



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.

Contact Number: 040-23792146/64634237, E-Mail ID: met2004@gmail.com, website: www.mrcet.ac.in

BACHELOR OF TECHNOLOGY COMPUTER SCIENCE AND ENGINEERING

Course Structure and Syllabus

(Batches admitted from the academic year 2018 - 2019)

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 the 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 with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The cooperation of all the stakeholders 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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

COURSE STRUCTURE

I B. Tech (CSE) – I Semester (I Year I Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0001	English	2	0	0	2	30	70
2	R18A0021	Mathematics – I	3	1	0	4	30	70
3	R18A0013	Applied Physics	3	0	0	3	30	70
4	R18A0302	Engineering Graphics	1	0	4	3	30	70
5	R18A0501	Programming for Problem Solving	3	0	0	3	30	70
6	R18A0082	Engineering/IT Workshop	-	0	4	2	30	70
7	R18A0581	Programming for Problem Solving Lab	-	0	3	1.5	30	70
8	R18A0081	English Language Communication Skills Lab	-	0	3	1.5	30	70
TOTAL			12	1	14	20	240	560

I B. Tech (CSE) – I Semester (I Year II Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0002	Professional English	2	0	0	2	30	70
2	R18A0022	Mathematics – II	3	1	0	4	30	70
3	R18A0012	Engineering Chemistry	3	0	0	3	30	70
4	R18A0502	Object Oriented Programming	3	0	0	3	30	70
5	R18A0201	Basic Electrical Engineering	3	0	0	3	30	70
6	R18A0083	Engineering Physics/Chemistry Lab	-	0	4	2	30	70
7	R18A0582	Object Oriented Programming Lab	-	0	3	1.5	30	70
8	R18A0281	Basic Electrical Engineering Lab	-	0	3	1.5	30	70
9*	R18A0003	Human Values & Societal Perspectives	2	-	-	0	100	-
TOTAL			16	1	10	20	340	560

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

II B. Tech (CSE) – III Semester (II Year I Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0503	Data Structures	3	0	0	3	30	70
2	R18A0461	Analog and Digital Electronics	3	0	0	3	30	70
3	R18A0504	Operating Systems	3	0	0	3	30	70
4	R18A0024	Probability and Statistics	3	0	0	3	30	70
5	R18A0505	Computer Organization	3	0	0	3	30	70
6	R18A0506	Discrete Mathematics	3	0	0	3	30	70
7	R18A0583	Operating Systems Lab	-	0	3	1.5	30	70
8	R18A0584	Data Structures Lab	-	0	3	1.5	30	70
9	R18A0004	Foreign Language: French	2	-	-	0	100	-
		TOTAL	20	0	6	21	340	560

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

II B. Tech (CSE) – IV Semester (II Year II Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0507	Design and Analysis of Algorithms	3	0	0	3	30	70
2	R18A0508	Formal Language and Automata Theory	3	0	0	3	30	70
3	R18A0509	Java Programming	3	0	0	3	30	70
4	R18A0510	Database Management Systems	3	0	0	3	30	70
5	R18A0061	Managerial Economics and Financial Analysis	3	0	0	3	30	70
6	****	Open Elective-I	3	0	0	3	30	70
7	R18A0585	Java Programming Lab	0	0	3	1.5	30	70
8	R18A0586	Database Management Systems Lab	0	0	3	1.5	30	70
9	R18A0014	Environmental Science	2	-	-	0	100	-
		TOTAL	20	0	6	21	340	560

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

III Year B. Tech – V Semester (III Year I Semester)

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0511	Software Engineering	3	0	0	3	30	70
2	R18A0512	Compiler Design	3	0	0	3	30	70
3	R18A0464	Embedded Systems	3	0	0	3	30	70
4	R18A0513	Python Programming	3	0	0	3	30	70
5	R18A1205 R18A0515 R18A0516	Professional Elective-I 1. Artificial Intelligence 2. Pervasive Computing 3. Information Security	3	0	0	3	30	70
6	*****	Open Elective-II	3	0	0	3	30	70
7	R18A0587	Compiler Design Lab	0	0	3	1.5	30	70
8	R18A0588	Python Programming Lab	0	0	3	1.5	30	70
9	R18A0006	Technical Communication & Soft Skills	2	-	-	0	100	-
		TOTAL	20	0	6	21	340	560

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

III Year B. Tech – VI Semester (III Year II Semester)

S.NO	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0517	Web Technologies	3	0	0	3	30	70
2	R18A1207	Mobile Application Development	3	0	0	3	30	70
3	R18A0518	Computer Networks	3	0	0	3	30	70
4	R18A0592	Mini Project	-	-	6	3	30	70
5	R18A0519 R18A0520 R18A0521	Professional Elective-II 1. Computer Graphics 2. Distributed Systems 3. Cyber Security	3	0	0	3	30	70
6	*****	Open Elective-III	3	0	0	3	30	70
7	R18A0589	Web Technologies Lab	0	0	3	1.5	30	70
8	R18A1282	Mobile Application Development Lab	0	0	3	1.5	30	70
9	R18A0007	Indian Constitution	2	-	-	0	100	-
		TOTAL	17	0	12	21	340	560

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

IV Year B. Tech – VII Semester (IV Year I Semester)

S.NO	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0522	Software Testing Methodologies	3	0	0	3	30	70
2	R18A0523	Cloud Computing	3	0	0	3	30	70
3	R18A0524	Data Warehousing and Data Mining	3	0	0	3	30	70
4	R18A0525	Linux Programming	3	0	0	3	30	70
5	R18A0526 R18A0527 R18A0528	Professional Elective-III 1. Machine Learning 2. Mobile Computing 3. Service Oriented Architecture	3	0	0	3	30	70
6	R18A0593	Project-I	-	-	6	3	30	70
7	R18A0590	Linux Programming Lab	-	-	3	1.5	30	70
8	R18A0591	Software Testing Methodologies Lab	-	-	3	1.5	30	70
		TOTAL	15	0	12	21	240	560

IV Year B. Tech – VIII Semester (IV Year II Semester)

S.NO		SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0529	Big Data Analytics	3	0	0	3	30	70
2	R18A0530 R18A0531 R18A0532	Professional Elective-IV 1. Parallel and Distributed computing 2. Internet of Things 3. Advanced Algorithms	3	0	0	3	30	70
3	R18A0533 R18A0534 R18A0535	Professional Elective-V 1. Soft Computing 2. Block Chain Technology 3. Image Processing	3	0	0	3	30	70
4	R18A0594	Project-II	-	-	12	6	60	140
		TOTAL	9	0	12	15	150	350

OPEN ELECTIVE 1

S.NO.	SUBJECT CODE	SUBJECT
1	R18A0451	DIGITAL ELECTRONICS
2	R18A0551	DATA BASE SYSTEMS
3	R18A0553	DATA STRUCTURES USING PYTHON
4	R18A0351	INTELLECTUAL PROPERTY RIGHTS
5	R18A0352	GREEN ENERGY SYSTEMS
6	R18A0555	DATA VISUALIZATION

OPEN ELECTIVE 2

S.NO.	SUBJECT CODE	SUBJECT
1	R18A1253	MANAGEMENT INFORMATION SYSTEMS
2	R18A0552	INTRODUCTION TO JAVA PROGRAMMING
3	R18A1252	SOFTWARE PROJECT MANAGEMENT
4	R18A0353	ENTERPRISE RESOURCE PLANNING
5	R18A0354	NANO TECHNOLOGY

OPEN ELECTIVE 3

S.NO.	SUBJECT CODE	SUBJECT
1	R18A0452	ROBOTICS & AUTOMATION
2	R18A0453	INTERNET OF THINGS & ITS APPLICATIONS
3	R18A1253	SOFTWARE TESTING TECHNIQUES
4	R18A0355	TOTAL QUALITY MANAGEMENT
5	R18A0251	ELECTRICAL SYSTEMS & APPLICATIONS
6	R18A0554	OPERATING SYSTEM CONCEPTS

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH- I- YEAR- I-SEM-CSE

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

(R18A0001) ENGLISH

INTRODUCTION:

English is a global language which is a means to correspond globally. Keeping in account of its vital role in the global market, emphasis is given to train the students to acquire language and communication skills. The syllabus is designed to develop and attain the competency in communicative skills.

The lectures focus on the communication skills and the selected act as resources for the teachers to develop the relevant skills in the students. The lessons stimulate discussions and help in comprehending the content effectively. The focus is on skill development, nurturing ideas and practicing the skills.

OBJECTIVES:

1. To enable students to enhance their lexical, grammatical and communicative competence.
2. To equip the students to study the academic subjects with better perspective through theoretical and practical components of the designed syllabus.
3. To familiarize students with the principles of writing to ensure error-free writing.
4. To know to use sentence structure effectively and to understand how to convert ideas logically within a sentence.
5. To expose students to various techniques of reading skills which hone their comprehensive skills.

SYLLABUS:

Unit –I

Chapter entitled “***The Road Not Taken***” by Robert Frost (8 hrs)

Grammar – Tenses and Punctuation (Sequences of Tenses)

Vocabulary – Word Formation - Prefixes and Suffixes

Writing – Paragraph writing – I (Focusing on Tenses and Punctuations)

Reading – Techniques for effective reading – Reading Exercise – Type 1

Unit –II

Chapter entitled “***Abraham Lincoln’s Letter to His Son’s Teacher***” (7hrs)

Grammar – Voices, Transitive and Intransitive Verbs

Vocabulary – Synonyms, Antonyms

Writing – E-mail Writing, Letter Writing (complaints, requisitions, apologies).

Reading – Skimming, scanning- Reading Exercise – Type 2

Unit – III

Chapter entitled “**War**” by L. Pirandello (6 hrs)

Grammar – Degrees of Comparison, Prepositions

Vocabulary – Phrasal Verbs

Writing – Essay Writing (Introduction, body and conclusion)

Reading – Comprehension- Reading Exercise – Type 3

Unit – IV

Chapter entitled “**J K Rowling’s Harvard Speech**” (6 hrs)

Grammar – Articles, Misplaced Modifiers

Vocabulary – One-Word Substitutes

Writing – Précis Writing

Reading – Intensive and Extensive reading - Reading Exercise – Type 4

Unit – V

Sentence Structures (phrases and clauses) (7 hrs)

Grammar – Subject-Verb Agreement, Noun-Pronoun Agreement

Vocabulary – Commonly Confused Words

Writing – Memo Writing

Reading – Identifying Errors - Reading Exercise – Type 5

* Exercises apart from the text book shall also be used for classroom tasks.

REFERENCE BOOKS:

1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan. 2007
3. On Writing Well. William Zinsser. Harper Resource Book. 2001
4. Study Writing. Liz Hamp-Lyons and Ben Heasley. Cambridge University Press. 2006.
5. Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
6. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

OUTCOMES:

Students will be able to:

1. write formal or informal letters and applications for different purposes.
2. select and extract relevant information through skimming and scanning.
3. utilize the strategy of brainstorming in preparing analytical, argumentative and expository essays.
4. draft concise emails following professional email etiquette.
5. enhance their grammatical competency by spotting errors.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B. TECH- I- YEAR- I-SEM–CSE****L T/P/DC****3 1/-/ 4****(R18A0021) MATHEMATICS -I****Course Objectives: To learn**

1. The concept of rank of a matrix which is used to know the consistency of system of linear equations and also to find the eigen vectors of a given matrix.
2. Finding maxima and minima of functions of several variables.
3. Applications of first order ordinary differential equations. (Newton's law of cooling, Natural growth and decay)
4. How to solve first order linear, non linear partial differential equations and also method of separation of variables technique to solve typical second order partial differential equations.
5. Solving differential equations using Laplace Transforms.

UNIT I: Matrices

Introduction, types of matrices-symmetric, skew-symmetric, Hermitian, skew-Hermitian, orthogonal, unitary matrices. Rank of a matrix - echelon form, normal form, consistency of system of linear equations (Homogeneous and Non-Homogeneous). Eigen values and Eigen vectors and their properties (without proof), Cayley-Hamilton theorem (without proof), Diagonalisation.

UNIT II: Functions of Several Variables

Limit continuity, partial derivatives and total derivative. Jacobian-Functional dependence and independence. Maxima and minima and saddle points, method of Lagrange multipliers, Taylor's theorem for two variables.

UNIT III: Ordinary Differential Equations

First order ordinary differential equations: Exact, equations reducible to exact form. Applications of first order differential equations - Newton's law of cooling, law of natural growth and decay.

