenting XML , Introduction to XHTML, Using XML Processors: DOM and SAX.

PHP: Declaring Variables, Data types, Operators, Control structures, Functions.

UNIT III:

Web Servers and Servlets: 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:

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. Introduction to struts frame works.

UNIT V:

JSP Application Development: The Anatomy of a JSP Page, JSP Processing. JSP Application Design and JSP Environment, JSP Declarations, Directives, Expressions, Scripting Elements, implicit objects.

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 (UNITs 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. Internet and World Wide Web – How to program by Dietel and Nieto PHI/ Pearson Education Asia.
3. Jakarta Struts Cookbook, Bill Siggelkow, S P D O' Reilly for chap 8.
4. March's beginning JAVA JDK 5, Murach, SPD
5. An Introduction to WEB Design and Programming – Wang-Thomson
6. PHP: The Complete Reference Steven Holzner Tata McGraw-Hill.

Course Outcomes:

1. Analyze a web page and identify its elements and attributes.
2. Create web pages using XHTML and Cascading Styles sheets.
3. Installation and usage of Server software's.
4. Database Connectivity to web applications
5. Build web applications using Servlet and JSP

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III Year B.Tech. IT - I Sem

L	T/P/D	C
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(R17A0514)COMPUTER NETWORKS**Objectives:**

- To introduce the fundamentals of computer networks.
- To demonstrate the framework of TCP/IP & OSI model.
- To know the role of various protocols in Networking.
- To learn the detailed functioning of various network layers.

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, IP addresses, CIDR, Subnetting, SuperNetting, IPv4, Packet Fragmentation, IPv6 Protocol, Transition from IPv4 to IPv6, ARP, RARP.

UNIT - IV:

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

The Internet Transport Protocols: UDP, 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 Algorithm.

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

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:

- Exploration of the various Computer Networks, Protocols and routing algorithms.
- Students will be in a position to understand the World Wide Web concepts and the need for network security.
- Ability to administrate a network and flow of information.

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III Year B.Tech. IT I-Sem

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(R17A0515)ADVANCED COMPUTER ARCHITECTURE**(Core Elective-I)****OBJECTIVES:**

- To learn the fundamental aspects of computer architecture, design and analysis.
- To understand processor design and associated concepts.
- To learn memory hierarchy and storage systems.
- To know the functional aspect of Instruction cycle.

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:

- Ability to assess the computer performance based on factors.
- Skills to compare the types of memory in hierarchy.
- Analysis of performance of various storage systems.

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III Year B.Tech-IT I – Sem

L	T/P/D	C
3	-/-/-	3

(R17A1201)AUTOMATA & COMPILER DESIGN**OBJECTIVES: -**

- To provide an understanding of automata, grammars, language translators.
- To know the various techniques used in compiler construction
- To be aware of the process of semantic analysis.
- To analyze the code optimization & code generation techniques.

UNIT - I:

Formal Language and Regular Expressions : Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis, lex tools.

Context Free grammars and parsing : Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL(1) parsing

UNIT - II:

Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

Semantics : Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

UNIT - III:

Context Sensitive features – Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

UNIT - IV:

Run time storage : Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

Code optimization : Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

UNIT - V:

Code generation : Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.

TEXT BOOKS:

1. Introduction to Theory of computation.Sipser, 2nd Edition, Thomson.
2. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

REFERENCES:

1. Modern Compiler Construction in C , Andrew W.Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Thomson.
3. Elements of Compiler Design, A. Meduna, Auerbach Publications, Taylor and Francis Group.
4. Principles of Compiler Design, V. Raghavan, TMH.

5. Engineering a Compiler, K. D. Cooper, L. Torczon, ELSEVIER.
6. Introduction to Formal Languages and Automata Theory and Computation - Kamala Krithivasan and Rama R, Pearson.
7. Modern Compiler Design, D. Grune and others, Wiley-India.
8. A Text book on Automata Theory, S. F. B. Nasir, P. K. Srimani, Cambridge Univ. Press.
9. Automata and Language, A. Meduna, Springer.

OUTCOMES:

- Understand the necessity and types of different language translators in use.
- Apply the techniques and design different components (phases) of a compiler.
- Ability to implement practical aspects of automata theory.
- Use the tools Lex, Yacc in compiler construction.

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III Year B.Tech. IT - I Sem

L	T/P/D	C
3	-/-/-	3

(R17A1202)NETWORK PROGRAMMING**(Core Elective-I)****Objectives:**

- To understand to Linux utilities
- To understand file handling, signals
- To understand IPC, network programming in Java
- To understand processes to communicate with each other across a Computer Network.

UNIT – I

Introduction to Network Programming: OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

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, functions, using system commands in awk.

UNIT - II

Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output 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.

Files: File Concept, Files System Structure, Inodes, File Attributes, File Types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors

Low level file access: File structure related system calls (File APIs), file and record locking

File and Directory Management: Directory file APIs, Symbolic links & hard links.

UNIT - III

Process: Process concept, Kernel support for process, process attributes, process control-process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.

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 IPC : Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, **Kernel support for** Message queues, Semaphores and Shared Memory. Unix system V APIs for messages, Semaphores and Shared Memory.

Multithreaded Programming: Differences between threads and processes, Thread structure and uses, Threads and Lightweight Processes, POSIX Thread APIs, Creating Threads, Thread Attributes, thread synchronization with semaphores and with Mutexes, Example program.

UNIT-V

Sockets: Introduction to sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example client/server programs.

Network Programming in Java-Network basics, TCP sockets, UDP sockets (datagram sockets), Server programs that can handle one connection at a time and multiple connections (using multithreaded server), Remote Method Invocation (Java RMI)-Basic RMI Process, Implementation details-Client-Server Application.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI. (Units I,II, III, IV & V)
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.(Unit I)
4. Unix Network Programming, W.R. Stevens, PHI.(Units II,III,IV & V)

REFERENCE BOOKS:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. UNIX for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.
4. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition.
5. UNIX Network Programming The Sockets Networking API, Vol.-I, W.R.Stevens, Bill Fenner, A.M.Rudoff, Pearson Education.
6. UNIX Internals, U.Vahalia, Pearson Education.
7. UNIX shell Programming, S.G.Kochan and P.Wood, 3rd edition, Pearson Education.
8. C Programming Language, Kernighan and Ritchie, PHI

Course Outcomes:

- Learn the utilities.
- Able to develop shell programs.
- Learn different API's (file, process etc.).
- Be familiar with techniques for inter process communication.
- Be familiar with socket programming

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L	T/P/D	C
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(R17A0591) 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:**

Practice File handling utilities, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.

Week 2:

a) 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.

b) 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:

a) Write a shell script to list all of the directory files in a directory

b) Write a shell script that deletes all lines containing the specified word in one or more files supplied as arguments to it.

c) 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) Scanning Directories (Ex: opendir(), readdir(),etc.)

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:

a) Write a C program to implement kill(), raise() and sleep() functions.

b) Write a C program to implement alarm(), pause() and abort() functions.

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 process using unnamed pipes
- b) Write a C program that illustrates communication between two process using named pipes or FIFO.

Week 10:

- a) Write a C program for File Locking.
- b) Write a C program that receives a message from message queue and display them.

Week 11:

Write a C program that illustrates two processes communicating using Shared memory.

Week 12:

Write client server programs using c for interaction between server and client process using sockets

Outcomes:

- Ability to understand the Linux environment
- Ability to perform the file management and multiple tasks using shell scripts in Linux environment.

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III Year B.Tech IT – I Sem

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(R17A0588) WEB TECHNOLOGIES LAB**Objectives:**

- To enable the student to program web applications using the following technologies HTML, Javascript ,XML, PHP ,Tomcat Server, Servlets ,JSP, Beans and Struts.

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

Develop and demonstrate the usage of inline, internal and external style sheet using CSS.

Week 3**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 4**Develop and demonstrate JavaScript with POP-UP boxes and functions for the following problems:****a)** Input: Click on Display Date button using onclick() functionOutput: Display **date** in the textbox**b)** Input: A number n obtained using **prompt**Output: **Factorial** of n number using **alert****Week 5****a)** Input: A number n obtained using **prompt**Output: A **multiplication table** of numbers from 1 to 10 of n using **alert****b)** Input: A number n obtained using **prompt** and add another number using **confirm**Output: **Sum** of the entire n numbers using **alert****Week 6**

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 7**Write an XML file which will display the Book information which includes the following:**

- 1) Title of the book
- 2) Author Name
- 3) ISBN number

- 4) Publisher name
- 5) Edition
- 6) Price

Write a **Document Type Definition (DTD)** to validate the above XML file. Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically

Week 8

Develop and demonstrate PHP Script for the following problems:

- a) Write a PHP Program to display current Date, Time and Day.
- b) Write a PHP Script to check whether the given number is Palindrome or not
- c) 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.

Week 9

Implement the following web applications using Servlets

- (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

Execute simple queries with Database using (a) PHP, (b) Servlets

Week 11

Implement the following web applications using JSP

- (i) Write a PHP Program to display current Date, Time and Day.
- (ii) 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.
- (iii) Write a program for deploying **Java Beans** in a JSP page.

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 WAMP 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)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**III Year B.Tech. IT - I Sem****L T/P/D C****2 -/-/ -****(R17A0007) 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:

- a. The student will become proficient in LSRW skills.
- b. They develop formal LSRW skills approach to different situations.
- c. They hone professional ethics and learn to be proficient formally.

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3	-/-/-	3

OPEN ELECTIVE II
(R17A0452) INDUSTRIAL ELECTRONICS

COURSE OBJECTIVES:

1. To get an overview of semi-conductor devices (such as PN junction diode & Transistor) and their switching characteristics.
2. To understand the characteristics of AC to DC converters.
3. To understand about the practical applications Electronics in industries.

UNIT I

Scope of industrial Electronics, Semiconductors, Merits of semiconductors, crystalline structure, Intrinsic semiconductors, Extrinsic semiconductors, current flow in semiconductor, Open-circuited p-n junction, Diode resistance, Zener diode, Photoconductors and junction photo diodes, Photo voltaic effect, Light emitting diodes (LED)

UNIT II

Introduction, The junction transistor, Conventions for polarities of voltages and currents, Open circuited transistor, Transistor biased in the active region, Current components in transistors, Currents in a transistor, Emitter efficiency, Transport factor and transistor- α , Dynamic emitter resistance, Transistor as an amplifier, Transistor construction, Letter symbols for semiconductor Devices, Characteristic curves of junction transistor in common configuration, static characteristic curves of PNP junction transistor in common emitter configuration, The transistor in common collector Configuration.