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.

UNIT IV: Partial Differential Equations

Introduction, formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order Lagrange's linear 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

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, 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:

- i) Higher Engineering Mathematics by B V Ramana ., Tata McGrawHill.
- ii) Higher Engineering Mathematics by B.S. Grewal, KhannaPublishers.
- iii) Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.

REFERENCE BOOKS:

- i) Advanced Engineering Mathematics by R.K Jain & S R K Iyenger, Narosa Publishers.
- ii) Advanced Engineering Mathematics by Michael Green Berg, Pearson Publishers .
- iii) Engineering Mathematics by N.P Bali and Manish Goyal.

Course Outcomes: After learning the concepts of this paper the student will be able to

1. Analyze the solution of the system of linear equations and to find the Eigen values and Eigen vectors of a matrix.
2. Find the extreme values of functions of two variables with / without constraints.
3. Solve first and higher order differential equations.
4. Solve first order linear and non-linear partial differential equations.
5. Solve differential equations with initial conditions using Laplace Transform.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B.TECH – I YEAR – I SEM-CSE****L T/P/DC****3 -/-/ 3****(R18A0011) APPLIED PHYSICS****COURSE OBJECTIVES:**

1. To understand dual nature of the matter and behavior of a particle quantum mechanically.
2. To understand band structure of the solids and classification of materials.
3. To be able to distinguish pure, impure semiconductors and characteristics of PN junction diode.
4. To understand dielectric and magnetic properties of the materials and enable them to design and apply in different fields.
5. To be able to distinguish ordinary light with a laser light and realize the transfer of light through optical fibers.

UNIT – I**QUANTUM MECHANICS****(7Hours)**

Wave nature of particles, deBroglie's hypothesis, matter waves, Heisenberg's uncertainty principle, Davisson and Germer's experiment, G.P Thomson experiment, Schrodinger time-independent wave equation-significance of wave function, particle in one dimensional square well potential.

UNIT – II**ELECTRONIC MATERIALS****(7Hours)**

Free electron theory, Fermi level, Density of states, Periodic potential-Bloch's theorem, Kronig – Penny model, E – K diagram, Effective mass, Origin of energy bands in solids, Classification of materials on the basis of energy bands: Metals, semi conductors and insulators.

UNIT – III**SEMICONDUCTOR PHYSICS****(7 Hours)**

Intrinsic and extrinsic semiconductors, Direct and indirect band gap semi conductors, Carrier concentration in intrinsic and extrinsic semi conductors. Dependence of Fermi level on carrier concentration and temperature, carrier transport: diffusion and drift, Formation of PN junction, V-I characteristics of PN diode, energy diagram of PN diode, Hall experiment, semiconductor materials for optoelectronic devices - LED, Solar cell.

UNIT-IV**DIELECTRICS AND MAGNETIC PROPERTIES OF MATERIALS (10 Hours)**

Dielectrics: Introduction, Types of polarizations (Electronic and Ionic) and calculation of their polarizabilities, internal fields in a solid, Clausius-Mossotti relation.

Magnetism: Introduction, Bohr magneton, classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Properties of anti-ferro and ferri magnetic materials, Hysteresis curve based on domain theory, Soft and hard magnetic materials.

UNIT-V: (9Hours)**LASERS & FIBER OPTICS**

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

Introduction to optical fiber, Construction and working principle of an Optical Fiber, Acceptance angle and Numerical aperture, Types of Optical fibers - Mode and Propagation through step and graded index fibers, Attenuation, Optical Fiber in Communication System, Applications of optical fibers.

COURSE OUTCOMES: After completion of studying Applied Physics the student is able to,

1. Know the basic principles of quantum mechanics and the importance of behavior of a particle.
2. Realize the importance of band structure of solids and their applications in various electronic devices.
3. Learn concentration estimation of charge carriers in semiconductors and working principles of PN diode.
4. Learn dielectric, magnetic properties of the materials and apply them in material technology.
5. Learn the principles and production of LASER beams and transfer of information by optical fiber communication systems.

TEXT BOOKS:

1. Engineering Physics by Arumugam, Anuradha publications.
2. Engineering Physics- B.K.Pandey, S.Chaturvedi, Cengage Learning.

REFERENCES:

1. Engineering Physics – R.K. Gaur and S.L.Gupta, Dhanpat Rai Publishers.
2. Engineering Physics, S Mani Naidu- Pearson Publishers.
3. Engineering physics 2nd edition –H.K.Malik and A.K.Singh.
4. Engineering Physics – P.K. Palaniswamy, Scitech publications.
5. Physics by Resnick and Haliday.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B. TECH – I- YEAR –ISEM-CSE****L T/P/D C****1 -/4-/ - 3****(R18A0301) ENGINEERING GRAPHICS****Course Objectives:**

1. Learn to sketch and take field dimensions.
2. Learn to take data and transform it into graphic drawings.
3. Learn basic engineering drawing formats

UNIT – I

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

- a) Polygons – Construction of regular polygons (General Method only)
- b) Conic Sections (General Method only- Eccentricity Method)
- c) Cycloid, Epicycloid and Hypocycloid
- d) 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.

Course Outcomes:

1. Student's ability to convert sketches to engineered drawings will increase.
2. Students will be able to draw orthographic projections and sections.
3. Student's ability to perform basic sketching techniques will improve.

TEXT BOOKS

1. Engineering Drawing, Special Edition-MRCET, McGraw Hill Publishers, 2017.
2. Engineering Drawing, N.D. Bhatt
3. Engineering Drawing by K.VenuGopal & V.Prabu Raja New Age Publications.

REFERENCES

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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B. TECH – I- YEAR –I SEM- CSE**

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

(R18A0501) PROGRAMMING FOR PROBLEM SOLVING**COURSE OBJECTIVES**

1. To understand the various steps in Programdevelopment.
2. To understand the basic concepts in C ProgrammingLanguage.
3. To learn how to write modular and readable CPrograms
4. To learn to write programs (using structured programming approach) in C to solve problems.

UNIT - I

Introduction to Computing – Computer Systems-Hardware and Software, Computer Languages, Algorithm, Flowchart, Representation of Algorithm and Flowchart with examples.

Introduction to C– History of C, Features of C, Structure of C Program, Character Set, C Tokens-Keywords, Identifiers, Constants, Variables, Data types, Operators.

UNIT-II

Statements-Selection statements (Decision Making)- if and switch statements with examples, Repetition statements (loops)- while, for, do-while statements with examples, Unconditional statements- break, continue, goto statements with examples.

UNIT – III

Functions-Designing Structured Programs, Types of Functions-User defined functions, Standard functions, Categories of functions, Parameter Passing techniques, Storage classes, Recursion.

UNIT-IV

Arrays- Declaration and Initialization, One dimensional Arrays, Two dimensional Arrays.

Strings- Declaration and Initialization, String Input / Output functions, String manipulation functions.

UNIT-V

Pointers- Introduction, Definition and Declaration of pointers, address operator, Pointer variables, Pointers with Arrays.

Structures- Introduction, Declaration and Initialization, Array of Structures, Unions.

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.

COURSE OUTCOMES:

1. Demonstrate the basic knowledge of computer hardware and software.
2. To formulate simple algorithms for arithmetic and logical problems.
3. To translate the algorithms to programs (in C language).
4. To test and execute the programs and correct syntax and logical errors.
5. Ability to apply solving and logical skills to programming in C language and also in other languages.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B. TECH – I- YEAR –I SEM- CSE**

L	T/P/D	C
-	-/-/4	2

(R18A0082)ENGINEERING WORKSHOP/ IT WORKSHOP**COURSEOBJECTIVES:**

1. Student able to learn about different tools used in the lab
2. Student able to learn about foundry, welding, plumbing, house wiring and Tin smithy operations
3. Student able to learn about different Carpentry and Fitting tools

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. BlackSmithy
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.
Workshop Manual / Venkat Reddy/ BS Publications/Sixth Edition

COURSE OUTCOMES:

1. Students can understand different machine shop operations
2. Students can understand Foundry, welding, plumbing, house wiring and Tin smithy operations
3. Student learned about metal cutting processes

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B. TECH- I YEAR-ISEM-CSE****LT/P/DC****- -/ 4 /-2****(R18A0082)IT WORKSHOP LAB****OBJECTIVES:**

1. 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 PowerPoint
2. PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows; In addition hardware and software level troubleshooting process, tips and tricks would be covered.
3. Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.
4. Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal websites using the Microsoft suite of office tools.
5. HTML introduction for creating static webpages

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:

Assembling and disassembling of PC

Week 3:

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

Week 4: Hardware Troubleshooting

Students have to be given a PC which does not boot due to improper assembly or defective peripherals 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.

Week 5: INTERNET & WEB BROWSERS

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 6: MICROSOFT WORD**

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.

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.

Week 7: MICROSOFT EXCEL

Excel Orientation: The importance of MS office 2007/10 tool Excel as a Spreadsheet tool, Accessing, overview of toolbars, saving excel files, Using help and resources.

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

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

Week 8: MICROSOFT POWER POINT

Basic power point utilities and tools which helpful to create basic power point presentation. Topic covered during this includes PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both Latex and Power point.

Create the presentation using the following tools:

Formatting: Color, font type, font size, font style etc.

Header and Footer

Bullets and Numbering

Drawing Toolbar: Auto shapes, Textboxes, etc

Design Template

Introduction to custom animation.

b) Create a presentation to conduct a creativity session using the following tools:

1. Slide transition
2. Master slideview
3. Insert picture – clipart,image
4. Actionbutton
5. Drawing tool bar – lines,arrows
6. Hyperlink
7. Custom animation
8. Hide slide
9. Wash out

Week 9: HTML

Introduction to HTML & Basic HTML Tags: Understand what are the tasks used for creation of website

Designing a static web page: Understand how to create a webpage

OUTCOMES:

1. The Students are able to identify the major components of a computer and its basic peripherals. They are capable of assembling a personal computer, and can perform installation of system software like MS Windows and required device drivers.
2. Students can detect and perform minor hardware and software level troubleshooting.
3. The Students are capable of working on Internet & World Wide Web and can make effective usage of the internet for academics.
4. The Students develop ability to prepare professional word documents, excel spread sheets and power point presentations using the Microsoft suite of office tools.
5. The students are able to create a static webpage's using HTML.

Text Books:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education
2. PC Hardware and A+ Handbook-Kate J. Chase PHI (Microsoft)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**B. TECH- I YEAR-ISEM-CSE****L T/P/D C****- -/3/- 1.5****(R18A0581) PROGRAMMING FOR PROBLEM SOLVINGLAB****OBJECTIVES:**

1. Understand the basic concept of C Programming, and its different modules that include conditional and looping expressions, Arrays, Strings, Functions, Pointers, and Structures.
2. Acquire knowledge about the basic concept of writing a program.
3. Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
4. Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
5. Role of Functions involving the idea of modularity.
6. 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.

Week 2:

- a) Write a C program to generate the first n terms of the Fibonacci sequence.
- b) Write a C program to generate prime numbers from 1 to n.
- c) Write a C program to check whether given number is Armstrong Number or not.

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 to 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 sum of integer array elements using pointers.

Week 13:

- a) Write a C program to Calculate Total and Percentage marks of a student using structure.

Week 14:

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:

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**B. TECH- I YEAR-ISEM-CSE****L T/P/D C
-/ -/ 3 -/ 1.5****(R18A0081)ENGLISH LANGUAGE COMMUNICATION SKILLS LAB**

The Language Lab focuses on phonetic knowledge of the English language and its use in everyday situations and contexts.

OBJECTIVES:

1. To expose students to a variety of self-instructional, learner-friendly modes of language learning
2. To enable students to learn accurate pronunciation through stress on word accent, intonation and rhythm.
3. To enable students to overcome public speaking anxiety and equip them to become employable.
4. To familiarize students with formal telephonic expressions by means of appropriate tone.
5. To foster sentence-level and holistic understanding of the context through active listening.

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- Greetings – Taking Leave – Introducing Oneself and Others.

UNIT –II

CALL Lab: Syllabification - Stress &Intonation- Rules of Stress Markings and Intonation

ICS Lab: Situational Dialogues/Role Plays - Making Requests and Seeking Permissions.

UNIT –III

CALL Lab: Listening Activities (Its Importance – Purpose- Process- Listening for General and Specific Details.)

ICS Lab: Communication at Work Place - Professional Etiquettes, Telephone Etiquette.

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 –IVProcessor
 - a)Speed –2.8GHZ
 - b)RAM –512 MBMinimum
 - c)HardDisk –80GB
- 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

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practicalsessions.
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 otherinstitution.

OUTCOMES:

Students will be able to:

1. understand the importance of learning phonetics.
2. learn how to pronounce words using phonetictranscription.
3. know the importance of speaking English with rhythm andintonation.
4. effectively participate in JAMsession.
5. use polite expressions in all formalsituations.
6. effectively communicate throughtelephone.

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B. TECH- I YEAR-IISEM-CSE

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(R18A0002) PROFESSIONAL ENGLISH

INTRODUCTION:

English is a tool for global communication and is the dominant language which is sweeping almost all the fields in the world. It has become a necessity for people to speak in English comfortably, if they want to enter the global workforce. Hence, the course is designed to help the students to meet the global standards. Each unit focuses on English skill-set to improve: Interview skills, giving presentations and professional etiquette.

OBJECTIVES:

1. To enrich students to express themselves appropriately and fluently in professional contexts.
2. To enhance their employability through regular participation in group discussions and interview skills.
3. To lay foundation with writing strategies for the future workplace needs.
4. To acquaint students with different components of professional presentation skills.
5. To equip students with necessary training in listening to comprehend dialects of English language.

SYLLABUS:

UNIT-I

(7 hrs)

Listening	- Bill Gate's TED talk on Solving Big Problems
Speaking	- Description of Pictures, Places, Objects and Persons
Grammar	- Finite and Non-finite verbs
Vocabulary	- Business Vocabulary
Writing	- Paragraph Writing

Unit –II

(8 hrs)

Listening	- Google CEO Sundar Pichai's Speech I/O 2017 Keynote
Speaking	- Oral presentations
Grammar	- Transformation of Sentences
Vocabulary	- Idioms
Writing	- Abstract Writing

Unit –III

(8 hrs)

Listening	- Sample Interviews (videos)
Speaking	- Mock Interviews
Grammar	- Direct and Indirect Speech

- Vocabulary - Standard Abbreviations (MiniProject)
Writing - Job applications I (CoverLetter)

Unit –IV (6 hrs)

- Listening - Telephonic Interviews
Speaking - Telephonic Expressions
Grammar - Auxiliary verbs
Vocabulary - Word Analogy-I
Writing - Job Application II (Resume)

Unit – V (5 hrs)

- Listening - Tanmay Bhakshi's ITU interview
Speaking - Professional Etiquette
Grammar - Common Errors
Vocabulary - Word Analogy-II
Writing - Report Writing

* Exercises apart from the text book shall also be referred for classroom tasks.

REFERENCE BOOKS:

1. Practical English Usage. Michael Swan. OUP.1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007
3. On Writing Well. William Zinsser. Harper Resource Book.2001
4. Study Writing. Liz Hamp-Lyons and Ben Heasley. Cambridge University Press.2006.
5. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press.2011.
6. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

OUTCOMES:

Students will be able to:

1. draft coherent and unified paragraphs with adequate supporting details.
2. demonstrate problem solving skills, decision-making skills, analytical skills.
3. comprehend and apply the pre-interview preparation techniques for successful interview.
4. achieve expertise in writing resume and cover letter formats.
5. understand the steps of writing 'Reports and Abstract'.

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**B. TECH- I YEAR-IISEM-CSE****L T/P/D C****3 1/-/ - 4****(R18A0022)MATHEMATICS-II****OBJECTIVES:**

1. 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.
2. To learn the concepts curve fitting, numerical integration and numerical solutions of first order ordinary differentialequations.
3. Evaluation of improper integrals using Beta and Gammafunctions.
4. Evaluation of multipleintegrals.
5. 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 volumeintegrals.

UNIT – I: Solutions of algebraic, transcendental equations and Interpolation

Solution of algebraic and transcendental equations: Introduction, Bisection Method, Method of false position, Newton Raphson method and their graphical interpretations.

Interpolation: Introduction, errors in polynomial interpolation, Finite differences - Forward differences, backward differences, central differences. Newton's formulae for interpolation, Gauss's central difference formulae. Interpolation with unevenly spaced points - Lagrange's Interpolation.

UNIT – II: Numerical Methods

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

Numerical solution of ordinary differential equations: Solution by Taylor's series method, Euler's method, Euler's modified method, Runge-Kutta fourth order method.

Curve fitting: Fitting a straight line, second degree curve, exponential curve, power curve by method of least squares.

Unit III: Beta and Gamma functions

Introduction of improper integrals- Beta and Gamma functions - Relation between them, their properties, Evaluation of improper integrals using Beta and Gamma functions.

Unit IV: Double and Triple Integrals

Double and triple integrals (Cartesian and polar), change of order of integration in double integrals, Change of variables (Cartesian to polar).

Unit V: Vector Calculus

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

TEXT BOOKS:

- i) Higher Engineering Mathematics by B V Ramana ., Tata McGrawHill.
- ii) Higher Engineering Mathematics by B.S. Grewal, KhannaPublishers.
- iii) Mathematical Methods by S.R.Klyenger, R.K.Jain, NarosaPublishers.

REFERENCE BOOKS:

- i) Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
- ii) Advanced Engineering Mathematics by Michael Greenberg –Pearsonpublishers.
- iii) Introductory Methods of Numerical Analysis by S.S. Sastry, PHI

Course Outcomes: After learning the contents of this paper the student must be able to

1. Find the roots of algebraic, non algebraic equations and predict the value of the data at an intermediate point from a given discrete data.
2. Find the most appropriate formula for a guesses relation of the data variables using curve fitting and this method of analysis data helps engineers to understand the system for better interpretation and decision making.
3. Find a numerical solution for a given differentialequation.
4. Evaluate multiple integrals and to have a basic understanding of Beta and Gamma functions..
5. Evaluate the line, surface, volume integrals and converting them from one to another using vector integral theorems.

MALLAREDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.TECH- I- YEAR- II-SEM –CSE

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(R18A0013) ENGINEERING CHEMISTRY

COURSE OBJECTIVES:

1. To apply the electrochemical principles in batteries, understand the fundamentals of corrosion and development of different techniques in corrosion control.
2. To analyze microscopic chemistry in terms of atomic and molecular orbitals.
3. To analyze water for its various parameters and its significance in industrial and domestic applications.
4. To impart the knowledge of organic reaction mechanisms which are useful for understanding the synthesis of organic compounds.
5. To analyze different types of fuels and their applications in various engineering fields.

Unit-I: Electrochemistry and Corrosion (12 lectures)

Electrochemistry: Introduction to electrochemistry; Electrochemical cells - electrode potentials, construction and working of a galvanic cell, EMF and its applications - potentiometric titration; Nernst equation and its applications; Batteries - classification of batteries, primary cell - lithium cells and secondary cells - lead acid battery and lithium ion battery; Fuel cells - H_2 - O_2 fuel cell, its applications and advantages.

Corrosion: Introduction, causes and effects of corrosion; Theories of corrosion- chemical (oxidation corrosion) and electrochemical corrosion, mechanism of electrochemical corrosion; Corrosion control methods - cathodic protection - sacrificial anodic protection & impressed current cathodic protection; Methods of application of metallic coatings - hotdipping - galvanizing & tinning, electroplating (Cu plating) and electroless plating (Ni plating) - advantages and applications of electroplating/electroless plating.

Unit -II: Atomic and Molecular Structure (8 lectures)

Atomic and molecular orbitals; Postulates of molecular orbital theory - Linear Combination of Atomic Orbitals (LCAO); Molecular orbitals of diatomic molecules, molecular orbital energy level diagrams of N_2 and O_2 ; Metallic bonding, limitations of Valence Bond Theory (VBT).

Crystal field theory (CFT) – Salient features of CFT, crystal field splitting of transition metal ion d-orbitals in tetrahedral and octahedral geometries.

Unit -III: Water and its Treatment (6 lectures)

Hardness of water- Types and units of hardness; Estimation of hardness of water by EDTA method; Softening of water by Ion exchange process; Potable water- specifications, methods of disinfection-chlorination and ozonation; Desalination of water by Reverse Osmosis.

Unit-IV: Organic Reactions (10 lectures)

Introduction to Organic Reactions - Types of reactions; Substitution - Nucleophilic substitution reactions, mechanism of S_N1 and S_N2 ; Addition - electrophilic and nucleophilic addition reactions; addition of HBr to propene - Markownikoff and Anti-Markownikoff's additions; Elimination reactions - dehydrohalogenation of alkyl halides; Oxidation reactions - oxidation of alcohols using $KMnO_4$ and chromic acid; Reduction reactions - reduction of carbonyl compounds using $LiAlH_4$ and $NaBH_4$.

Unit-V: Energy Sources (8 lectures)

Fuels- Definition, classification (solid, liquid & gaseous fuels) - characteristics of a good fuel; Coal - analysis of coal - proximate and ultimate analysis and their significance; Petroleum - refining, knocking - octane and cetane number, cracking - fluid bed catalytic cracking; Natural gas, LPG, CNG - constituents, characteristics and uses.

Suggested Text Books:

1. Engineering Chemistry by P.C. Jain & M. Jain, Dhanpat Rai Publishing Company (P) Ltd, 16th Edition, New Delhi.
2. Engineering Chemistry by Prasanta Rath, B.Rama Devi, C. H. Venkata Ramana Reddy, Subhendu Chakroborty, Cengage Learning Publication, India Private Limited, 2018.

Reference Books:

1. University Chemistry by B. H. Mahan, Pearson, IV Edition.
2. Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publishing Company (P) Ltd, New Delhi.
3. Reactions, Rearrangements and Reagents by S.N. Sanyal, Bharati Bhavan Publishers.

COURSE OUTCOMES: The basic concepts included in this course will help the student to:

1. 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.
2. Achieve basic concepts of atomic, molecular and electronic changes related to conductivity and magnetism.
3. Familiarize the student with the fundamentals of the treatment technologies and the considerations for its design and implementation in water treatment plants.
4. Gain knowledge on synthesis of organic compounds by using different reaction mechanisms.
5. Comprehend the types of fuels, characteristics and combustion systems with emphasis on engineering applications.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**B.T ECH- I- YEAR- II-SEM–CSE****L T/P/D C****3 -/-/ 3****(R18A0502)OBJECT ORIENTED PROGRAMMING****OBJECTIVES:**

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

Unit - I

Introduction to Object Oriented Programming: Object oriented paradigm-Differences between Object Oriented Programming and Procedure oriented programming, Basic concepts of Object Oriented Programming, Benefits of OOP, Structure of a C++ program, namespace, Data types, C++ tokens, Identifiers, Variables, Constants, Operators, Control structures &Loops.

Functions: Introduction to functions, Inline functions, Command Line arguments.

Unit - II**Classes and Objects:**

Introduction of Classes: Class Definition, Defining a Members, Objects, Access Control, Class Scope, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Friend Functions.

Constructors and Destructors:

Introduction to Constructors, Default Constructors, Parameterized Constructors, Copy Constructors, Destructors.

Unit - III

Inheritance: Introduction to inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi level Inheritance, Hierarchical Inheritance, Hybrid Inheritance.

Pointers: Introduction to Memory management, new operator and delete operator, Pointers to objects, Pointers to Derived Classes.

Unit - IV**Virtual Functions and Polymorphism:**

Polymorphism, Compile time polymorphism: Overloading- Function Overloading, Operator overloading, Run time polymorphism, Virtual Functions.

Exception handling:

Basics of Exception Handling, Types of exceptions, Exception Handling Mechanism, Throwing and Catching Mechanism.

Unit -V**Templates:**

Introduction to Templates, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters, Standard Template Library Classes: STL Container classes- Array class, Vector, stack, queue, STL Algorithm classes- Sort, reverse, max, min.

Application Development using C++

Text Books:

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

References:

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**B.TECH- I- YEAR- II-SEM–CSE****LT/P/DC 3-****/-/- 3****(R18A0201) BASIC ELECTRICAL ENGINEERING****OBJECTIVE:**

1. This course introduces the basic concepts of electrical circuits & networks and their analysis which is the foundation for all the subjects in the electrical engineering discipline.
2. The emphasis is laid on the basic elements in electrical circuits.
3. Analysis of Circuits Which Includes Network Analysis & Network Theorems.
4. Analysis of Single Phase AC Circuits, Magnetic Circuits and Basic Treatment of Single Phase Transformers and DC Machines is introduced.