UNIT III

AC to DC converters- Introduction, Classification of Rectifiers, Half wave Rectifiers, Full wave Rectifiers, Comparison of Half wave and full wave rectifiers, Bridge Rectifiers, Bridge Rectifier meter, Voltage multiplying Rectifier circuits, Capacitor filter, LC Filter, Metal Rectifiers, Regulated Power Supplies, Classification of Voltage Regulators, Short period Accuracy of Regulators, Long period .Accuracy of Voltage Regulator, Principle of automatic voltage Regulator, Simple D.C. Voltage stabilizer using Zener diode, D.C. Voltage Regulators, Series Voltage Regulators, Complete series voltage regulator circuit, Simple series voltage regulator.

UNIT IV

Resistance welding controls: Introduction, Resistance welding process, Basic Circuit for A.C. resistance welding, Types of Resistance welding, Electronic welding control used in Resistance welding, Energy storage welding. **Induction heating:** Principle of induction heating, Theory of Induction heating merits of induction heating, Application of induction heating, High frequency power source of induction heating. **Dielectric heating:** Principle of dielectric heating, theory of dielectric heating, dielectric properties of typical materials, electrodes used in dielectric heating, method of coupling of electrodes to the R.F. generator, Thermal losses in Dielectric heating, Applications.

UNIT V :

Ultrasonics: Introduction, Generation of Ultrasonic waves, Application of Ultrasonic waves, Ultrasonic stroboscope, ultrasonic as means of communication, ultrasonic flaw detection, Optical image on non-homogeneities, ultrasonic study of structure of matter, Dispersive

study of structure of matter, Dispersive and colloidal effect of Ultrasonic, Coagulating action of Ultrasonic, separation of mixtures by ultrasonic waves, cutting and machining of hard materials by ultrasonic vibrations, Degassing of liquids by ultrasonic waves, Physico-chemical effects of ultrasonics, chemical effects of ultrasonics, Thermal effects of Ultrasonics, soldering and welding by ultrasonics, Ultrasonic Drying

TEXT BOOKS:

1. G. K. Mithal, "Industrial Electronics", Khanna Publishers, Delhi, 2000.
2. J.Gnanavadeivel, R.Dhanasekaran, P.Maruthupandi, "Industrial Electronics", Anuradha Publications, 2011.

REFERENCE BOOKS:

1. F. D. Petruzella, "Industrial Electronics", McGraw Hill, Singapore, 1996.
2. M. H. Rashid, "power Electronics Circuits, Devices and Application", PHI, 3rd edition, 2004.
3. G. M. Chute and R. D. Chute, "Electronics in Industry", McGraw Hill Ltd, Tokyo, 1995.

COURSE OUTCOMES

After completion of the course the students will be able to

1. Get an overview of semi-conductor devices (such as PN junction diode & Transistor) and their switching characteristics.
2. Understand the characteristics of AC to DC converters.
3. Understand about the practical applications Electronics in industries.

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3	-/-/-	3

OPEN ELECTIVE II
(R17A0453) COMMUNICATION NETWORKS

COURSE OBJECTIVES

1. To understand the concept of computer communication.
2. To learn about the networking concept, layered protocols.
3. To understand various communications concepts.
4. To get the knowledge of various networking equipment.

UNIT – I: Overview of Computer Communications and Networking: Introduction to Computer Communications and Networking, Introduction to Computer Network, Types of Computer Networks, Network Addressing, Routing, Reliability, Interoperability and Security, Network Standards, The Telephone System and Data Communications.

UNIT – II: Essential Terms and Concepts: Computer Applications and application protocols, Computer Communications and Networking models, Communication Service Methods and data transmission modes, analog and Digital Communications, Speed and capacity of a Communication Channel, Multiplexing and switching, Network architecture and the OSI reference model.

UNIT – III: Analog and Digital Communication Concepts: Representing data as analog signals, representing data as digital signals, data rate and bandwidth reduction, Digital Carrier Systems.

UNIT – IV: Physical and Data Link Layer Concepts: The Physical and Electrical Characteristics of wire, copper media, fiber optic media, Wireless communications. Introduction to data link layer, logical link control and medium access control sub-layers.

UNIT – V: Network Hardware Components: Introduction to Connectors, Transreceivers and media convertors, repeaters, network interference cards and PC cards, bridges, switches, Switches vs Routers.

TEXT BOOKS:

1. Computer Communications and Networking Technologies, Michel A.Gallo and William H.Hancock, Thomson Brooks/Cole.
2. Data Communications and Networking – Behrouz A Forouzan, Fourth Edition, McGraw Hill Education, 2006.

REFERENCE BOOKS:

1. Principles of Computer Networks and Communications, M Barry Dumas, Morris Schwartz, Pearson.
2. Computer Networking: A Top-Down Approach Featuring the Internet, James F.Kurose, K W Ross, 3rd Edition, Pearson Education.

COURSE OUTCOMES

1. The student can get the knowledge of networking of computers, data transmission between computers.
2. Will have the exposure about the various communication concepts.
3. Will get awareness about the structure and equipment of computer network structures.

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OPEN ELECTIVE II**(R17A0552) INTRODUCTION TO JAVA PROGRAMMING****COURSE OBJECTIVES:**

This subject aims to introduce students to the Java programming language. Upon successful completion of this subject, students should be able

- 1) to create Java programs that leverage the object-oriented features of the Java language, such as encapsulation, inheritance and polymorphism;
- 2) use data types, arrays and strings;
- 3) implement error-handling techniques using exception handling,
- 4) create and event-driven GUI using AWT components.

UNIT I: OOP Concepts: Data abstraction, encapsulation, inheritance, Polymorphism, classes and objects, Procedural and object oriented programming paradigms.

Java Basics History of Java, Java buzzwords, data types, variables, constants, scope and life time of variables, operators, expressions, control statements, type conversion and casting, simple java programs, concepts of classes, objects, arrays, strings, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, Buffered Reader class, Scanner class, String Tokenizer class, inner class.

UNIT II: Inheritance – Types of Inheritance, super keyword, and preventing inheritance: final classes and methods.

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

Interfaces- Interfaces Vs Abstract classes, defining an interface, implement interfaces, extending interface.

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

UNIT III: Exception handling - Concepts of exception handling, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, checked exceptions and unchecked exceptions, built in exceptions.

Multi threading: Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, inter thread communication.

UNIT IV: Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Event Handling: Events, Handling mouse and keyboard events, Adapter classes.

Files- Streams- Byte streams, Character streams, Text input/output.

UNIT V: GUI Programming with Java – AWT class hierarchy, component, container, panel, window, frame, graphics.

AWT controls: Labels, button, text field, check box, and graphics.

Layout Manager – Layout manager types: border, grid and flow.

Swing – Introduction, limitations of AWT, Swing vs AWT.

TEXT BOOKS:

1. Java- the complete reference, 7th edition, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson education.
3. Core Java an integrated approach, dreamtech publication, Dr. R.Nageswara Rao.

REFERENCE BOOKS:

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

COURSE OUTCOMES:

- 1) An understanding of the principles and practice of object oriented programming and design in the construction of robust, maintainable programs which satisfy their requirements;
- 2) A competence to design, write, compile, test and execute straightforward programs using a high level language;
- 3) An appreciation of the principles of object oriented programming;
- 4) An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- 5) Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- 6) Be able to make use of members of classes found in the Java API.
- 7) 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.
- 8) Able to develop applications using Applet, awt and GUI Programming.

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OPEN ELECTIVE II**(R17A01251) INTRODUCTION TO SCRIPTING LANGUAGES****COURSE OBJECTIVES:**

- 1) Learning the basics of scripting languages like PERL, JAVASCRIPT, PYTHON
- 2) Understanding the requirements and uses of Scripting.
- 3) In-depth knowledge of programming features of Perl and Python.
- 4) Knowing the implementation model for scripting and design of applications.

UNIT I

Introduction to PERL and Scripting Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Uses for 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.

UNIT II

HTML: HTML basics, Elements, Attributes and Tags, Basic Tags, Advanced Tags, Frames, Images.

Cascading style sheets: Adding CSS, CSS and page layout.

JavaScript: Introduction, Variables, Literals, Operators, Control structure, Conditional statements, Arrays, Functions, Objects, Predefined objects, Object hierarchy, Accessing objects.

UNIT III

JavaScript programming of reactive web pages elements: Events, Event handlers, multiple windows and Frames, Form object and Element, Advanced JavaScript and HTML, Data entry and Validation, Tables and Forms.

Introduction to Python Programming: History of Python, Need of Python Programming, Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation, Types - Integers, Strings, Booleans.

UNIT IV

Operators and Expressions: Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations.

Data Structures: Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences.

UNIT V

Control Flow - if, if-else, for, while, break, continue, pass

Functions - Defining Functions, Calling Functions, Passing Arguments, Default Arguments, Variable-length arguments, Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables. Development of sample scripts and web applications.

TEXT BOOKS:

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Learning Python, Mark Lutz, Orielly
3. Web Programming, building internet applications, Chris Bates 2nd Edition, WILEY
4. Beginning JavaScript with Dom scripting and AJAX, Russ Ferguson, Christian Heilmann, Apress.
5. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.

REFERENCES:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python, M.Lutz, SPD.
3. Core Python Programming, Chun, Pearson Education.
4. Guide to Programming with Python, M.Dawson, Cengage Learning.
5. Perl by Example, E.Quigley, Pearson Education.
6. Programming Perl, Larry Wall, T.Christiansen and J.Orwant, O'Reilly, SPD.

COURSE OUTCOMES:

1. Analyze the differences between typical scripting languages and application programming languages.
2. Application of knowledge of scripting languages to design programs for simple applications.
3. Create software systems using scripting languages, including Perl and Python.

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OPEN ELECTIVE II**(R17A01252) SOFTWARE PROJECT MANAGEMENT****COURSE OBJECTIVES:**

The Main goal of software development projects is to create a software system with a predetermined functionality and quality in a given time frame and with given costs. For achieving this goal, models are required for determining target values and for continuously controlling these values. This course focuses on principles, techniques, methods & tools for model-based management of software projects, assurance of product quality and process adherence (quality assurance), as well as experience - based creation & improvement of models (process management).

The Objectives of the course can be characterized as follows:

- 1) Understanding the specific roles within a software organization as related to project and process management
- 2) Understanding the basic infrastructure competences (e.g., process modeling and measurement)
- 3) 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 Royce, "Software Project Management", 1998, PEA.
2. Henry, "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

COURSE OUTCOMES:

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

- 1) Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project
- 2) Compare and differentiate organization structures and project structures.
- 3) Implement a project to manage project schedule, expenses and resource with the application of suitable project management tools

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OPEN ELECTIVE II**(R17A0353) ENTERPRISE RESOURCE PLANNING****COURSE OBJECTIVES**

- 1) To know the basics of ERP
- 2) To understand the key implementation of ERP
- 3) To know the business modules of ERP
- 4) To evaluate the current and future trends in ERP

UNIT 1

INTRODUCTION: Overview and Benefits of ERP, ERP Related Technologies- Business Process Reengineering (BPR), Online Analytical Processing (OLAP), Supply chain Management (SCM). Applications of ERP.

UNIT II

ERP IMPLEMENTATION: Implementation and Product Lifecycle, Implementation Methodology, Planning Evaluation and selection of ERP systems, Organizing the Project Management and Monitoring. Case Study on Manufacturing.

UNIT III

ERP MODULES: Business modules in an ERP Package- Manufacturing, Human Resources, Plant Maintenance, Materials Management, Data Warehousing, Data Mining, Quality Management, Sales and Distribution. Case Study in Banking Sector.

UNIT IV

POST IMPLEMENTATION: Overview of ERP software solution. Maintenance of ERP- Organizational and Industrial impact; Success and Failure factors of ERP Implementation. Case Study of Success Story and Failure of Processing Sector.

UNIT V

EMERGING TRENDS IN ERP: Extended ERP system, ERP add-ons –Customer Relations Management (CRM), Customer satisfaction (CS). Business analytics etc- Future trends in ERP systems-web enabled, Wireless technologies. Case Study in Service Sector.

TEXT BOOKS:

1. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill, 2008
2. Alexis Leon, "ERP Demystified", Tata McGraw Hill, New Delhi, 2000
3. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India, 2009.

REFERENCE BOOKS:

1. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill, 2008.
2. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India, 2nd edition, 2006.
3. Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning", Thompson Course Technology, USA, 2001.

Course Outcomes:

- 1) To know the strategic importance of Enterprise Resource Planning
- 2) To Understand and implement ERP in various Sectors.

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3 -/-/ 3

(R17A0522) DISTRIBUTED SYSTEMS**Objectives:**

- To learn the principles and programming models used in distributed systems.
- To know the concept of IPC.
- To understand the framework of DFS and DSM.
- To be aware of the concept of Distributed transaction.

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 Study 2: 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.

Course Outcomes:

1. Identification and analysis of the core concepts of distributed systems.
2. To design and implement sample distributed systems.
3. To examine state-of-the-art distributed systems.

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III Year B.Tech IT – II Sem

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4 -/-/ - 4

(R17A0518)OBJECT ORIENTED ANALYSIS AND DESIGN**Objectives:**

- To understand the object oriented life cycle.
- To learn how to identify objects, relationships, services and attributes through UML.
- To understand the purpose of various UML diagrams.
- To be aware of the Object Oriented Design process.

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:

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.
- 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.

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4 -/-/ 4

(R17A0524) DATA WAREHOUSING AND DATA MINING**Objectives:**

- Study data warehouse principles and its working.
- Learn data mining concepts and understand association rules mining.
- Study classification algorithms
- Gain knowledge of 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 Education.

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:

- Comparison of functional differences between data warehouse and database systems.
- Ability to perform the pre-processing of data and apply mining techniques on it.
- Capability to identify the association rules, classification and clusters in large data sets.
- Skills to solve real world problems in business and scientific information using data mining

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(R17A0464) EMBEDDED SYSTEMS**COURSE OBJECTIVES:**

For embedded systems, the course will enable the students to:

- 1) To understand the basics of microprocessors and microcontrollers architecture and its functionalities
- 2) Understand the core of an embedded system
- 3) To learn the design process of embedded system applications.
- 4) To understand the RTOS and inter-process communication.

UNIT-I: INTRODUCTION TO MICROPROCESSORS AND MICROCONTROLLERS: 8086 Microprocessor:

Architecture of 8086, Register Organization, Programming Model, Memory Segmentation, Signal descriptions of 8086, Addressing modes, Instruction Set.

8051 Microcontroller: 8051 Architecture, I/O Ports, Memory Organization, Instruction set of 8051.

UNIT-II: INTRODUCTION TO EMBEDDED SYSTEMS:

History of embedded systems, Classification of embedded systems based on generation and complexity, Purpose of embedded systems, Applications of embedded systems, and characteristics of embedded systems, Operational and Non-operational attributes of embedded systems.

UNIT-III: TYPICAL EMBEDDED SYSTEM

Core of the embedded system, Sensors and actuators, Onboard communication interfaces-I2C, SPI, parallel interface; External communication interfaces-RS232, USB, infrared, Bluetooth, Wi-Fi, ZigBee, GPRS.

UNIT-IV: 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.

UNIT-V EMBEDDED PROGRAMMING CONCEPTS

Data types, Structures, Modifiers, Loops and Pointers, Macros and Functions, object oriented Programming, Embedded Programming in C++ & JAVA

TEXT BOOKS:

1. Embedded Systems, Raj Kamal, Second Edition TMH.
2. Kenneth. J. Ayala, The 8051 Microcontroller , 3rd Ed., Cengage Learning
3. Introduction to Embedded Systems - shibu k v, Mc Graw Hill Education.

REFERENCE BOOKS:

1. Advanced Microprocessors and Peripherals – A. K. Ray and K.M. Bhurchandi, TMH, 2nd Edition 2006
2. Embedded Systems- An integrated approach - Lyla B Das, Pearson education 2012.

COURSE OUTCOMES:

After going through this course the student will be able to

- 1) The student will learn the internal organization of popular 8086/8051 microprocessors/microcontrollers.
- 2) Understand and design the Embedded systems
- 3) Understand Embedded Firmware design approaches
- 4) Learn the basics of RTOS

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(R17A0517) COMPUTER GRAPHICS**(Core Elective II)****Objectives:**

- To make students understand about fundamentals and applications of Graphics.
- To learn and understand 2 D and 3 D transformations and related algorithms.
- To enable them to design animated scenes for virtual object creations.
- To make the students 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, Feiner 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. rocedural 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 in entertainment.
- Development of simple graphics applications.
- Ability to work in computer aided design for content presentation..
- Better analysis of data with pictorial representation.

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(R17A0520)SOFTWARE TESTING METHODOLOGIES**(Core Elective II)****Objectives:**

- To learn and understand the tools and techniques of software testing and its practice in the industry.
- To be aware of the differences between the various testing strategies.
- To know the taxonomy and purpose of software testing tools.

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.

TEXT BOOKS:

1. Software Testing techniques - Boris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

REFERENCES:

1. The craft of software testing - Brian Marick, Pearson Education.
2. 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:

- Ability to test a process for continuous quality improvement
- Generation of test cases from requirements
- Analysis of Modeling techniques: UML: FSM and State charts, Combinatorial design etc.
- Test generation from models.
- Test adequacy assessment.

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**(R17A1203) INFORMATION SECURITY MANAGEMENT
(Core Elective II)****Objectives:**

- To understand the scope of security management.
- To learn the types of security attacks.
- To know the concept of data leakage and security policies.
- To be aware of the roles and responsibilities in IS.

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.

Unit II**Fundamentals of Information Security:**

Key Elements of Networks, Logical Elements of Network, Critical Information Characteristics, Information States etc.

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.org/iso/home/standards/management-standards/iso27001.htm>
2. <http://csrc.nist.gov/publications/nistpubs/800-55-Rev1/SP800-55-rev1.pdf>

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(R17A0590)DATA WAREHOUSING AND DATA MINING 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.Data Warehouse schemas – star, snowflake, fact constellation

3.Data cube construction – OLAP operations

4.Data Extraction, Transformations & Loading operations

5.Implementation of Attribute oriented induction algorithm

6.Implementation of apriori algorithm

7.Implementation of FP – Growth algorithm

8. Implementation of Decision Tree Induction

9.Calculating Information gain measures

10. Classification of data using Bayesian approach

11. Classification of data using K – nearest neighbour approach

12. Implementation of K – means algorithm

13. Implementation of PAM 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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(R17A0589) CASE TOOLS AND SOFTWARE TESTING METHODOLOGIES LAB**OBJECTIVES:**

- Demonstrate the UML diagrams with ATM system descriptions.
- Design various diagrams for a business system.
- Demonstrate the working of software testing tools with c language.
- Study of testing tools- win runner, selenium etc.
- Writing test cases for various applications.

CASE TOOLS LAB

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.

Software Testing Methodologies 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 plan document for any application (eg: Library management system)

Week 7: Study of any testing tool (Load runner)

Week 8: Study of any web testing tool (Selenium)

Week 9: Study of any bug tracking tool (Bugzilla)

Week 10: Study of any test management tool(Test link)

Week 11: a) write minimum 20 test cases for gmail application
b) test facebook manually

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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OPEN ELECTIVE III**(R17A0454) ROBOTICS & AUTOMATION****COURSE OBJECTIVES:**

- 1) To study overview of Embedded Systems, Robots, Microprocessors & Microcontrollers.
- 2) To study in detail about Robotics and sensors.
- 3) To study about AVR RISC Microcontroller architecture in detail.
- 4) To study about ARM Processor in detail.
- 5) To study about Artificial Intelligence in Robotics.

UNIT - I

Introduction to Embedded System Design, Categories of ES, Overview of Embedded System Architecture, Recent Trends in Embedded Systems, Hardware Architecture of Embedded System, Real-time Embedded Systems and Robots, Robots and Robotics, Microprocessors and Microcontrollers, Microcontroller or Embedded Controller

UNIT - II

Robotics: Classification of Robots, Degree of freedom, Kinematics; Multidisciplinary approach: Motors-DC motors, Stepper Motors, Servo Motors; Power Transmission-Type of Gears, Gear Assembly, CAM follower, Sensors, Open loop and Closed-loop Controls, Artificial Intelligence.

UNIT- III

The AVR RISC microcontroller architecture: Introduction , AVR family architecture, register file, the ALU, memory access and instruction execution, I/O memory ,EEPROM ,I/O ports, timers, UART, Interrupt structure.

UNIT-IV

ARM Processor: Fundamentals, Registers, current program status register, pipeline concept, Interrupt and the vector table.

UNIT V

AI IN ROBOTICS: Robotic perception, localization, mapping- configuring space, planning uncertain movements, dynamics and control of movement, Ethics and risks of artificial intelligence in robotics.

TEXT BOOKS:

[1] Subrata Ghoshal, "Embedded Systems & Robots", Cengage Learning

[2] Stuart Russell, Peter Norvig, "Artificial Intelligence: A modern approach", Pearson Education, India 2003.