UNIT –I:

Introduction to Electrical Circuits: Concept of Circuit and Network, Types of elements, R-L-C Parameters, Independent and Dependent sources, Source transformation and Kirchhoff's Laws

UNIT –II:

Network Analysis: Network Reduction Techniques- Series and parallel connections of resistive networks, Star-to-Delta and Delta-to-Star Transformations for Resistive Networks, Mesh Analysis, and Nodal Analysis, Network Theorems: Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem and Superposition theorem, Illustrative Problems.

UNIT-III:

Single Phase A.C. Circuits: Average value, R.M.S. value, form factor and peak factor for sinusoidal wave form, 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, Illustrative Problems.

UNIT–IV:

Electrical Machines (elementary treatment only):

Single phase transformers: principle of operation, constructional features and emf equation. DC Generator: principle of operation, constructional features, emf equation. DC Motor: principle of operation, Back emf, torque equation.

UNIT –V:

Electrical Installations:

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption and battery backup.

TEXT BOOKS:

1. Engineering Circuit Analysis - William Hayt, Jack E. Kemmerly, S M Durbin, Mc Graw Hill Companies.
2. Electric Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.
3. Electrical Machines – P.S.Bimbra, Khanna Publishers.

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. Electrical Machines by I.J. Nagrath & D. P. Kothari, Tata Mc Graw-Hill Publishers.

OUTCOME:

At the end of this course the student would get

1. A thorough knowledge of the basic RLC circuit elements
2. Understanding of the basic concepts of networks and circuits with RLC
3. Concepts of single phase AC circuits
4. Network theorems and their application to solve problems in Network analysis
5. Fundamentals Of Constructional Details And Principle Of Operation Of DC Machines And Transformers

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B.TECH- I YEAR – II- SEM-CSE****L T/P/D C****- -/4/- 2****(R18A0083) ENGINEERING PHYSICS/ CHEMISTRY LAB****(Any 8 experiments compulsory)****OBJECTIVES**

1. The engineering students are exposed in physics lab to understand physical parameters practically.
2. The list of experiments enables the students to know different branches like mechanics, optics and electronics.
3. The students are thoroughly trained in learning practical skills by completing all the experiments in physics lab.

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

LIST OF EXPERIMENTS: (Any eight experiments compulsory)

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

Reference practical physics books:

1. Practical physics by **Dr. Aparna**, V.G.S. publications.
2. Engineering physics practical lab manual – **MRCET**.

OUTCOMES

1. The students learn the concepts of error, analyze and try to formulate new solutions to the problems related to engineering physics.
2. B.Tech students basically learning the mechanical behavior of the wire and practically determining the elastic constant. Transverse and longitudinal waves are practically

studied. Variation of the magnetic fields along with terrestrial magnetism is practically studied.

3. Dispersion of the composite light is clearly observed by the students. Wavelengths of the source of light/laser are determined experimentally.
4. Opto electronic devices and their working are practically realized by the students. In addition the functioning of optical fiber is practically studied.
5. The students learn experimental skills to design new experiments suitable for requirements in different fields (industrial, medical, scientific field etc.)

R18A0083) ENGINEERING CHEMISTRY LAB
(Any Eight Experiment Compulsory)

OBJECTIVES

This course on chemistry lab is designed with 10 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

1. Provide the students with a solid foundation in chemistry laboratory required to solve engineering problems.
2. Practical implementation of fundamental concepts.
3. The students are thoroughly trained in learning practical skills by completing all the experiments in chemistry lab.

List of Experiments**Titrimetry:**

1. Estimation of hardness of water by EDTA method.

Instrumental Methods:**Colorimetry:**

2. Determination of Ferrous iron in cement by Colorimetric method
3. Estimation of Copper by Colorimetric method.

Conductometry:

4. Estimation of HCl by Conductometric titrations.
5. Estimation of Acetic acid in a mixture of HCl and Acetic acid by Conductometric titrations.

Potentiometry:

6. Estimation of HCl by Potentiometric titrations.
7. Estimation of Fe^{2+} by Potentiometry using KMnO_4 .

Preparation:

8. Preparation of Aspirin.

Physical properties:

9. Determination of Viscosity of sample oil by Redwood Viscometer.

10. Determination of Surface Tension of a given liquid by Stalagmometer.

Text Book:

1. Inorganic quantitative analysis, Vogel
2. A text book on experiments and calculation in Engineering Chemistry by S.S.Dara

Suggested Readings:

1. Practical Engineering Chemistry by K. Mukkanti, et al, B.S. Publications, Hyderabad.
2. Text Book of Engineering Chemistry by R. N. Goyal and Harrmendra Goel, Ane Books Private Ltd.

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

1. Estimate the total hardness present in a sample of water.
2. Select lubricants for various purposes and determine the surface tension of a given liquid.
3. Prepare synthetic drug molecule.
4. Determine the strength of an acid by conductometric and potentiometric methods.
5. Find the amount of Fe^{+2} and Cu^{2+} present in unknown substances using titrimetric and instrumental methods.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B.TECH- I YEAR – II- SEM-CSE****L T/P/D C**
- -/3/-1.5**(R18A0582)OBJECT ORIENTED PROGRAMMING LAB****Objectives:**

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

Week 1:

Basic C++ Programs

Week2:

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

Week 3:

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

Week 4:

- a) Write a C++ program to sort a list of numbers in ascending order.
- b) Write a Program to illustrate New and Delete Keywords for dynamic memory allocation

Week 5

- a) Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
- b) Program to illustrate default constructor, parameterized constructor and copy constructors

c) 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
ssign()	Assign Initial Values
compute()	to Compute Total, Average
display()	to Display the Data.

Week 6:

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

Week 7:

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

Week 8:

Revision laboratory

Week 9

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

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

Week 10

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

- 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

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

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

Week 14

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. Stroustrup, Pearson Education.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**ECH- I YEAR – II- SEM-CSE****L T/P/D C****- -/3/- 1.5****(R18A0281) BASIC ELECTRICAL ENGINEERING LAB****OBJECTIVES:**

1. To Design Electrical Systems.
2. To Analyze A Given Network By Applying Various Network Theorems.
3. To Expose The Students To The Operation Of DC Generator
4. To Expose The Students To The Operation Of DC Motor and Transformer.
5. To Examine The Self Excitation In DC Generators.

CYCLE –I

1. Verification of KVL and KCL.
2. Verification of Thevenin's theorem.
3. Verification of Norton's theorem.
4. Verification of Superposition theorem.
5. Verification of Maximum power transfer theorem.
6. Verification of Reciprocity theorem.

CYCLE-II

7. Magnetization characteristics of DC shunt generator.
8. Swinburne's test on DC shunt machine.
9. Brake test on DC shunt motor.
10. OC & SC tests on single phase transformer.
11. Load test on single phase transformer.

NOTE: Any 10 of Above Experiments Are To Be Conducted**OUTCOMES:**

After successfully studying this course, students will:

1. Explain the concept of circuit laws and network theorems and apply them to laboratory measurements.
2. Be able to systematically obtain the equations that characterize the performance of an electric circuit as well as solving both single phase and DC Machines
3. Acknowledge the principles of operation and the main features of electric machines and their applications.
4. Acquire skills in using electrical measuring devices.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**B.TECH- I YEAR – II- SEM-CSE****L T/P/D C**
2 -/-/- -**(R18A0003)HUMAN VALUES AND SOCIETAL PERSPECTIVE**
(Mandatory Course)**INTRODUCTION:**

Human values are the virtues that guide us to take into account human element when one interacts with other human beings. It's both what we expect others to do for us and what we aim to give to other human beings. These human values give the effect of bonding, comforting and reassuring.

OBJECTIVES:

This introductory course input is intended:

1. 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.
2. 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 forms the basis of value based living in a natural way.
3. to highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behaviour and mutually enriching interaction with Nature.

UNIT - I:

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education: Understanding the need, basic guidelines, content and process for Value Education.

Self Exploration - what is it? - its content and process; 'Natural Acceptance' and Experiential Validation - as the mechanism for self exploration. Continuous Happiness and Prosperity

A look at basic Human Aspirations- Right understanding, Relationship and Physical Facilities - the basic requirements for fulfillment of aspirations of every human being with their correct priority.

Understanding Happiness and Prosperity correctly - A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

UNIT - II:

Understanding 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 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-astiva as comprehensive Human Goals. Visualizing a universal harmonious order in society - Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyawastha) - from family to worldfamily!

UNIT - IV:

Understanding Harmony in the nature and Existence - Whole existence as Coexistence: 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 Professional Ethics: Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basic for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in professional ethics:

- a. Ability to utilize the professional competence for augmenting universal human order.
- b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems.

- c. Ability to identify and develop appropriate technologies and management patterns for above productionsystems.

TEXT BOOKS:

1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
2. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rdEdition.

REFERENCE BOOKS:

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins,USA
2. E. F. Schumaner, 1973, Small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.
3. A Nagraj, 1998 Jeevan Vidya ekParichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1991.
5. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.
6. A. N. Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth - Club of Rome's report, Universe Books.
9. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.
10. M Govindrajan, S Natrajan & V. S Senthil kumar, Engineering Ethics (including Humna 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. Charle Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology - the Untold Story

OUTCOMES:

1. The students will be able to obtain happiness and prosperity in their life.
2. They will develop harmony at all levels.
3. They can have satisfying human behavior throughout their life.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -I Sem****L T/P/DC****3 -/-/ 3****(R18A0503) DATA STRUCTURES****Prerequisites:** A course on “Programming for Problem Solving”.**Course Objectives:**

- To impart the basic concepts of datastructures
- Exploring basic data structures such as stacks queues and lists.
- Introduces a variety of data structures such as hash tables, search trees, heaps, graphs.
- To understand concepts about searching and sorting techniques

UNIT-I

Introduction: Abstract data types, **Singly linked list:** Definition, operations: Traversing, Searching, Insertion and deletion, **Doubly linked list:** Definition, operations: Traversing, Searching, Insertion and deletion, **Circular Linked List:** Definition, operations: Traversing, Searching, Insertion and deletion.

UNIT-II

Stack: Stack ADT, array and linked list implementation, Applications- expression conversion and evaluation. **Queue:** Types of Queue: Simple Queue, Circular Queue, Queue ADT- array and linked list implementation. Priority Queue, heaps.

UNIT-III

Searching: Linear and binary search methods. **Sorting:** Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort. Time Complexities. **Graphs:** Basic terminology, representation of graphs, graph traversal methods DFS, BFS.

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.

UNIT-V

Binary Search Trees: Various Binary tree representation, definition, BST ADT, Implementation, Operations- Searching, Insertion and Deletion, Binary tree traversals, threaded binary trees,

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, B+ Tree.

TEXTBOOKS:

1. Data Structures using C++, Special Edition-MRCET, Tata McGraw-Hill Publishers 2017.
2. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.Education.

REFERENCE BOOKS:

1. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition

OUTCOMES:

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

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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -I Sem****LT/P/C
3 -/-/3****(R18A0461) ANALOG AND DIGITAL ELECTRONICS****COURSE OBJECTIVES**

The main objectives of the course are:

- To familiarize the student with the principal of operation, analysis and design of junction diode and BJT.
- To understand basic number systems codes and logical gates.
- To introduce the methods for simplifying Boolean expressions
- To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits

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, diode equivalent circuits, Zener diode characteristics.

UNIT-II

BIPOLAR JUNCTION TRANSISTOR: The Junction transistor, Transistor construction, Transistor current components, Transistor as an amplifier, 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.

UNIT-III

Number System and Boolean Algebra: Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal, Unit Distance Code, Digital Logic Gates (AND, NAND, OR, NOR, EX-OR, EX-NOR), Properties of XOR Gates, Universal Gates, Basic Theorems and Properties, Switching Functions, Canonical and Standard Form.

UNIT-IV

Minimization Techniques: The Karnaugh Map Method, Three, Four and Five Variable Maps, Prime and Essential Implications, Don't Care Map Entries, Using the Maps for Simplifying, Multilevel NAND/NOR realizations.

UNIT-V

Combinational Circuits: Design procedure – Half adder, Full Adder, Half subtractor, Full subtractor, Multiplexer/Demultiplexer, decoder, encoder, Code converters, Magnitude Comparator.

Sequential circuits: Latches, Flip-Flops-SR, JK, D, T and master slave, characteristic tables and equations, Conversion from one type of Flip-Flop to another.