[3] ARM System Developer's Guide: Designing and Optimizing System Software- Andrew N. Sloss, Dominic Symes, Chris Wright, Elsevier Inc., 2007

REFERENCE BOOKS:

[1] M.A. Mazidi, J.G. Mazidi, R.D. Mckinlay, "8051 Microcontroller and Embedded Systems", Pearson.

[2] Dr. K.V.K. Prasad, "Embedded/Real-Time Systems: Concepts Design & Programming", Dreamtech

[3] Microcontrollers and applications, Ajay V Deshmukh , TMGH, 2005

COURSE OUTCOMES:

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

- 1) Understand the overview of Embedded Systems, Robots, Microprocessors & Microcontrollers.
- 2) Understand in detail about Robotics and sensors.
- 3) Understand AVR RISC Microcontroller architecture in detail.
- 4) Understand about ARM Processor in detail.
- 5) Understand about Artificial Intelligence in Robotics.

COURSE OUTCOMES:

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

1. Describe the various elements that make an industrial robot system
2. Discuss various applications of industrial robot systems
3. Analyze robot manipulators in terms of their kinematics, kinetics, and control
4. Model robot manipulators and analyze their performance, through running simulations using
a MATLAB-based Robot Toolbox
5. Select an appropriate robotic system for a given application and discuss the limitations of such a system
6. Program and control an industrial robot system that performs a specific task.

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OPEN ELECTIVE III**(R17A1253)MANAGEMENT INFORMATION SYSTEMS****Course Objective:**

- To understand the competitive advantage of using information systems in the organization for the needful assistance in decision making and management.
- To learn how to plan for information systems & implementation
- To study about security aspects of information systems

Unit-I:

Introduction : MIS importance, definition, nature and scope of MIS, Structure and Classification of MIS, Information and Systems Concept, Types of Information, Information systems for competitive advantage.

Case Study: MIS at any business establishment.

Unit-II:

Business Applications of Information Systems : E-Commerce, ERP Systems, DSS, Business Intelligence and Knowledge Management System.

Case Study: Knowledge Management Systems at an Enterprise.

Unit-III:

Management of IS: Information system planning, system acquisition, systems implementation, evaluation & maintenance of IS, IS Security and Control.

Effectiveness of MIS: A Case Study.

Unit-IV:

Building of Information Systems: System Development Stages, System Development Approaches.

Systems Analysis and Design- Requirement Determination, Strategies for Requirement Determination.

Structured Analysis Tools, System Design – Design Objectives, Conceptual Design, Design Methods. Detailed system design.

Unit-V:

Introduction to Cyber Crime : Cyber Crime Definition and origin of the word, cyber crime and

information security, cyber criminals. Classification of cyber criminals-Legal Perspectives-Indian Perspectives-Cyber crimes and indian ITA 2000,Global perspective on cybercrime-Cybercrime era.(Refer : Nina Godbole et al)

TEXT BOOK

D P Goyal, Management Information Systems–Managerial Perspective, MacMillan, 3rd Edition, 2010.

REFERENCE:

1. Nina Godbole & Sunit Belapure “ Cyber Security” Wiley india 2012.
2. Jawadekar, MIS Text and Cases, TMH, 2012.
3. Dr Milind M Oka “Cases in Management Information system ‘Everest, 2012.
4. A K Gupta, Sharma “Management of Systems” Macmillan, 2012.
5. Sandra Senf “Information Technology Control and Audit” 3e, CRC Press, 2012.
6. Apache OFBiz for Ecommerce and ERP - <https://ofbiz.apache.org/>
7. Magneto for Ecommerce (B2B Commerce) - <https://magento.com/>
8. Adempiere – ERP : <http://www.adempiere.net/web/guest/welcome>
9. Analytica – DSS - <http://www.lumina.com>
10. OpenRules – Business Rules and Decision Management system - <http://openrules.com/>

Course Outcome:

- a) Ability to apply Concepts & applications of Management Information Systems.
- b) Ability to perform Information Systems Planning & Implementations.
- c) Ability to adapt Cyber crime and information security procedures.

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(R17A0519) WEB TECHNOLOGIES

OPEN ELECTIVE III

COURSE OBJECTIVES:

- 1) Giving the students the insights of the Internet programming and how to design and implement complete applications over the web.
- 2) It covers the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side
- 3) Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications,
- 4) 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, Cascading Style Sheets (CSS) & its Types. Introduction to Java Script, Declaring variables, functions, Event handlers (onclick, onsubmit, etc.,) and Form Validation.

UNIT II:

Introduction to XML: Document type definition, XML Schemas, Presenting XML , Introduction to XHTML, Using XML Processors: DOM and SAX.

PHP: Declaring Variables, Data types, Operators, Control structures, Functions.

UNIT III:

Web Servers and Servlets: 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:

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. Introduction to struts frame works.

UNIT V:

JSP Application Development: The Anatomy of a JSP Page, JSP Processing. JSP Application Design and JSP Environment, JSP Declarations, Directives, Expressions, Scripting Elements, implicit objects. **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 (UNITs 1, 2)
2. Core SERVLETS AND JAVASERVER 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. Internet and World Wide Web – How to program by Dietel and Nieto PHI/ Pearson Education Asia.
3. Jakarta Struts Cookbook, Bill Siggelkow, S P D O' Reilly for chap 8.
4. March's beginning JAVA JDK 5, Murach, SPD
5. An Introduction to WEB Design and Programming – Wang-Thomson
6. PHP: The Complete Reference Steven Holzner Tata McGraw-Hill.

COURSE OUTCOMES:

- 1) Understand the insights of the Internet programming and how to design and implement complete applications over the web.
- 2) Understands the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side
- 3) Understand Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications,
- 4) Understand Programming Common Gateway Interfaces, Programming the User Interface for the web applications.

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OPEN ELECTIVE III
(R17A0553) DATA STRUCTURES

COURSE OBJECTIVES:

- 1) Exploring basic data structures such as stacks and queues.
- 2) Introduces a variety of data structures such as hash tables, search trees, heaps, graphs.
- 3) Introduces sorting algorithms

UNIT - I

Introduction to Data Structures: Data types, data structures basics, abstract data types, the running time of a program, the running time and storage cost of algorithms, complexity, asymptotic complexity, big O notation, obtaining the complexity of an algorithm.

Searching- Linear Search, Binary Search.

Sorting-Insertion Sort, Selection Sort, bubble sort, Quick sort, Merge sort, Comparison of Sorting methods.

UNIT - II

Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Operations, array and linked representations of stacks, stack applications, Queues-operations, array and linked representations, queue applications

UNIT – III

Dictionaries: linear list representation, skip list representation, operations - insertion, deletion and searching. Hash table representation: hash functions, collision resolution- separate chaining, open addressing- linear probing, quadratic probing, double hashing, and rehashing, extendible hashing.

UNIT - IV

Graphs – Introduction, Definition, Terminology, Graph Representations-Adjacency matrix, Adjacency lists, Graph traversals- DFS and BFS. Trees – Terminology, Representation of Trees, Properties of Binary Trees, Binary Tree Representations-array and linked representations, Binary Tree traversals.

UNIT - V

Priority Queue ,Different Types , Heap-Definition, types, insertion and Deletion operation on heaps. Search Trees: Binary Search Trees, Definition, Implementation, Operations- Searching,

Insertion and Deletion. AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching.

TEXTBOOKS

1. Fundamentals of data structures in C, 2 nd edition, E.Horowitz, S.Sahni and Susan Anderson
Freed, Universities Press.
2. Data structures using c – A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/pearson education.

REFERENCES

1. Data structures: A Pseudo code Approach with C, 2 nd edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning.
2. Introduction to data structures in c, 1/e Ashok Kamthane.

COURSE OUTCOMES:

1. Ability to select the data structures that efficiently model the information in a problem.
2. Ability to assess efficiency trade-offs among different data structure implementations or Combinations.
3. Implement and know the application of algorithms for sorting.
4. Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, heaps, graphs, and AVL-trees.

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OPEN ELECTIVE III (R15A0354) NANO TECHNOLOGY

COURSE OBJECTIVES:

- 1) To learn about basis of Nano Materials.
- 2) In this course we focus on synthetic aspects for the design of nanostructured materials.
- 3) We describe different approaches including both the bottom-up (includes both chemical and physical methods) and the top-down methods (mainly physical methods) for the synthesis of nanostructured materials.
- 4) The course will then focus on different type of nanostructures with a special emphasis on carbon nanotubes (CNT), metal and metal oxide nanoparticles, core-shell nanostructures and self assembly of these nanostructures.
- 5) The dependence of various properties (dielectric, magnetic and optical) with size will be discussed.

UNIT-I

General Introduction: Basics of Quantum Mechanics, Harmonic oscillator, magnetic Phenomena, band structure in solids, Mossbauer and Spectroscopy, optical phenomena bonding in solids, Anisotropy.

Silicon Carbide: Application of Silicon carbide, nano materials preparation, Sintering of SiC, X-ray Diffraction data, electron microscopy sintering of nano-particles, nano particles of Alumina and Zirconia: Nano materials preparation, Characterization, Wear materials and nano-composites,

UNIT-II

Mechanical properties: Strength of nano crystalline SiC, Preparation for strength measurements, Mechanical properties, Magnetic properties.

Electrical properties: Switching glasses with nanoparticles, Electronic conduction with nanoparticles.

Optical properties: Optical properties, special properties and the coloured glasses.

Magnetic Properties: Soft magnetic Nanocrystalline alloy, Permanent magnetic Nanocrystalline materials, Giant Magnetic Resonance, Electrical Properties, Optical Properties, Thermal Properties, and Mechanical Properties.

UNIT-III Synthesis Routes: Top & Bottom up approaches: Physical Vapor Deposition, Micromulsion, Laser Ablation, Chemical Vapor Deposition, Molecular Beam Epitaxy, Solgel method, Spray Pyrolysis, Template Based synthesis, Lithography.

UNIT-IV Tools to Characterize Nanomaterials: X-Ray Diffraction (XRD), Small Angle X-ray scattering (SAXS), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscope (STM), Field Ion Microscope (FEM), Three-dimensional Atom Probe (3DAP), Nanoindentation

UNIT-V Applications of Nanomaterials: Nano-electronics, Micro- and Nano-electromechanical systems (MEMS/NEMS), Nanosensors, Nanocatalysts, Cosmetic and Consumer Goods, Structure and Engineering, Automotive Industry, Water Treatment and the environment, Nano-medical applications, Textiles, Paints, Energy, Defence and Space

Applications.

TEXT BOOKS:

- 1) Text Book of Nano Science and Nano Technology – B.S. Murthy, P. Shankar, Baldev Raj, B.B. Rath and James Munday, University Press-IIM.
- 2) Introduction to Nanotechnology – Charles P. Poole, Jr., and Frank J. Owens, Wiley India Edition, 2012.
- 3) Guozhong Cao, Nanostructures and Nano-materials: Synthesis, Properties and Applications, Imperial College Press 2004.

REFERENCES BOOKS:

- 1) Nano: The Essentials by T. Pradeep, McGraw- Hill Education.
- 2) Nanomaterials, Nanotechnologies and Design by Michael F. Ashby, Paulo J. Ferreira and Daniel L. Schodek.
- 3) Transport in Nano structures- David Ferry, Cambridge University press 2000
- 4) Nanofabrication towards biomedical application: Techniques, tools, Application and impact – Ed. Challa S., S. R. Kumar, J. H. Carola.
- 5) Carbon Nanotubes: Properties and Applications- Michael J. O'Connell.
- 6) Electron Transport in Mesoscopic systems – S. Dutta, Cambridge University press.
- 7) Nanomaterials Synthesis, Properties and Applications Edited by A S Edelstein and R C Cammarata, IOP Publishing Ltd 1996.

COURSE OUTCOMES:

- 1) Will familiarize about the science of Nano Technology.
- 2) Will demonstrate the preparation of Nano Technology.
- 3) Will develop knowledge in characteristic Nano Technology & Nano Materials.

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OPEN ELECTIVE III
(R17A0355) TOTAL QUALITY MANAGEMENT

COURSE OBJECTIVES:

- 1) To facilitate the understanding of Quality Management principles and process.
- 2) To understand Customer focus, Employee focus and their involvement and Supplier Management.

UNIT – I

Introduction, The concept of TQM, Quality and Business performance, attitude, and involvement of top management, communication, culture and management systems. Management of Process Quality: Definition of quality, Quality Control, a brief history, Product Inspection vs. Process Control, Statistical Quality Control, Control Charts and Acceptance Sampling.

UNIT -II

Customer Focus and Satisfaction: internal customer conflict, quality focus, Customer Satisfaction, role of Marketing and Sales, Buyer – Supplier relationships. Bench Marking: Evolution of Bench Marking, meaning of bench marking, benefits of bench marketing, the bench marking procedure, pitfalls of bench marketing.

UNIT- III

Organizing for TQM: The systems approach, organizing for quality implementation, making the transition from a traditional to a TQM organization, Quality Circles, seven Tools of TQM: Stratification, check sheet, Scatter diagram, Kepner & Tregoe Methodology.

UNIT- IV

The Cost of Quality: Definition of the Cost of Quality, Quality Costs, Measuring Quality Costs, use of Quality Cost information, Accounting Systems and Quality Management.

UNIT –V

ISO9000: Universal Standards of Quality: ISO around the world, The ISO9000 ANSI/ASQC Q-90. Series Standards, benefits of ISO9000 certification, the third party audit, Documentation ISO9000 and services, the cost of certification implementing the system.

TEXT BOOK:

- Total Quality Management / Joel E. Ross/Taylor and Francis Limited
- Total Quality Management/P. N. Mukherjee/PHI

REFERENCE BOOKS:

- Beyond TQM / Robert L.Flood
- Total quality management by Paneer Selvam
- Statistical Quality Control / E.L. Grant.
- Total Quality Management:A Practical Approach/H. Lal
- Quality Management/Kanishka Bedi/Oxford University Press/2011
- Total Engineering Quality Management/Sunil Sharma/Macmillan

COURSE OUTCOMES:

- 1) The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
- 2) To give the students an overview of TQM, various Quality aspects and importance of Top Management Commitment in any organization for maintaining product / services quality.

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(R17A1204) ARTIFICIAL INTELLIGENCE**Objectives:**

- To Learn the significance of intelligence systems.
- To understand the concepts of heuristic search techniques & logic programming.
- To know the various knowledge representation techniques.
- To understand the applications of artificial intelligence i.e Expert systems ,game playing , Machine learning and natural language processing .

UNIT-I

Introduction, History, Intelligent Systems, Foundations of AI, Sub areas of AI, Applications. Problem Solving – State-Space Search and Control Strategies: Introduction, General Problem Solving, Characteristics of Problem, Exhaustive Searches, Heuristic Search Techniques, Iterative-Deepening A*, Constraint Satisfaction. Game Playing, Bounded Look-ahead Strategy and use of Evaluation Functions, Alpha-Beta Pruning

UNIT-II

Logic Concepts and Logic Programming: Introduction, Propositional Calculus, Propositional Logic, Resolution Refutation in Propositional Logic, Predicate Logic, Logic Programming. Knowledge Representation: Introduction, Approaches to Knowledge Representation, Knowledge Representation using Semantic Network, Extended Semantic Networks for KR, Knowledge Representation using Frames.

UNIT-III

Expert System and Applications: Introduction, Phases in Building Expert Systems, Expert System Architecture, Expert Systems Vs Traditional Systems, Truth Maintenance Systems, Application of Expert Systems, List of Shells and Tools. Uncertainty Measure – Probability Theory: Introduction, Probability Theory, Bayesian Belief Networks, Certainty Factor Theory, Dempster-Shafer Theory.

UNIT-IV

Machine-Learning Paradigms: Introduction. Machine Learning Systems .Supervised and Unsupervised Learning. Inductive Learning. Learning Decision Trees (Text Book 2), Deductive Learning. Clustering, Support Vector Machines. Artificial Neural Networks: Introduction, Artificial Neural Networks, Single- Layer Feed-Forward Networks, Multi-Layer Feed-Forward Networks, Design Issues of Artificial Neural Networks.

UNIT-V

Natural Language Processing: Introduction, Sentence Analysis Phases, Grammars and Parsers, Types of Parsers, Semantic Analysis, Universal Networking Knowledge, Semantic web.

TEXT BOOKS:

1. Saroj Kaushik. Artificial Intelligence. Cengage Learning. 2011
2. Russell, Norvig: Artificial intelligence, A Modern Approach, Pearson Education, Second Edition. 2004

REFERENCE BOOK:

1. Rich, Knight, Nair: Artificial intelligence, Tata McGraw Hill, Third Edition 2009.
2. Introduction to Artificial Intelligence by Eugene Charniak, Pearson.
3. Introduction to Artificial Intelligence and expert systems Dan W.Patterson. PHI.
4. Artificial Intelligence by George Fluger Pearson fifth edition.

OUTCOMES:

1. Ability to analyze & select a search algorithm for a problem.
2. Formalize a given problem using a suitable AI representation.
3. Ability to apply AI techniques to solve problems of expert systems , game playing , machine learning & neural networks.

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(R17A1205) PROGRAMMING FOR APPLICATION DEVELOPMENT**Course Objectives:**

1. To get an overview of the various technologies, which can help in the implementation of the various live Project.
2. To Understand the Basic Concepts of C#
3. To Understand the Exception Handling Mechanisms
4. To Understand the Various Concepts of .net Assemblies

UNIT I:

MS.NET Framework Introduction: The .NET Framework - an Overview- Framework Components – Framework Versions-Types of Applications ,MS.NET Namespaces - MSIL / Metadata and PE files- Common Language Runtime (CLR) - Managed Code -MS.NET Memory Management / Garbage Collection -Common Type System (CTS) - Common Language Specification (CLS)- Types of JIT Compilers-Security Manager .

UNIT II:

Developing Console Application: Introduction to Project and Solution in Studio- Entry point method - Main. - Compiling and Building Projects -Using Command Line Arguments -Importance of Exit code of an application- Different valid forms of Main-Compiling a C# program using command line utility CSC.EXE-Data types - Global, Stack and Heap Memory- Common Type System-Reference Type and Value Type- Data types & Variables Declaration- Implicit and Explicit Casting-

UNIT III:

Object Oriented Programming: Object -Lifecycle of an Object-relationship between Class and Object-Define Application using Objects-Principles of Object Orientation-Encapsulation –Inheritance- Polymorphism- Encapsulation is binding of State and Behavior together- understand the difference between object and reference- Working with Methods, Properties -Copy the reference in another reference variable-

Exception Handling: Exception -Rules for Handling Exception - Exception classes and its important properties - Understanding & using try, catch keywords -Throwing exceptions-Importance of finally block- & using & Statement -Writing Custom Exception Classes

UNIT IV:

Delegates And Events: Understanding the .NET Delegate type, defining a Delegate Type in C#, The System. Multicast Delegate and System. Delegate Base Classes, PROGRAMMING WITH .NET ASSEMBLIES: Configuring .NET Assemblies, defining Custom Namespaces, The role of .NET Assemblies, Understanding the Format of a .NET assembly, Building and Consuming a Single-File Assembly, Building and Consuming a Multifile Assembly, Understanding Private Assembly, Understanding Shared Assembly, Consuming a Shared Assembly, Configuring Shared assemblies.

UNIT V:

ADO.NET PART - I: The Connected Layer: A High-Level Definition of ADO.NET, Understanding ADO.NET Data Provider, Additional ADO.NET Namespaces, The Types of the System.Data.namespace, Abstracting Data Providers Using Interfaces, Creating the Auto Lot Database. Library, Programming with LINQ to DataSet.

TEXT BOOKS:

1.Andrew Troelsen (2010), Pro C# and the .NET 4 Platform, 5th edition, Springer (India) Private Limited, New Delhi, India.

REFERENCE BOOKS:

1.E. Balagurusamy (2004), Programming in C#, 5th edition, Tata McGraw-Hill, New Delhi, India.

2.Herbert Schildt (2004), The Complete Reference: C#, Tata McGraw-Hill, New Delhi, India.

3.Simon Robinson, Christian Nagel, Karli Watson, Jay Gl (2006), Professional C#, 3rd edition, Wiley & Sons, India.

Course Outcome:

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

1. Implementation of OOps Concepts in ASP.net
2. Be able to Implement, Compile, Test & Run Applications Programs.
3. Demonstrate the ability to use Exception Handling Mechanisms.
4. Able to Develop Applications using Asp.net,C#.

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L T/P/D C**3 -/-/ 3****(R17A1206)MOBILE APPLICATION DEVELOPMENT****OBJECTIVES**

- Mobile Application Development course exposes the students to essentials of mobile apps development.
- The core modules of this subject include designing, developing, testing, signing, packaging and distributing high quality mobile apps.
- This course aims to teach mobile app development using Android as the development platform.

UNIT I:

Introduction to Mobile A brief history of Mobile, The Mobile Ecosystem, Why Mobile?, Types of Mobile Applications, Mobile Information Architecture, Mobile Design, Mobile 2.0, Mobile Web development, Small Computing Device Requirements.