TEXT BOOKS:

1. "Electronic Devices & Circuits", Special Edition – MRCET, McGraw Hill Publications, 2017.
2. Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGrawHill.
3. Electronic Devices and Circuits, S.Salivahanan, N.Sureshkumar, McGrawHill.
4. M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 /Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
5. Switching and Finite Automata Theory- ZviKohavi& Niraj K. Jha, 3rd Edition, Cambridge.

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. John F.Wakerly, Digital Design, Fourth Edition, Pearson/PHI, 2006
4. John.M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.
5. Charles H.Roth. Fundamentals of Logic Design, Thomson Learning, 2003.

COURSE OUTCOMES:

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

- Understand and Analyze the PN and Zener diodes, operation and its characteristics
- Understand and analyze the BJT transistor.
- 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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -ISem****L T/P/D C**
3 -/-/ 3**(R18A0504) OPERATING SYSTEMS****OBJECTIVES:**

- To learn the fundamentals of Operating Systems.
- To learn the mechanisms of OS to handle processes and threads and their communication
- To learn the mechanisms involved in memory management in contemporary OS
- To gain knowledge on distributed operating system concepts that includes architecture,
- Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
- To know the components and management aspects of concurrency management

UNIT-I

Introduction: Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating System.

Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching

Thread: Definition, Various states, Benefits of threads, Types of threads, Concept of Multithreads.

UNIT-II

Process Scheduling: Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF, RR; Multiprocessor scheduling: Real Time scheduling: RM and EDF.

Inter-process Communication: Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer/Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dining Philosopher Problem etc.

UNIT-III

Memory Management: Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition–Internal and External fragmentation and Compaction; Paging: Principle of operation – Page allocation – Hardware support for paging, protection and sharing, Disadvantages of paging.

Virtual Memory: Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault, Working Set, Dirty page/Dirty bit – Demand paging, Page

Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU).

UNIT-IV

File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance.

I/O Hardware: I/O devices, Device controllers, Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software.

UNIT-V

Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.

Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk reliability, Disk formatting, Boot-block, Bad blocks.

TEXT BOOKS:

1. Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin,Greg Gagne, Wiley Asia Student Edition.
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings,Prentice Hall ofIndia.

REFERENCE BOOKS:

1. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, IrwinPublishing
2. Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, Addison- Wesley
3. Design of the Unix Operating Systems, 8th Edition by Maurice Bach, Prentice-HallofIndia
4. Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly and Associates

OUTCOMES:

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

- Create processes andthreads.
- Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, ResponseTime.
- For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the accesstime.
- Design and implement file managementsystem.
- For a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/Ocontrollers.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -ISem****L T/P/DC****3 -/-/ 3****(R18A0024) PROBABILITY AND STATISTICS****OBJECTIVES:**

- To understand a random variable that describes randomness or an uncertainty in certain realistic situations which can be either discrete or continuous type.
- To learn functions of multiple random variables through joint distributions since the random situations are described as functions of multiple random variables.
- To learn some of the important probability distributions like Binomial, Poisson Distributions (discrete case) and the Normal Distribution (continuous case).
- To understand linear relationship between two variables and also to predict how a dependent variable changes based on adjustments to an independent variable.
- To make inferences about a population from sample data (large and small samples) using probability theory.

UNIT – I: Random Variables

Single and multiple random variables -discrete and continuous. Probability distribution function, mass function and density function of probability distributions. Mathematical expectation and variance.

UNIT-II: Probability distributions

Binomial distribution – properties, mean and variance, Poisson distribution – properties, mean and variance and normal distribution – properties, mean and variance.

UNIT -III: Correlation and Regression

Correlation -coefficient of correlation, rank correlation. Regression-regression coefficients, lines of regression.

UNIT –IV: Sampling

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. Estimation - point estimation and interval estimation.

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.

Unit-V: Statistical Inferences

Large sample Tests: Test of significance - Large sample test for single mean, difference of means, single proportion, and difference of proportions.

Small samples: Test for single mean, difference of means, test for ratio of variances (F-test)
- Chi-square test for goodness of fit and independence of attributes.

TEXT BOOKS:

1. Fundamental of Statistics by S.C. Gupta, Himalaya PublishingHouse.
2. Fundamentals of Mathematical Statistics by SC Gupta and V.K. Kapoor, Sultan Chand Publishers.
3. Higher Engineering Mathematics by B.S. Grewal, KhannaPublishers.

REFERENCES:

1. Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press.
2. Probability and Statistics by Dr. T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham & M V S S A N Prasad. S Chand Publishers.

COURSE OUTCOMES:

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

- Describe randomness in certain realistic situation which can be either discrete or continuous type.
- Provide very good insight which is essential for industrial applications by learning probability distributions.
- Make data-driven decisions by using correlation and regression.
- Understand the importance of sampling distribution of a given statistic of a random sample.
- Draw statistical inference using samples of a given size which is taken from a population and to apply statistical methods for analyzing experimental data.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -ISem****L T/P/D C****3 -/-/ 3****(R18A0505) COMPUTER ORGANIZATION****Objectives of the course:**

To expose the students to the following:

1. How Computer Systems work & the basic principles
2. Instruction Level Architecture and Instruction Execution
3. The current state of art in memory system design
4. How I/O devices are accessed and its principles.
5. To provide the knowledge on Instruction Level Parallelism
6. To impart the knowledge on microprogramming
7. Concepts of advanced pipelining techniques.

UNIT I

Basic Functional units of Computers: functional units, basic Operational concepts, Bus structures. Software, Performance, Multiprocessors, Multicomputer. **Data Representation:** Signed number representation, fixed and floating point Representations. **Computer Arithmetic:** Addition and subtraction, multiplication Algorithms, Division Algorithms. Error detection and correction codes

UNIT II

Register Transfer Language and Micro Operations: RTL- Registers, Register transfers, Bus and memory transfers. **Micro operations:** Arithmetic, Logic, and Shift micro operations, Arithmetic logic shift unit.

Basic Computer Organization and Design: Computer Registers, Computer instructions, Instruction cycle. Instruction codes, Timing and Control, Types of Instructions: Memory Reference Instructions, Input – Output and Interrupt, Complete Computer Description.

UNIT III

Central Processing Unit organization: General Register Organization, Stack organization, Instruction formats, Addressing modes, Data Transfer and Manipulation, Program Control, CISC and RISC processors

Control unit design: Design approaches, Control memory, Address sequencing, micro program example, design of CU. Micro Programmed Control.

UNIT IV

Memory Organization: Semiconductor memory technologies, hierarchy, Interleaving, **Main Memory**-RAM and ROM chips, Address map, Associative memory-Hardware organization. Match logic. Cache memory-size vs. block size, Mapping functions-Associate, Direct, Set Associative mapping. Replacement algorithms, write policies. **Auxiliary memory**-Magnetic tapes etc

UNIT V

Input –Output Organization: Peripheral devices, Input-output subsystems, I/O device interface, I/O Processor, I/O transfers–Program controlled, Interrupt driven, and DMA, interrupts and exceptions. I/O device interfaces – SCII, USB

Pipelining and Vector Processing: Basic concepts, Instruction level Parallelism Throughput and Speedup, Pipeline hazards. **Case Study**- Introduction to x86 architecture.

Text Books:

1. “Computer Organization and Design: The Hardware/Software Interface”, 5th Edition by David A. Patterson and John L. Hennessy, Elsevier.
2. “Computer Organization and Embedded Systems”, 6th Edition by Carl Hamacher, McGraw Hill Higher Education.

Reference Books:

1. “Computer Architecture and Organization”, 3rd Edition by John P. Hayes, WCB/McGraw-Hill
2. “Computer Organization and Architecture: Designing for Performance”, 10th Edition by William Stallings, Pearson Education.
3. “Computer System Design and Architecture”, 2nd Edition by Vincent P. Heuring and Harry F. Jordan, Pearson Education.

Course 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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -ISem**

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(R18A506) DISCRETE MATHEMATICS**OBJECTIVES:**

The course should enable the students to:

- Describe the logical and mathematical foundations, and study abstract models of computation.
- Illustrate the limitations of predicate logic.
- Define modern algebra for constructing and writing mathematical proofs.
- Solve the practical examples of sets, functions, relations and recurrence relations.
- Recognize the patterns that arise in graph problems and use this knowledge for constructing the trees and spanning trees

UNIT – I: MATHEMATICAL LOGIC AND PREDICATES

Mathematical logic: Statements and notations, connectives, well-formed formulas, truth tables, tautology, equivalence, implication; Normal forms: Disjunctive normal forms, conjunctive normal forms, principle disjunctive normal forms, principle conjunctive normal forms;

Predicate calculus: Predicative logic, statement functions, variables and quantifiers, free and bound variables, rules of inference, consistency, proof of contradiction, automatic theorem proving.

UNIT – II: RELATIONS, FUNCTIONS AND LATTICES

Relations: Properties of binary relations, equivalence, compatibility and partial ordering relations, lattices, Hasse diagram; **Functions:** Inverse function, composition of functions, recursive functions; **Lattices:** Lattices as partially ordered sets; Definition and examples, properties of lattices, sub lattices, some special lattices.

UNIT - III ALGEBRAIC STRUCTURES AND COMBINATORICS

Algebraic structures: Algebraic systems, examples and general properties, semi groups and monoids, groups, sub groups, homomorphism, isomorphism, rings.

Combinatorics: The fundamental counting principles, permutations, disarrangements, combinations, permutations and combinations with repetitions, the binomial theorem, multinomial theorem, generalized inclusion exclusion principle.

UNIT - IV RECURRENCE RELATION

Recurrence relation: Generating functions, function of sequences calculating coefficient of generating function, recurrence relations, solving recurrence relation by substitution and generating functions, Characteristics roots solution of homogeneous recurrence relation.

UNIT - V GRAPHS AND TREES

Graphs: Basic concepts of graphs, isomorphic graphs, Euler graphs, Hamiltonian graphs, planar graphs, graph coloring, digraphs, directed acyclic graphs, weighted digraphs, region graph, chromatic numbers; **Trees:** Trees, spanning trees, minimal spanning trees.

TEXTBOOKS:

1. J. P. Tremblay, R. Manohar, Discrete Mathematical Structures with Applications to Computer Science , Tata McGraw Hill, India, 1st Edition,1997.
2. Joe L. Mott, Abraham Kandel, Theodore P. Baker, — Discrete Mathematics for Computer Scientists and Mathematicians, Prentice Hall of India Learning Private Limited, New Delhi, India, 2nd Edition, 2010.

REFERENCE BOOKS

1. Kenneth H. Rosen, — Discrete Mathematics and Its Applications, Tata McGraw-Hill, New Delhi, India, 6th Edition, 2012.
2. C. L. Liu, D. P. Mohapatra, — Elements of Discrete Mathematics, Tata McGraw-Hill, India, 3rd Edition, 2008.
3. Ralph P. Grimaldi, B. V. Ramana, — Discrete and Combinatorial Mathematics - An Applied Introduction , Pearson Education, India, 5th Edition, 2011.
4. D. S. Malik, M. K. Sen, — Discrete Mathematical Structures: Theory and Applications, Thomson Course Technology, India, 1st Edition, 2004.

OUTCOMES:

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

- For a given logic sentence express it in terms of predicates, quantifiers, and logical connectives
- For a given a problem, derive the solution using deductive logic and prove the solution based on logical inference
- For a given a mathematical problem, classify its algebraic structure
- Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra
- Develop the given problem as graph networks and solve with techniques of graph theory.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -ISem****L T/P/DC****- -/3/- 1.5****(R18A0583) OPERATING SYSTEMS LAB****OBJECTIVES:**

- To understand the functionalities of various layers of OSI model
- To explain the difference between hardware, software; operating systems, programs and files.
- Identify the purpose of different software applications.

Week 1: Simulate the following CPU scheduling algorithms.

a) FCFS b) SJF c) Round Robin d) Priority.

Week 2: Write a C program to simulate producer-consumer problem using Semaphores**Week 3:** Write a C program to simulate the concept of Dining-philosophers problem.**Week 4:** Simulate MVT and MFT.**Week 5:** Simulate all page replacement algorithms

a) FIFO b) LRU c) OPTIMAL

Week 6: Simulate all File Organization Techniques

a) Single level directory b) Two level directory

Week 7: Simulate all file allocation strategies

a) Sequential b) Indexed c) Linked.

Week 8: Simulate Bankers Algorithm for Dead Lock Avoidance.**Week 9:** Simulate Bankers Algorithm for Dead Lock Prevention.**Week 10:** Write a C program to simulate disk scheduling algorithms.

a) FCFS b) SCAN c) C-SCAN

REFERENCE BOOKS:

1. An Introduction to Operating Systems, P.C.P Bhatt, 2nd edition, PHI.
2. Modern Operating Systems, Andrew S Tanenbaum, 3rd Edition, PHI

OUTCOMES:

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

- Ability to implement interprocess communication between two processes.
- Ability to design and solve synchronization problems.
- Ability to simulate and implement operating system concepts such as scheduling, Deadlock management, file management, and memory management.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -ISem****L T/P/DC****- -/3/-1.5****(R18A0584) DATA STRUCTURES LAB****OBJECTIVES:**

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

Week 1.

Write a program that uses functions to perform the following operations on singly linked list i) Creation ii) Insertion iii) Deletion iv) Traversal.

Week 2.

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

Week 3.

Write a program that uses functions to perform the following operations on circular linked List i) Creation ii) Insertion iii) Deletion iv) Traversal.

Week 4.

Write a program that implement stack (its operations) using i) Arrays ii) Linked list (Pointers).

Week 5.

Write a program that implement Queue (its operations) using i) Arrays ii) Linked list (Pointers).

Week 6.

- i) Write a program that implement Circular Queue (its operations) using Arrays.
- ii) Write a program that uses both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
 - a) Linear search b) Binary search.

Week 7.

Write a program that implements the following sorting

- i) Bubble sort ii) Selection sort iii) Quick sort.

Week 8.

Write a program that implements the following

- i) Insertion sort ii) Merge sort iii) Heapsort.

Week 9.

Write a program to implement all the functions of a dictionary (ADT) using Linked List.

Week 10.

- Write a program to perform the following operations:
- a) Insert an element into a binary search tree.
 - b) Delete an element from a binary search tree.
 - c) Search for a key element in a binary search tree.

Week 11.

Write a program to implement the tree traversal methods.

Week 12.

Write a program to perform the following operations:

- a) Insert an element into aAVLtree.
- b) Delete an element from aAVLtree.
- c) Search for a key element in a AVL tree.

TEXT BOOKS:

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

OUTCOMES:

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

- For a given Search problem (Linear Search and Binary Search) student will able to implement it.
- For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
- Student will able to write program for Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -ISem****L T/P/D C**
2 -/-/- 0**(R18A0004) FRENCH LANGUAGE****INTRODUCTION**

In view of the growing importance of foreign languages as a communication tool in some countries of the world, French has been identified as one of the most popular languages after English. As a result, French program is introduced to develop the linguistic and communicative skills of engineering students and to familiarize them to the French communication skills. This course focuses on basic oral skills.

OBJECTIVES

1. To inculcate the basic knowledge of the French language.
2. To hone the basic sentence constructions in day to day expressions for communication in their vocation.
3. To culminate their major with evidence of a purposeful education.

UNIT - I:

Speaking: Introduction to the French language and culture – Salutations - French alphabet - Introducing people

Writing: Understand and fill out a form

Grammar: The verbs “to be” and “to have” in the present tense of the indicative

Vocabulary: The numbers from 1 to 20 - Professions – Nationalities

UNIT - II:

Speaking: Talk about one’s family – description of a person - express his admirations and preferences - express possession - express negation

Writing: Write and understand a short message

Grammar: Nouns (gender and number) - Articles - The –er verbs in the present - Possessive adjectives Qualifying adjectives

Vocabulary: The family – Clothes - Colors - The numbers from 1 to 100 - The classroom

UNIT - III

Speaking: Talk about your daily activities - be in time - ask and indicate the date and time - talk about sports and recreation - express the frequency

Writing: A letter to a friend

Grammar: The expression of time – The –ir verbs in the present - The verbs do, go, take, come, -Adverbs - Reflexive verbs

Vocabulary: The days and months of the year - The sports – Hobbies

UNIT - IV

Speaking: Express the quantity - ask and give the price - express the need, the will and the capacity - compare (adjective) - speak at the restaurant / in the shops

Writing: A dialogue between a vendor and a customer at the market

Grammar: Verbs “to want”, “to can” - Express capacity / possibility - Express will / desire – the future tense

Vocabulary: The food – Meals - Fruits and vegetables – The parts of the body

UNIT - V

Speaking: Express the prohibition and the obligation - describe an apartment - talk about the weather / ask the weather - ask the opinion - give your opinion - express your agreement or disagreement

Writing: Descriptions

Grammar: Demonstrative adjectives -Prepositions - The verb 'must' to indicate obligation and necessity in the present

Vocabulary: Seasons – Holidays - The city – Furniture

NOTE: The students are exposed to simple listening and reading activities.

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 Evelyne Charvier-Berman, Anne C. Cummings.

OUTCOMES

1. The students will be able to communicate in French at A1 level.
2. The student will have an advantage in the competitive job market.
3. This course benefits the graduates when pursuing study *opportunities* in the countries where French is the official language.

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(R18A0507) DESIGN AND ANALYSIS OF ALGORITHMS**Course 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.
- To understand the differences between tractable and intractable problems.
- To introduce P and NP classes.

UNIT - I

Introduction-Algorithm definition, Algorithm Specification, Performance Analysis- Space complexity, Time complexity, Randomized Algorithms.

Divide and conquer- General method, applications - Binary search, Merge sort, Quick sort, Strassen's Matrix Multiplication.

UNIT - II

Disjoint set operations, union and find algorithms, AND/OR graphs, Connected Components and Spanning trees, Bi-connected components

Backtracking-General method, applications- The 8-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT - III

Greedy method- General method, applications- Knapsack problem, Job sequencing with deadlines, Minimum cost spanning trees, Single source shortest path problem.

UNIT - IV

Dynamic Programming- General Method, applications- Chained matrix multiplication, All pairs shortest path problem, Optimal binary search trees, 0/1 knapsack problem, Reliability design, Traveling sales person problem.

UNIT - V

Branch and Bound- General Method, applications-0/1 Knapsack problem, LC Branch and Bound solution, FIFO Branch and Bound solution, Traveling sales person problem.

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

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Sartaj Sahni and S. Rajasekharan, Universities Press.
2. Design and Analysis of Algorithms, P. H. Dave, H.B.Dave, 2nd edition, Pearson Education.

REFERENCE BOOKS

1. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.
2. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ. Press
3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.
4. Foundations of Algorithms,, R. Neapolitan and K. Naimipour, 4th edition, Jones and Bartlett Student edition.
5. Introduction to Algorithms, 3rd Edition, T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, PHI

Course Outcomes:

- Ability to analyze the performance of algorithms.
- Ability to choose appropriate algorithm design techniques for solving problems.
- Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -II Sem****L T/P/DC****3 -/-/ 3****(R18A0508) FORMAL LANGUAGE & AUTOMATATHEORY****OBJECTIVES:**

1. Understand mathematical models finite automata.
2. Explain Regular Expressions and Finite Automata Conversions.
3. Understand Grammars for Regular and Context Free Languages.
4. Learn Context Free Grammar Normal Forms and Push Down Automata.
5. Explain Computational theory and models.

UNIT I

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

Finite Automata: 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 FSM's, Finite Automata with output- Moore and Mealy machines.

UNIT II

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite automata for a given regular expressions, Conversion of finite automata to Regular expressions, Pumping lemma of regular sets, closure properties of regular sets.

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.

UNIT IV

Context Free Grammars: Ambiguity in context free grammars, Minimization of context free grammars, Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages, Enumeration of properties of CFL.

Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty stack and its equivalence, equivalence of CFL and PDA, inter conversion, Introduction to DCFL and DPDA.

UNIT V

Turing Machine: Turing Machine, definition, model, design of TM, computable functions, Turing recognizable (Recursively enumerable) and Turing-decidable (recursive) languages and their closure properties, Church's hypothesis, counter machine, types of Turing machines.

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

Text books

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, Introduction to Automata Theory, Languages, and Computation, Pearson Education Asia.

Reference books:

1. Harry R. Lewis and Christos H. Papadimitriou, Elements of the Theory of Computation, Pearson Education Asia.
2. Dexter C. Kozen, Automata and Computability, Undergraduate Texts in Computer Science, Springer.
3. Michael Sipser, Introduction to the Theory of Computation, PWS Publishing.
4. John Martin, Introduction to Languages and The Theory of Computation, Tata McGraw Hill.

Course Outcomes:

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

1. Design Finite Automata models.
2. Construct Regular Expressions and equivalent automata models.
3. Formulate Grammars for Formal languages.
4. Represent Normal Forms and Push Down Automata.
5. Experiment with Computational models.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -II Sem****L T/P/D C****3 -/-/- 3****(R18A0509) JAVA PROGRAMMING****Objectives:**

- The objective of this course is to provide object oriented concepts through which robust, secured and reusable software can be developed.
- To understand object oriented principles like abstraction, encapsulation, inheritance, polymorphism and apply them in solving problems.
- To understand the principles of inheritance and polymorphism and demonstrate how they relate to the design of abstract classes.
- To understand the implementation of packages and interfaces.
- To understand the concepts of exception handling, multithreading and collection classes.
- To understand how to connect to the database using JDBC.
- To understand the design of Graphical User Interface using applets and swing controls.

UNIT-I

Java Programming- History of Java, comments, Data types, Variables, Constants, Scope and Lifetime of variables, Operators, Type conversion and casting, Enumerated types, Control flow- block scope, conditional statements, loops, break and continue statements, arrays, simple java stand alone programs, class, object, and its methods constructors, methods, static fields and methods, access control, this reference, overloading constructors, recursion, exploring string class, garbage collection

UNIT – II

Inheritance – Inheritance types, super keyword, preventing inheritance: final classes and methods..

Polymorphism – method overloading and method overriding, abstract classes and methods.

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

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

UNIT-III

Exception handling- Benefits of exception handling, the classification of exceptions - exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses.

Multithreading – Differences between multiple processes and multiple threads, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer problem.

UNIT-IV

Collection Framework in Java – Introduction to java collections, Overview of java collection framework, Commonly used collection classes- Array List, Vector, Hash table, Stack, Lambda Expressions.

Files- Streams- Byte streams, Character streams, Text input/output, Binary input/output, 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, Data Access Object (DAO).

UNIT-V

GUI Programming with Swing - The AWT class hierarchy, Introduction to Swing, Swing Vs AWT, Hierarchy for Swing components, 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, Delegation event model, Examples: Handling Mouse and Key events, Adapter classes.

TEXT BOOK:

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
2. Core Java: An Integrated Approach – Dr R Nageswara Rao

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.
5. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides.

Outcomes:

- An understanding of the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;
- A competence to design, write, compile, test and execute straightforward programs using a high level language;
- An appreciation of the principles of object oriented programming;
- An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.

- Demonstrate the ability to use simple data structures like arrays in a Java program.
- Be able to make use of members of classes found in the Java API (such as the Math class).
- Demonstrate the ability to employ various types of selection constructs in a Java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
- Able to develop applications using Applet, AWT, JDBC and Swings

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -II Sem****LT/P/DC****3 -/-/ 3****(R18A0510) DATABASE MANAGEMENT SYSTEMS****OBJECTIVES:**

- To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
- To understand and use data manipulation language to query, update, and manage a database
- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server), Data Warehousing.
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

UNIT I:

Database System Applications, Purpose of Database Systems, View of Data – Data Abstraction – Instances and Schemas – Database Languages – database Access for applications Programs – Database Users and Administrator – Transaction Management – Database Architecture – Storage Manager – the Query Processor.

Data Models: Introduction to the Relational Model – Structure – Database Schema, Keys – Schema Diagrams. Database design – Other Models, ER diagrams – ER Model - Entities, Attributes and Entity sets – Relationships and Relationship sets – ER Design Issues – Concept Design – Conceptual Design with relevant Examples. Relational Query Languages, Relational Operations.

UNIT II:

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

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

UNIT III:

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

UNIT V:

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Check Points - Buffer Management – Failure with loss of nonvolatile storage.

TEXTBOOKS:

1. Database System Concepts, Silberschatz, Korth, McGraw hill, Sixth Edition.(All UNITS except IIIth)
2. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition.

REFERENCE BOOKS:

1. Fundamentals of Database Systems, ElmasriNavathePearsonEducation.
2. An Introduction to Database systems, C.J. Date, A.Kannan, S.SwamiNadhan, Pearson, Eight Edition for UNITIII.