J2ME: Overview The World of Java, Inside J2ME, J2ME Architecture, MIDlet Programming, J2ME Wireless Toolkit, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite

UNIT II:

Introduction to Android: History of Android, Introduction to Android, Operating Systems, Android Development Tools, Android Architecture.

UNIT III:

Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a android project –Hello Word, run on emulator, Deploy it on USB-connected Android device

UNIT IV:

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners(Combo boxes),Images, Menu, Dialog.

UNIT V:

Database: Understanding of SQLite database, connecting with the database.

TEXTBOOKS:

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill
2. Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.
3. Lauren Darcey and Shane Conder, —Android Wireless Application Development||, Pearson Education, 2nd ed. (2011)

REFERENCE BOOKS:

1. Reto Meier, —Professional Android 2 Application Development||, Wiley India Pvt Ltd
2. Mark L Murphy, —Beginning Android||, Wiley India Pvt Ltd
3. Sayed Y Hashimi and Satya Komatineni, —Pro Android||, Wiley India Pvt Ltd.
developer.android.com (web)
4. Android Application Development All in one for Dummies by Barry Burd, Edition: I
5. Teach Yourself Android Application Development In 24 Hours, Edition:I, Publication: SAMS

Outcomes:

- Upon completion of this course, student shall be able to:
- Appreciate the Mobility landscape
- Familiarize with Mobile apps development aspects
- Design and develop mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications.
- Perform testing, signing, packaging and distribution of mobile apps.
- The student can design and develop mobile application using J2ME

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(R17A0527) CLOUD COMPUTING**Objectives:**

1. To understand the various distributed system models and evolving computing paradigms
 - To gain knowledge in virtualization of computer resources
 - To realize the reasons for migrating into cloud
2. To introduce the various levels of services that can be achieved by a cloud.
3. To describe the security aspects in cloud and the services offered by a 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.Tanurai Selvi, TMH, 2012.

Reference Books:

1. Cloud Computing : A Practical Approach, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, Tata McGraw Hill, rp2011.
2. Enterprise Cloud Computing, Gautam Shroff, Cambridge University Press, 2010.
3. Cloud Computing: Implementation, Management and Security, John W.Rittinghouse, James F.Ransome, CRC Press, rp2012.
4. Cloud Application Architectures: Building Applications and Infrastructure in the Cloud, George Reese, O'reilly, SPD, rp2011.
5. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, rp2011.

Outcomes:

- To distinguish the different models and computing paradigms.
- To explain the levels of virtualization and resources virtualization
- To analyze the reasons for migrating into cloud
- To effectively use the cloud services in terms of infrastructure and operating platforms.
To apply the services in the cloud for real world scenarios

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(R17A1207)MULTIMEDIA & RICH INTERNET APPLICATIONS**(Core Elective III)****Objectives:**

- This course aims to further develop students' competency in producing dynamic and creative graphic solutions for multimedia productions. It provides students with the basic concepts and techniques of interactive authoring.
- It also introduces students with the advanced scripting skills necessary for
- implementing highly interactive, rich internet applications using multimedia technologies and authoring tools.
- Students will develop aesthetic value and competencies in multimedia authoring. Artistic visual style and layout design are stressed, as well as the editing and integration of graphic images, animation ,video
- and audio files. The course allows students to master industry -wide software and technologies to create highly interactive, rich internet applications

UNIT - I

Fundamental concepts in Text and Image: Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT- II

Multimedia Data Compression: Lossless compression algorithms, Lossy compression algorithms, Image compression standards.

Basic Video compression techniques, Case study: MPEG Video Coding I, Basic Audio compression techniques, Case study: MPEG Audio compression.

UNIT III**Web 2.0**

What is web 2.0, Search,Content Networks,User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, Atom, JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

UNIT -I V**Rich Internet Applications(RIAs) with Adobe Flash**

Adobe Flash- Introduction, Flash Movie Development, Learning Flash with Hands-on Examples, Publish your flash movie, Creating special effects with Flash, Creating a website splash screen, action script, web sources.

UNIT - V

Rich Internet Applications(RIAs) with Flex 3 - Introduction, Developing with Flex 3, Working with Components, Advanced Component Development, Visual Effects and Multimedia,

Ajax- Enabled Rich Internet Application

Introduction, Traditional Web Applications vs Ajax Applications, Rich Internet Application with Ajax, History of Ajax, Raw Ajax example using xmlhttprequest object, Using XML, Creating a full scale Ajax Enabled application, Dojo ToolKit.

TEXT BOOKS:

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI Learning, 2004
2. Professional Adobe Flex 3, Joseph Balderson, Peter Ent, et al, Wrox Publications, Wiley India, 2009.
3. AJAX, Rich Internet Applications, and Web Development for Programmers, Paul J Deitel and Harvey M Deitel, Deitel Developer Series, Pearson Education.

REFERENCES:

1. Multimedia Communications: Applications, Networks, Protocols and Standards, Fred Halsall, Pearson Education, 2001, rp 2005.
2. Multimedia Making it work, Tay Vaughan, 7th edition, TMH, 2008.
3. Introduction to multimedia communications and Applications, Middleware, Networks, K.R.Rao, Zoran, Dragored, Wiley India, 2006, rp. 2009.

OUTCOMES:

1. After completion of the course the understand the concepts Text and image, Multimedia on the web is sound, music, videos, and animations.
2. The student can use modern web browsers have support for many multimedia applications.
3. After completion of the course the student can use multimedia tools like flex, adobe flash etc.
4. After completion of course the student can design and develop internet applications using multimedia.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**IV Year B.Tech IT – I Sem****L T/P/D C****3 -/-/ 3****(R17A0528) BIG DATA ANALYTICS****Objective:**

- To study about design of Data and Management for Analysis
- To introduce about the work place safety.
- To introduce big data tools & Information Standard formats.
- To study about Machine Learning Algorithms & Data Visualization.

UNIT I**INTRODUCTION TO BIG DATA AND ANALYTICS**

Classification of Digital Data, Structured and Unstructured Data - Introduction to Big Data: Characteristics – Evolution – Definition - Challenges with Big Data - Other Characteristics of Data - Why Big Data - Traditional Business Intelligence versus Big Data - Data Warehouse and Hadoop Environment Big Data Analytics: Classification of Analytics – Challenges - Big Data Analytics important - Data Science - Data Scientist - Terminologies used in Big Data Environments - Basically Available Soft State Eventual Consistency - Top Analytics Tools

UNIT II**INTRODUCTION TO TECHNOLOGY LANDSCAPE**

NoSQL, Comparison of SQL and NoSQL, Hadoop -RDBMS Versus Hadoop - Distributed Computing Challenges – Hadoop Overview - Hadoop Distributed File System - Processing Data with Hadoop - Managing Resources and Applications with Hadoop YARN - Interacting with Hadoop Ecosystem

UNIT III**INTRODUCTION TO MONGODB AND MAPREDUCE PROGRAMMING**

MongoDB: Why Mongo DB - Terms used in RDBMS and Mongo DB - Data Types - MongoDB Query Language

MapReduce: Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression

UNIT IV**INTRODUCTION TO HIVE AND PIG**

Hive: Introduction – Architecture - Data Types - File Formats - Hive Query Language Statements – Partitions – Bucketing – Views - Sub- Query – Joins – Aggregations - Group by and Having - RCFile Implementation - Hive User Defined Function - Serialization and Deserialization. Pig: Introduction - Anatomy – Features – Philosophy - Use Case for Pig - Pig Latin Overview - Pig Primitive Data Types - Running Pig - Execution Modes of Pig - HDFS Commands - Relational Operators - Eval Function - Complex Data Types - Piggy Bank - User-Defined Functions - Parameter Substitution - Diagnostic Operator - Word Count Example using Pig - Pig at Yahoo! - Pig Versus Hive

UNIT V**INTRODUCTION TO DATA ANALYTICS WITH R**

Machine Learning: Introduction, Supervised Learning, Unsupervised Learning, Machine Learning Algorithms: Regression Model, Clustering, Collaborative Filtering, Associate Rule Making, Decision Tree, Big Data Analytics with BigR.

Text Book:

1. Seema Acharya, SubhashiniChellappan, "Big Data and Analytics", Wiley Publications, First Edition,2015

Reference Book:

1. Judith Huruwitz, Alan Nugent, Fern Halper, Marcia Kaufman, "Big data for dummies", John Wiley & Sons, Inc. (2013)
2. Tom White, "Hadoop The Definitive Guide", O'Reilly Publications, Fourth Edition, 2015
3. Dirk Deroos, Paul C.Zikopoulos, Roman B.MeInky, Bruce Brown, Rafael Coss, "Hadoop For Dummies", Wiley Publications, 2014
4. Robert D.Schneider, "Hadoop For Dummies", John Wiley & Sons, Inc. (2012)
5. Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, McGraw Hill, 2012 Chuck Lam, "Hadoop In Action", Dreamtech Publications, 2010

Outcomes:

Upon completion of this course, student shall be able to

1. Design the Data for Data Analytics
2. Understand the work place Safety Features
3. Work on the tools like Hadoop, Scala
4. Obtain fair knowledge on Information standard formats
5. Understand the Machine learning algorithms and visualize the data

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IV Year B.Tech IT – I Sem

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(R17A1208) INFORMATION SECURITY ASSESSMENTS & AUDITS**(Core Elective III)****Objectives:**

- To study the Information security performance and Audit
- To get detailed overview on information Security Audit Tasks, Reports and Post Auditing Actions
- To deal with security vulnerabilities and management
- To introduce to information security assessments and configuration management

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>
<http://csrc.nist.gov/publications/nistpubs/800-40-Ver2/SP800-40v2.odf>

Outcomes:

1. Ability to take up performance metrics and Audit.
2. Students will be able to understand the information Security Audit Tasks, Reports and Post Auditing Actions
3. Students can identify vulnerabilities and perform vulnerability management, information security management and configuration management

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**(R17A0530)DESIGN PATTERNS
(Core Elective IV)****OBJECTIVES:**

1. Design patterns are a systematic approach that focus and describe abstract systems of interaction between classes, objects, and communication flow
2. Given OO design heuristics, patterns or published guidance, evaluate a design for applicability, reasonableness, and relation to other design criteria.
3. 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.
4. 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.

UNIT III:

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

Structural Pattern Part - I: Adapter, Bridge, and Composite

UNIT IV:

Structural Pattern Part - II: Decorator, Façade, Flyweight, Proxy.

Behavioral Patterns Part - I: Chain of Responsibility, Command,

UNIT V:

Behavioral Patterns Part - II: Mediator, Memento, Observer, 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-spdl.
5. Design Patterns Explained by Alan Shalloway, Pearson Education.

OUTCOMES:

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

1. Have a deeper knowledge of the principles of object - oriented design
2. Understand how these patterns related to object - oriented design.
3. Understand the design patterns that are common in software applications.
4. Will able to use patterns and have deeper knowledge of patterns.
5. Will be able to document good design pattern structures.

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**(R17A1209) INFORMATION RETRIEVAL SYSTEMS
(Core Elective IV)****OBJECTIVES**

- Study fundamentals of DBMS, Data warehouse and Digital libraries
- Learn various preprocessing techniques and indexing approaches in text mining
- Know various clustering approaches and study different similarity measures
- Study various search techniques in information retrieval systems
- Know different cognitive approaches used in text retrieval systems and evaluation approaches
- Study retrieval in multimedia systems and know various evaluation measures
- Know about query languages and online IRsystem

UNIT-I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

Information Retrieval System Capabilities: Search, Browse, Miscellaneous

UNIT-II

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

UNIT-III

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT-IV

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT-V

Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

TEXTBOOK:

1. Information Storage and Retrieval Systems: Theory and Implementation by Gerald J. Kowalski, Mark T. Maybury, Second Edition, Kluwer Academic Publishers.

REFERENCES:

1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
2. Modern Information Retrieval By Yates Pearson Education.
3. Information Storage & Retrieval By Robert Korfhage – John Wiley & Sons.

OUTCOMES:

Upon completion of the course, the students are expected to:

1. Recognize the Boolean Model, Vector Space Model, and Probabilistic Model.
2. Understand retrieval utilities.
3. Understand different formatting tags
4. Understand cross-language information retrieval
5. Understand the clustering techniques
6. Determine the efficiency.

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**(R17A1210)SOFT COMPUTING
(Core Elective IV)****OBJECTIVES:**

To provide knowledge about the intelligence (knowledge) based systems, Representation, Processing and control of knowledge artificially using various soft computing techniques.

To provide the knowledge of how to use fuzzy logic in intelligence processes, and practice using MATLAB.

UNIT –I:

Introduction: Approaches to intelligent control, Architecture for intelligent control, Symbolic reasoning system, Rule-based systems, the AI approach, and Knowledge representation - Expert systems.

UNIT –II:

Artificial Neural Networks: Concept of Artificial Neural Networks and its basic mathematical model, McCulloch-Pitts neuron model, simple Perceptron, Adaline and Madaline, Feed-forward Multilayer Perceptron, Learning and Training the neural network, Data Processing: Scaling, Fourier transformation, principal-component analysis and wavelet transformations, Hopfield network, Self-organizing network and Recurrent network, Neural Network based controller.

UNIT –III:

Fuzzy Logic System: Introduction to crisp sets and fuzzy sets, basic fuzzy set operation and approximate reasoning, Introduction to fuzzy logic modeling and control, Fuzzification, Inferencing and Defuzzification, Fuzzy knowledge and rule bases, Fuzzy modeling and control schemes for nonlinear systems, Selforganizing fuzzy logic control, Fuzzy logic control for nonlinear time delay system.

UNIT –IV:

Genetic Algorithm: Basic concept of Genetic algorithm and detail algorithmic steps, Adjustment of free parameters, Solution of typical control problems using genetic algorithm, Concept on some other search techniques like Tabu search and Ant-colony search techniques for solving optimization problems.

UNIT –V:

Applications: GA application to power system optimization problem, Case studies: Identification and control of linear and nonlinear dynamic systems using MATLAB-Neural Network toolbox, Stability analysis of Neural-Network interconnection systems, Implementation of fuzzy logic controller using MATLAB fuzzy-logic toolbox, Stability analysis of fuzzy control systems.

TEXT BOOKS:

1. Introduction to Artificial Neural Systems - Jacek. M. Zurada, Jaico Publishing House, 1999.
2. Neural Networks and Fuzzy Systems - Kosko, B., Prentice-Hall of India Pvt. Ltd., 1994.

REFERENCES:

1. Fuzzy Sets, Uncertainty and Information - Klir G.J. & Folger T.A., Prentice-Hall of India Pvt. Ltd., 1993.
2. Fuzzy Set Theory and Its Applications - Zimmerman H.J. Kluwer Academic Publishers, 1994.
3. Introduction to Fuzzy Control - Driankov, Hellendroon, Narosa Publishers.
3. Artificial Neural Networks - Dr. B. Yagananarayana, 1999, PHI, New Delhi.
4. Elements of Artificial Neural Networks - Kishan Mehrotra, Chelkuri K. Mohan, Sanjay Ranka, Penram International.
5. Artificial Neural Network –Simon Haykin, 2nd Ed., Pearson Education.
6. Introduction Neural Networks Using MATLAB 6.0 - S.N. Shivanandam, S. Sumati, S. N. Deepa, 1/e, TMH, New Delhi.

OUTCOMES:

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

- Understand the necessity and types of Artificial intelligence and approaches to create and process and applications of it.
- Design the Neural networks in intelligence creation, training and use such systems.
- Apply fuzzy logic in intelligence processing and control in soft computing systems
- Understand and use Genetic Algorithms in Soft computing applications.
- Design a fuzzy controller using the MATLAB.

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(R17A0536) COMPUTER FORENSICS**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.

UNIT-II:

Computer Forensics Evidence and Capture: Data Recovery Defined — Data Back-up and Recovery — The Role of Back-up in Data Recovery — The Data-Recovery Solution.

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.

UNIT – III:

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 Forensics analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions

UNIT-IV:

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 –V:

Current Computer Forensic tools: evaluating computer forensic tool needs, computer forensics software tools, computer forensics 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.

TEXT BOOKS

- Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
- Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning

REFERENCE BOOKS

- Real Digital Forensics by Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Addison Wesley Pearson Education
- Forensic Compiling, A Tractitioneris Guide by Tony Sammes and Brian Jenkinson, Springer International edition.
- Computer Evidence Collection & Presentation by Christopher L.T. Brown, Firewall Media.
- Homeland Security, Techniques & Technologies by Jesus Mena, Firewall Media.
- Software Forensics Collecting Evidence from the Scene of a Digital Crime by Robert M. Slade, TMH 2005
- Windows Forensics by Chad Steel, Wiley India Edition

Outcomes:

- Student 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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**IV Year B.Tech IT – I Sem****L T/P/D C****- -/3/- 2****(R17A1281)MOBILE APPLICATION DEVELOPMENT LAB****List Of Experiments**

1. Installation of Java Wireless Toolkit(J2ME)
2. Development Of Hello World Application
3. Development of Menu Creation Application
4. Generation of Menu Events Handling Application
5. Development of Slide Show Application
6. Generation of Image Slide Show
7. Development of Quiz & RMS Application
8. Application for Input Checking
9. Generation of Bar Graph
10. Generation of Pie Chart
11. Client Server App using Datagram
12. Login using Http Connection

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**IV Year B.Tech IT – I Sem****L T/P/D C****- -/3/- 2****(R17A1282) PROGRAMMING FOR APPLICATION DEVELOPMENT LAB****WEEK 1**

Learning to use Visual Studio 2010 IDE

Building Console Application Project

WEEK 2Write a Program to generate the factorial of a given number by using command line argument
Write a Program to generate Fibonacci series

Write a program to generate the temperature conversion

WEEK 3

Write a program to generate Pascal Triangle .

Write a program which asks for a symbol and a width, and displays a triangle of that width, using that number for the inner symbol

WEEK 4

Write a program to find the second highest value in an array

Write a program that accept an array and a number to be searched in an array if found display proper message and its position in a array

WEEK 5

Write a console program to develop tic-tac toe game

Create a function named "ChangeChar" to modify a letter in a certain position (0 based) of a string, replacing it with a different letter ex: ChangeChar("crush",2,'a')

WEEK 6

1. Create a base class, Telephone, and derive a class ElectronicPhone from it. In Telephone, create a protected string member phonetype, and a public method Ring() that outputs a text message like this: "Ringing the <phonetype>." In ElectronicPhone, the constructor should set the phonetype to "Digital." In the Run() method, call Ring() on the ElectronicPhone to test the inheritance.

2. Extend above Exercise to illustrate a polymorphic method. Have the derived class override the Ring() method to display a different message

3. Change the Telephone class to abstract, and make Ring() an abstract method. Derive two new classes from Telephone: DigitalPhone and TalkingPhone. Each derived class should set the phonetype, and override the Ring() method.

WEEK 7

1. Write a program to create interface named test. In this interface the member function is square. Implement this interface in arithmetic class. Create one new class called ToTestInt in this class use the object of arithmetic class.

2. Create an outer class with a function display, again create another class inside the outer class named inner with a function called display and call the two functions in the main class.

WEEK 8

1. Write a program for example of try and catch block. In this check whether the given array size is negative or not.
2. Write a program to illustrate usage of try multiple catch with finally clause
3. Write a program for creation of user defined exception to show whether candidate is eligible to caste vote .

WEEK 9

1. Create a console application that displays current date a time for 10 times with the time interval of 2 seconds(use sleep() method
2. Write a program that demonstrates a high-priority thread using Sleep to give lower-priority threads a chance to run.

WEEK 10

1. create a console application to implement delegate.Create a delegate called strMyDel that takes one string parameter and returns a string.create a class named TestDelegate that contains two non-static methods space() and reverse() having following signature:String Space(String str); space between input characters String Reverse(String str); - reverse the given string
2. Create a console application to get two integer numbers from user and perform addition and multiplication on the input numbers.use the concept of MultiCastEvent

WEEK 11

1. Create a console application to deploy on global assemble cache(using gacutil)
2. Create a bank namespace with various classes (Saving , Current) and implement the namespace in another application

WEEK 12

Create a program to ask the user for data about books (title, author, gender and summary) and store them in a SQLSERVER database

Write a program to update books details using sql procedures

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**(R17A0539) SOFTWARE PROCESS & PROJECT MANAGEMENT
(Core Elective-V)****OBJECTIVES:**

The goals of the course are as follows:

- 6.To learn the importance of software process maturity & understand related concepts.
- 2.Understanding the specific roles within a software organization as related to project and process management
- 3 Understanding the basic infrastructure competences (e.g., process modeling and measurement)
1. Understanding the basic steps of project planning, project management, quality assurance, and process management and their relationships

UNIT I**Software Process Maturity**

Software maturity Framework, Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process. Process Reference Models Capability Maturity Model (CMM), CMMI, PCMM, PSP, TSP.