Outcomes:

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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -II Sem****L T/P/DC****3 -/-/ 3****(R18A0061) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS****Course Objectives:**

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

Course Outcomes:

Students should be able,

- To understand the basic economic principles, forecast demand and supply.
- To estimate cost and understand market structure, pricing practices.
- To interpret the financial results of the organisation.

Unit-I

Introduction to Managerial Economics: Definition, Nature and Scope of Managerial Economics, Micro and Macroeconomic Concepts.

Demand Analysis: Demand Determinants, Law of Demand and exceptions.

Elasticity of Demand: Definition, Types, Measurement and Significance of elasticity of Demand.

Demand Forecasting: Factors governing Demand Forecasting, Methods of Demand Forecasting (Survey Methods, Expert Opinion, Test Marketing, Controlled Experience, Judgemental Approach, and Time Series Analysis).

Unit-II

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

Cost Analysis: Cost Concepts. Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems)

Unit-III

Markets: Types of Competition and Markets, Features of Perfect Competition, Monopoly and Monopolistic Competition;

Pricing: Objectives, Methods of Pricing;

Business: Features of different forms of Business Organisation (Sole Trader, Partnership, Joint Stock Company, Cooperative Society, and Public Enterprises).

Unit-IV

Introduction to Capital and Financial Accounting: Need for Capital, Types of Capital, Working Capital Analysis, Methods and Sources of raising Finance.

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

Unit-V

Investment Decision: Capital Budgeting - Features, Objectives, and Methods (Payback Method, Accounting Rate of Return and Net Present Value) - advantages & disadvantages. (Simple Problems)

Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, Capital Structure Ratios and Profitability Ratios. (Simple Problems)

References:

- Managerial Economics & Financial Analysis, Special Edition-MRCET. McGraw Hill Publications, 2017
- D.N. Dwivedi, Managerial Economics, Vikas Publications.
- Justin Paul, Leena, Sebastian, Managerial Economics, Cengage
- P. L. Mehta, Managerial Economics: Analysis, Problems and Cases, Sultan Chand & Sons.
- S. N. Maheswari & S. K. Maheswari, Financial Accounting, Vikas Publications.
- M. Y. Khan and P. K. Jain, Financial Management, McGraw Hill

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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OPEN ELECTIVE - I
(R18A0451) DIGITAL ELECTRONICS

COURSE 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.

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.

COURSE OUTCOMES

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

- 1) Analyze 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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech IISem

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

OPEN ELECTIVE - I
(R18A0551) DATABASE SYSTEMS

OBJECTIVES

1. To understand the basic concepts and the applications of databasesystems
2. To Master the basics of SQL and construct queries usingSQL
3. To understand the relational database designprinciples
4. To become familiar with the basic issues of transaction processing and concurrency control
5. To become familiar with database storage structures and accesstechniques

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 andBCNF-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 respective data

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**IIYear B. Tech CSE -II Sem**

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

**OPEN ELECTIVE I
(R18A0553) DATA STRUCTURES USING PYTHON****OBJECTIVES:**

- To read and write simple Python programs.
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures — lists, tuples, dictionaries.
- To do input/output with files in Python.

Unit I

Introduction to Python, Installation and Working with Python, Understanding Python variables Python basic Operators, Understanding python blocks, Python Data Types: Declaring and using Numeric data types: int, float, complex, Using string data type and string operations.

UNIT II

Control Flow- if, if-elif-else, loops, For loop using ranges, string, Use of while loops in python, Loop manipulation using pass, continue, break and else, Programming using Python conditional and loops block, Python arrays.

UNIT III

Functions -Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions (Function Returning Values), Scope of the Variables in a Function - Global and Local Variables. Powerful Lambda function in python.

UNIT IV

Data Structures-List Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences. Comprehensions, Dictionary manipulation, list and dictionary in built functions

UNIT V

Sorting: Bubble Sort, Selection Sort, Insertion Sort, Merge Sort, Quick Sort. Linked Lists, Stacks, Queues

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

- Read, write, execute by hand simple Python programs.
- Structure simple Python programs for solving problems.
- Decompose a Python program into functions.
- Represent compound data using Python lists, tuples, dictionaries.
- Read and write data from/to files in Python Programs

TEXT BOOKS

1. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist``, 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016.
2. R. Nageswara Rao, "Core Python Programming", dreamtech
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson

REFERENCE BOOKS:

1. Core Python Programming, W.Chun, Pearson.
2. Introduction to Python, Kenneth A. Lambert, Cengage
3. Learning Python, Mark Lutz, Orielly

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II Year B.Tech IISem

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3	-/-/-	3

OPEN ELECTIVE - I
(R18A0351) INTELLECTUAL PROPERTY RIGHTS

Course Objectives:

1. To create an understanding on Intellectual Properties and the importance of it.
2. To acquire knowledge on Trademarks, Trade secrets & unfair completion methods.
3. To create awareness on the protection of copyrights and patents.
4. To attain basic understanding of Cyber laws, Cyber Crime and get an understanding of Privacy of Data.
5. To gain knowledge on international aspects and the Emerging Trends in IPR.

UNIT - I:

Introduction: Introduction to Intellectual property, types of intellectual property, importance of intellectual property rights, agencies Responsible for Intellectual property Registration, Regulatory – Compliance and Liability Issues.

UNIT - II:

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, Transfer of Rights, protectable matter, selecting and evaluating trade mark, Registrations of Trade Marks, Claims.

Trade Secrets: Determination of trade secret status, liability for misappropriations of trade secrets, protection for submission.

Unfair competition- Misappropriation right of publicity, false advertising

UNIT - III:

Copy rights: Fundamental of copy right, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, notice of copyright.

Patents: introduction, patent searching process, ownership rights and transfer.

UNIT - IV:

Cyber Law – Information Technology Act – Cyber Crime and E-commerce – Data Security – Confidentiality – Privacy – International aspects of Computer and Online Crime.

UNIT - V:

New development of Intellectual Property: Emerging trends in trade mark; copy rights, patent, International overview on intellectual property.

TEXT BOOKS & REFERENCES:

1. Intellectual property right, Deborah, E. Bouchoux, cengagelearning.
2. Cyber Law. Text & Cases, South-Western's Special Topicscollections.
3. R. Radha Krishnan, S. Balasubramanian: "Intellectual Property Rights", Excel Books. New Delhi
4. A short course in International Intellectual Property Rights – Karla C. Shippey, World Trade Press – 2nd Edition.

5. Intellectual Property Rights – Heritage, Science, & Society under international treaties – A. Subbian, - Deep & Deep Publications – New Delhi.
6. Intellectual Property Rights: N K Acharya: ISBN: 9381849309
7. Intellectual Property Rights: C B Raju: ISBN-8183870341

Course Outcomes:

Student will be able to:

1. Prepare and protect the Inventions, startup ideas and rights of patents and copy rights etc.,
2. Gain knowledge on Trademarks and Trade Secrets.
3. Brings awareness on the various types of Unfair Competition and gets well versed with exposure to licensing and transfer of Copyrights and Patents
4. Attain awareness of Cyber laws and Cyber Crime, to protect the data from Cybercrime.
5. Comprehend emerging trends in IPR globally.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech II Sem

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

**OPEN ELECTIVE - I
(R18A0352) GREEN ENERGY SYSTEMS****COURSE 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 NanjundaRa.
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

COURSE 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.

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3	-/-/-	3

OPEN ELECTIVE I
(R18A0555) DATA VISUALIZATION

Course Objectives:

- To learn different statistical methods for Data visualization.
- To understand the basics of R and Python.
- To learn usage of Watson studio.
- To understand the usage of the packages like Numpy, pandas and matplotlib.
- To know the functionalities and usages of Seaborn.

UNIT I

Introduction to Statistics : Introduction to Statistics, Difference between inferential statistics and descriptivestatistics, Inferential Statistics- Drawing Inferences fromData, RandomVariables, Normal ProbabilityDistribution, Sampling, Sample Statistics and SamplingDistributions.

R overview and Installation- Overview and About R, R and R studio Installation, Descriptive Data analysis using R, Description of basic functions used to describe data in R.

UNIT II

Data manipulation withR: Data manipulation packages-dplyr,data.table, reshape2, tidyr, Lubridate, Data visualization withR.

Data visualization in Watson Studio: Adding data to datarefinery, Visualization of Data on WatsonStudio.

UNIT III

Python: Introduction toPython, How toInstall, Introduction to JupyterNotebook, Python scriptingbasics, NumpyandPandas-Creating and Accessing Numpy Arrays, Introduction to pandas, read and write csv, Descriptive statistics using pandas, Working with text data and datetime columns, Indexing and selecting data, groupby, Merge / Join datasets

UNIT IV

Data Visualization Tools inPython- Introduction to Matplotlib, Basic plots usingmatplotlib, Specialized Visualization Tools usingMatplotlib, Advanced Visualization Tools usingMatplotlib- WaffleCharts, WordClouds.

UNIT V

Introduction to Seaborn: Seaborn functionalities and usage, Spatial Visualizations and Analysis in Python with Folium, Case Study.

TEXT BOOKS:

1. Core Python Programming - Second Edition,R. Nageswara Rao, Dreamtech Press.
2. Hands on programming with R by Garrett Golemund,Shroff/O'Reilly; First edition
3. Fundamentals of Mathematical Statistics by S.C. Gupta, Sultan Chand & Sons

REFERENCE BOOKS:

1. Learn R for Applied Statistics: With Data Visualizations, Regressions, and Statistics by Eric Goh Ming Hui, Apress
2. Python for Data Analysis by William McKinney, Second Edition, O'Reilly Media Inc. \
3. The Comprehensive R Archive Network- <https://cran.r-project.org>
4. <https://seaborn.pydata.org/>
5. <https://dataplatform.cloud.ibm.com/>

Course Outcomes:

At Completion of this course, students would be able to -

- Apply statistical methods for Data visualization.
- Gain knowledge on R and Python
- Understand usage of various packages in R and Python.
- Demonstrate knowledge of Watson studio.
- Apply data visualization tools on various data sets.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -II Sem****L T/P/DC****- -/3/-1.5****(R18A0585) JAVA PROGRAMMING LAB****OBJECTIVES:**

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

- | | |
|-------|---|
| Week1 | Write a java program to find the Fibonacci series using recursive and non recursive functions |
| Week2 | Write a java program to multiply two given matrices. |
| Week3 | Write a java program for Method overloading and Constructor overloading |
| Week4 | write a java program that prompts the user for an integer and then printouts all prime numbers up to that integer |
| Week5 | Write a java program to display the employee details using Scanner class |
| Week6 | Write a java program that checks whether a given string is palindrome or not |
| Week7 | A)Write a java program to represent Abstract class with example.
B)Write a java program to implement Interface using extends keyword |
| Week8 | A)Write a java program to create user defined package |

- B)Write a java program to create inner classes
- Week9 A)Write a java program for creating multiple catch blocks
B)Write a java program for producer and consumer problem using Threads
- Week10 Write a Java program that implements a multi-thread application that has three threads
- Week11 A)Write a java program to display File class properties
B)Write a java program to represent ArrayList class
- C)Write a Java program loads phone no, name from a text file using hash table
- Week12 Write an applet program that displays a simple message
- Week13 A)Write a Java program compute factorial value using Applet
B)Write a program for passing parameters using Applet
- Week14 Write a java program for handling Mouse events and Key events
- Week15 Write a java program that connects to a database using JDBC
- Week16 A)Write a java program to connect to a database using JDBC and insert values into it
B)Write a java program to connect to a database using JDBC and delete values from it
- Week17 Write a java program that works as a simple calculator. Use a Grid Layout to arrange Buttons for digits and for the + - * % operations. Add a text field to display the result

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

OUTCOMES:

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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -II Sem****L T/P/D C****- -/3/-1.5****(R18A0586) DATABASE MANAGEMENT SYSTEMS LAB****Objectives**

Students will have the ability to:

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

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

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

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

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

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

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

Cancellations are also directly handed at the booking office.

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

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

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.