UNIT II

Software Project Management Renaissance Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way. Life-Cycle Phases and Process artifacts Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model based software architectures.

UNIT III**Workflows and Checkpoints of process**

Software process workflows, Iteration workflows, Major milestones, Minor milestones, Periodic status assessments.

Process Planning

Workbreakdownstructures, Planningguidelines, costandscheduleestimatingprocess, iteration planning process, Pragmatic planning.

UNIT IV**Project Organizations**

Line-of- business organizations, project organizations, evolution of organizations, process automation.

Project Control and process instrumentation

The seven core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, and metrics automation.

UNIT V**CCPDS-R Case Study and Future Software Project Management Practices**

Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

TEXT BOOKS:

1. Managing the Software Process, Watts S. Humphrey, Pearson Education.
2. Software Project Management, Walker Royce, Pearson Education.

REFERENCE BOOKS:

1. Effective Project Management: Traditional, Agile, Extreme, Robert Wysocki, Sixth edition, Wiley India, rp2011.
2. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000
3. Process Improvement essentials, James R. Persse, O'Reilly, 2006
4. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006
5. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
6. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly, 2007
7. Software Engineering Project Management, Richard H. Thayer & Edward Yourdon, 2nd edition, Wiley India, 2004.
8. The Art of Project Management, Scott Berkun, SPD, O'Reilly, 2011.
9. Applied Software Project Management, Andrew Stellman & Jennifer Greene, SPD, O'Reilly, rp2011.
10. Agile Project Management, Jim High smith, Pearson education, 2004.

OUTCOMES:

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

- Apply suitable capability Maturity model for specific scenarios & determine the effectiveness.
- 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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**IV Year B.Tech IT – II Sem****L T/P/D C****4 -/-/ 4****(R17A0537) SEMANTIC WEB AND SOCIAL NETWORKS****(Core Elective-V)****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

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**(R17A1211) GRID COMPUTING
(Core Elective-V)****OBJECTIVES:**

- To introduce the what's, why's and how's of Grid Computing; what is Grid Computing able to do for you today and what will it bring to you in time to come.
- To provide an overview of the basic concepts of Grid Computing;
- To highlight the advantages of deploying Grid Computing;
- To illustrate the practical adoption of a Grid deployment through real life case studies.

UNIT I**CONCEPTS AND ARCHITECTURE**

Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing- Anatomy and Physiology of Grid-Review of Web Services-OGSA-WSRF.

UNIT II**GRID MONITORING**

Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- GridICE – JAMM - MDS-Network Weather Service-R-GMA-Other Monitoring Systems- Ganglia and GridMon

UNIT III**GRID SECURITY AND RESOURCE MANAGEMENT**

Grid Security-A Brief Security Primer-PKI-X509 Certificates-Grid Security-Grid Scheduling and Resource Management-Scheduling Paradigms- Working principles of Scheduling -A Review of Condor, SGE, PBS and LSF-Grid Scheduling with QoS.

UNIT IV**DATA MANAGEMENT AND GRID PORTALS**

Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches-Collective Data Management Services-Federation Services-Grid Portals-First-Generation Grid Portals-Second-Generation Grid Portals.

UNIT V**GRID MIDDLEWARE**

List of globally available Middleware - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features.

TEXT BOOKS

1. Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley & Sons ,2005.

REFERENCES

1. Ian Foster & Carl Kesselman, The Grid 2 – Blueprint for a New Computing Infrastructure,Morgan Kaufman – 2004.
2. Joshy Joseph & Craig Fellenstein, “Grid Computing”, Pearson Education 2004.
3. Fran Berman, Geoffrey Fox, Anthony J.G. Hey, “Grid Computing: Making the Global Infrastructure a reality”, John Wiley and sons, 200 UNIT III

OUTCOMES:

- Students who have successfully completed this course will have full understanding of the following concepts
- To understand the genesis of grid computing, To know the application of grid computing and To learn the technology and tool kits for facilitating grid computing
- Able to appreciate the necessity of grid computing and thus its evaluation, Able to understand where the grid computing could be effectively utilized by illustrations of applications of grid computing and Able to select a proper technology and toolkit for using grid computing

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**(R17A0535) WEB SERVICES
(Core Elective-VI)****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.
5. 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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(R17A1212) E-COMMERCE**(Core Elective-VI)****OBJECTIVES**

- Electronic Commerce provides an overview of the fundamental concepts of online marketing, creating a web site, gaining customers online.
- E-commerce technology and introduces necessary tools to be able to work on the project. in-depth into cryptography, which is the basis of secure electronic transactions, and give more details of some technologies associated with e-commerce
- Integrate the knowledge of foundational functional areas of commerce in order to develop a holistic perspective on the role of IT in organizations

UNIT – I

Introduction and Concepts: Networks and commercial transactions – Internet and other novelties; networks and electronic transactions today, Model for commercial transactions; Internet environment – internet advantage, worlds wide web and other internet sales venues; Online commerce solutions. **Security Technologies:** Insecurity Internet; A brief introduction to Cryptography; Public key solution; Key distribution and certification; prominent cryptographic applications. **Electronic Payment Methods:** Updating traditional transactions; secure online transaction models; online commercial environments; digital currencies and payment systems; Offline secure processing; private data networks.

UNIT – II

Protocols for Public Transport of Private Information: Security protocols; secure protocols; Secure hypertext transfer protocols; Secure sockets layers; Integrating security protocols into the web; Non technical provide.

Electronic Commerce Providers: On-line Commerce options: Company profiles.

Electronic Payment Systems: Digital payment systems; First virtual internet payment system; cyber cash model.

On-line Commerce Environments: Servers and commercial environments; Netscape product line; Netscape commerce server; Microsoft internet explorer and servers; open market.

Digital Currencies: Optional process of Digicash, Ecash Trail; Using Ecash; Smart cards, Electronic Data Interchange; Its basics; EDI versus Internet and EDI over Internet.

Strategies, Techniques and Tools: Internet Strategies: Internet Techniques, Shopping techniques and online selling techniques; Internet tools. Electronic Commerce Online Resources and Guide to the CD-ROM

UNIT – III

ERP – An Enterprise Perspective; Production Finance, Personnel disciplines and their relationship, Transiting environment, MIS Integration for disciplines, Case Study, Information / Workflow, Network Structure, Client Server Integrator System, Virtual Enterprise. ERP – Resource Management Perspective; Functional and Process of Resource. Management, Basic Modules of ERP System-HRD, Personnel Management, Training and Development, Skill Inventory, Material Planning and Control, Inventory, Forecasting, Manufacturing, Production Planning, Production Scheduling, Production

Control, Sales and Distribution, Finance, Resource Management in global scenario, dynamic data management in complex global scenario.

UNIT – IV

ERP – Information System Perspective: Evolution of Application Software Technology Management, EDP, MIS, DBMS, DSS OLAP (Online Analysis and Processing), TP, OAS, KBS, MRP, BPR, SCM, REP, CRM, Information Communication Technology, E-Business, E-Commerce, EDI

UNIT-V

ERP-Key Managerial Issues: Concept Selling, IT Infrastructure, Implication, of ERP Systems on Business Organization, Critical success factors in ERP System, ERP Culture Implementation Issues, Resistance to change, Public Service and Organizations (PSO) Project, ERP Selection issues, Return on Investment, Pre and Post Implementation Issues.

TEXT BOOKS:

1. Pete Loshin and P.A.Murphy, "Electronic Commerce " Jaico Publishing House, 1999.
2. Gary Schneider and James T. Perry, "Electronic Commerce" by Thomson learning, 2001.

REFERENCE BOOKS:

1. Kalakota, "Frontiers of E-Commerce " Addison Wesley long man Publishers, 1999.
2. Kamlesh Bajaj & Debjani Nag, "E-Commerce: The cutting edge of Business" Tata Mcgraw Hill, 2000.
3. Trepper, "E-Commerce strategies", Prentice Hall of India, 2001.
4. S. Sadagopan, "Enterprise Resource Planning", Tata McGraw Hill, 1999.

OUTCOMES: By the end of this course, students should be able to

- Understand the nature of e-Commerce;
- Recognize the business impact and potential of e-Commerce;
- Explain the technologies required to make e-Commerce viable;
- Discuss the current drivers and inhibitors facing the business world in adopting and using ecommerce;
- Explain the economic consequences of e-Commerce;
- Discuss the trends in e-Commerce and the use of the Internet

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**(R17A1213) MIDDLE WARE TECHNOLOGIES
(Core Elective-VI)****OBJECTIVES:**

- To understand the concepts of sensor networks
- To understand the mac and transport protocols for adhoc networks
- To understand security of sensor networks.
- To understand the applications of adhoc and sensor networks.

UNIT-I

Introduction to client server computing: Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming.

UNIT-II

CORBA with Java: Review of Java concept like RMI, RMI API, JDBC. Client/Server CORBA-style, The object web: CORBA with Java.

Introducing C# and the .NET Platform; Understanding .NET Assemblies; Object –Oriented Programming with C#; Callback Interfaces, Delegates, and Events.

UNIT III

Building c# applications: Type Reflection, Late Binding, and Attribute-Based Programming; Object Serialization and the .NET Remoting Layer; Data Access with ADO.NET; XML Web Services.

Core CORBA / Java: Two types of Client/ Server invocations-static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count multi count.

UNIT-IV

Existential CORBA : CORBA initialization protocol, CORBa activation services, CORBAIDL mapping CORBA java- to- IDL mapping, The introspective CORBA/Java object.

Java Bean Component Model : Events, properties, persistency, Introspection of beans, CORBA Beans.

UNIT-V

EJBs and CORBA: Object transaction monitors CORBA OTM's, EJB and CORBA OTM's, EJB container frame work, Session and Entity Beans, The EJB client/server development Process The EJB container protocol, support for transaction EJB packaging EJB design Guidelines.

TEXT BOOKS :

1. Client/Server programming with Java and CORBA Robert Orfali and Dan Harkey, John Wiley & Sons ,SPD 2nd Edition
2. Java programming with CORBA 3rd Edition, G.Brose, A Vogel and K.Duddy, Wiley-dreamtech, India John wiley and sons

REFERENCES :

1. Distributed Computing, Principles and applications, M.L.Liu,
Pearson Education
2. Client/Server Survival Guide 3rd edition Robert Orfali Dan Harkey
& Jeri Edwards, John Wiley & Sons

OUT COMES:

- Ability to understand the concept of ad-hoc and sensor networks, their applications and typical node and network architectures
- Ability to design a protocol for wireless sensor networks
- Ability to evaluate the measurements of protocol performance in wireless sensor networks