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Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it using software design tool. 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. BUS
2. Ticket
3. Passenger

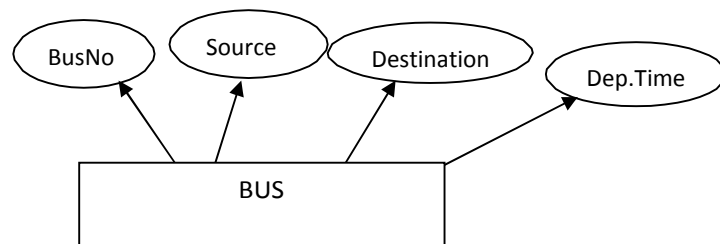
Relationships:

1. Reservation
2. Cancellation

PRIMARY KEY ATTRIBUTES:

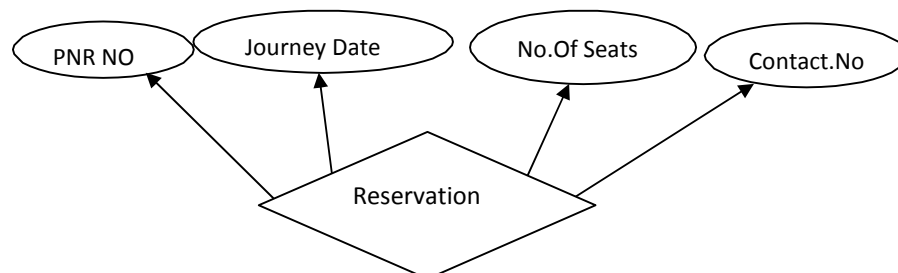
1. Ticket ID (Ticket Entity)
2. Passport ID (PassengerEntity)
3. Bus_NO(BusEntity)

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: 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 3: Practicing DML commands

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

- SELECT - retrieve data from the aatabase
- INSERT - insert data into atable
- UPDATE - updates existing data within atable
- DELETE-deletesallrecordsfromatable,the

space for The recordsremain

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 4: Querying

In this week you are going to practice queries (along with subqueries) using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION, INTERSECT, Constraint 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 5: Aggregate Functions and Number Functions, Nested Query and Co-related Queries

You are going to practice queries using Aggregate functions and number 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.

Nested Query and Co-related Queries

Use the tables sailors, reserves, boats for implementing the following
Sailors(sid: integer, sname: string, rating: integer, age: real);
Boats(bid: integer, bname: string, color: string);

Reserves(sid: integer, bid: integer, day: date).

a. Find the names of sailors who have reserved boat 103

b. Find the name and the age of the youngest sailor

c. Find the names and ratings of sailor whose rating is better than some sailor called

Horatio

- d. Find the names of sailors who have reserved allboats

Experiment 6: VIEWS and JOIN

In this week, we are going to implement views and also perform various operations like alter, update and delete commands.

View:

Write a query to execute and verify the SQL commands using Views (Use Employee Table)

- (a) Alter (b) Update (c) Delete

Join:

Write a query to execute and verify the SQL commands using Join (Use Customer Table)

- (a) Inner join, (b).Left join, (c).Right join (d).Fulljoin

Experiment 7: 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 8: 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 9: 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)
BEGIN 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:VarcharP

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

Experiment 10: 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>PassportID</u>

Passport_id	Ticket_id

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

Experiment 11: PL/SQL Programs

In this week, you are going to learn and work on PL/SQL procedures.

- Write a PL/SQL procedure to find the average of marks?
- Write a PL/SQL procedure to find the factorial of a number?
- Write a PL/SQL code to calculate tax for an employee of an organization – XYZ and to display his/her name & tax, by creating a table under employee database as below.

Employee_salary	Emp_no	Basic	HRA	DA
Total_deduction	Net_salary	Gross_salary		

Experiment 12: Revoke/Grant/Commit/Rollback

In this week, you need to do the following: Declare a table that defines a result set using revoke, grant, savepoint, commit, rollback operations

Consider the following tables namely “DEPARTMENTS” and “EMPLOYEES”

Their schemas are as follows, Departments (dept_no , dept_name , dept_location); Employees (emp_id , emp_name , emp_salary);

- Develop a query to grant all privileges of employee table into departments table
- Develop a query to grant some privileges of employee table into department table
- Develop a query to revoke all privileges of employee table from departments table
- Develop a query to revoke some privileges of employee table from department table
- Write a query to implement the savepoint
- Write a query to implement the commit
- Write a query to implement the rollback

Reference Books:

- Introduction to SQL, Rick F. VanderLans, Pearson education..
- Oracle PL/SQL, B. Rosenzweig and E. Silvestrova, Pearson education.
- Oracle PL/SQL Programming, Steven Feuerstein, SPD.
- SQL & PL/SQL for Oracle 10g, Black Book, Dr. P.S. Deshpande, Dream Tech.
- Oracle Database 11g PL/SQL Programming, M. McLaughlin, TMH.
- SQL Fundamentals, J.J. Patrick, Pearson Education

Outcomes:

Students will be able to demonstrate their skills

- In drawing the ER, EER, and UMLDiagrams.
- In analyzing the business requirements and producing a viable model forthe implementation of thedatabase.
- In converting the entity-relationship diagrams into relationaltables.
- TodevelopappropriateDatabasesetoagivenproblemthatintegratesethical, social, legal, and economicconcerns.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**II Year B. Tech CSE -IISem****LT/P/D C****- -/2/- 0****(R18A0014) ENVIRONMENTAL SCIENCE (Mandatory Courses)****OBJECTIVE:**

We as human being are not an entity separate from the environment around us rather we are a constituent seamlessly integrated and co-exist with the environment around us. We are not an entity so separate from the environment that we can think of mastering and controlling it rather we must understand that each and every action of ours reflects on the environment and vice versa. Ancient wisdom drawn from Vedas about environment and its sustenance reflects this ethos. There is a direct application of this wisdom even in modern times. Idea of an activity-based course on environment protection is to sensitize the students on the above issues through following two type of activities.

UNIT I**Environmental Education and Ecosystems**

Environmental education: Definition and objective. Origin of Environmental sciences from Vedas, Structure and function of an ecosystem, Food chain and Food Web, Ecological Pyramids, Bioaccumulation and Biomagnification.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on importance of Environmental Education

UNIT II**Natural Resources**

Introduction: definition, Forest resources- Uses, Causes and consequences of deforestation, Water resources-Sources and Uses of Water, Benefits and problems of DAMs, Energy resources-Renewable and Non-renewable energy resources.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on Natural Resources

UNIT III**Environmental Pollution**

Environmental segments – structure and composition of atmosphere. Pollution – Sources, effects and control of Air, water. Climate change-ozone layer depletion, Global warming/greenhouse effect.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on Environmental pollution.

UNIT IV**Waste Management**

Solid waste management: sources, effects and control of municipal waste, bio medical waste - waste management and E-waste.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on Cleanliness, segregation of waste and Swacha-Bharath

UNIT V**Social Issues and the Environment**

Concept, threats and strategies of sustainable development, Water conservation-rain water harvesting, Energy conservation, Green activities.

*Activity: Poster making/Seminar/ Slogans making/ Group discussion on Social Issues and the Environment.

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 PHI Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley India Edition.
4. Principles of Environmental Science by William P. Cunningham & Mary Ann Cunningham Tata McGraw –Hill Publishing Company Ltd.
5. Environmental Studies by S. Rama Lakshmi & Purnima Smarath Kalyani Publishers.

OUTCOMES:

Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of Ecological principles and environmental regulations which in turn helps in sustainable development. Understand the complex relationships between natural and human systems.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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III Year B.Tech CSE -I Sem

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(R18A0511) SOFTWARE ENGINEERING

Objectives:

The students will be able :

1. To comprehend the various software process models.
2. To understand the types of software requirements and SRS document.
3. To know the different software design and architectural styles.
4. To learn the software testing approaches and metrics used in software development.
5. To know about quality control and risk management.

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, Process patterns, process assessment.

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agility and Agile Process model, Extreme Programming, Other process models of Agile Development and Tools

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. UML Diagrams.

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 Projects: Software Measurement, Metrics for software quality.

UNIT - V:

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

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, The Capability Maturity Model Integration (CMMI), Software reliability, The ISO 9000 quality standards.

TEXT BOOKS :

1. Software Engineering A practitioner's Approach, Roger S Pressman, 6th edition. McGraw Hill 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 Jawadkar, Tata McGraw-Hill, 2008
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
4. Software Engineering1: Abstraction and modelling, Diner Bjorner, Springer International edition, 2006.
5. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.
6. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.

Course Outcomes:

Students will have the ability:

1. To compare and select a process model for a business system.
2. To identify and specify the requirements for the development of an application.
3. To develop and maintain efficient, reliable and cost effective software solutions.
4. To critically think and evaluate assumptions and arguments of the client.

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(R18A0512) Compiler Design

Objectives:

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

UNIT – I:

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

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

UNIT – II:

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

UNIT – III:

Semantic analysis: Attributed grammars, Syntax directed definition and Translation schemes, Type checker: functions, type expressions, type systems, types checking of various constructs.

Intermediate Code Generation: Functions, different intermediate code forms- syntax tree, DAG, Polish notation, and Three address codes. Translation of different source language constructs into intermediate code.

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

UNIT –IV:

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

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

UNIT – V:

Control flow and Data flow analysis: Flow graphs, Data flow equations, global optimization: Redundant sub expression elimination, Induction variable eliminations, Live Variable analysis.

Object code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

TEXT BOOKS:

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

REFERENCES:

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

Outcomes:

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

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

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(R18A0464)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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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(R18A1205)ARTIFICIAL INTELLIGENCE

COURSE OBJECTIVES:

To train the students to :

1. Understand different types of AI agents, various AI search algorithms
2. Learn the fundamentals of knowledge representation.
3. Be aware of knowledge-based systems and to apply knowledge representation, reasoning.
4. Study Markov Models enable the student to step into applied AI.
5. Gain Knowledge about the various learning techniques and understand Expert Systems.

UNIT – I

Introduction: AI problems, Agents and Environments, Structure of Agents, Problem Solving Agents

Basic Search Strategies: Problem Spaces, Uninformed Search (Breadth First, Depth-First Search, Depth-first with Iterative Deepening), Heuristic Search (Hill Climbing, Generic Best-First, A*), Constraint Satisfaction (Backtracking, Local Search)

UNIT - II

Advanced Search: Constructing Search Trees, Stochastic Search, AO* Search Implementation, Minimax Search, Alpha-Beta Pruning.

Basic Knowledge Representation and Reasoning: Propositional Logic, First-Order Logic, Forward Chaining and Backward Chaining, Introduction to Probabilistic Reasoning, Bayes Theorem

UNIT - III

Advanced Knowledge Representation and Reasoning: Knowledge Representation Issues, Non-monotonic Reasoning, Other Knowledge Representation Schemes.

Reasoning Under Uncertainty: Basic probability, Acting Under Uncertainty, Bayes' Rule, Representing Knowledge in an Uncertain Domain, Bayesian Networks

UNIT - IV

Learning: What Is Learning? Rote Learning, Learning by Taking Advice, Learning in Problem Solving, Learning from Examples - Winston's Learning Program, Decision Trees.

UNIT - V

Expert Systems: Representing and Using Domain Knowledge, Shell, Explanation, Knowledge Acquisition.

TEXT BOOK:

1. Russell, S. and Norvig, P, Artificial Intelligence: A Modern Approach, Third Edition, Prentice-Hall, 2010

REFERENCE BOOKS:

1. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivasankar B. Nair, The McGrawHill publications, Third Edition, 2009.
2. George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education, 6th ed., 2009.

COURSE OUTCOMES:

1. To analyse and compare the various search techniques.
2. To design Knowledge based systems for a given problem and apply reasoning technique.
3. To apply Bayes Rule for a specific problem.
4. To evaluate the various learning techniques and select a suitable one for a situation.
5. To propose ideas for building expert systems.

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(R18A0513)PYTHON PROGRAMMING

COURSE OBJECTIVES:

1. To learn Programming Concepts of Python.
2. To understand Python programs with conditionals and loops.
3. To define Python functions and call them.
4. To have knowledge of Python data structures -- lists, tuples, dictionaries.
5. To know about input/output with files in Python.

UNIT I

INTRODUCTION TO DATA, EXPRESSIONS, STATEMENTS

Introduction to Python and installation, variables, expressions, statements, Numeric datatypes: Int, float, Boolean, string. Basic data types: list--- list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters. Tuple --- tuple assignment, tuple as return value, tuple methods. Sets: operations and methods. Dictionaries: operations and methods.

UNIT II

CONTROL FLOW, LOOPS

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: statements break, continue.

Functions---Function and its use, pass keyword, flow of execution, parameters and arguments.

UNIT III

ADVANCED FUNCTIONS, ARRAYS

Fruitful functions: return values, parameters, local and global scope, function composition, recursion

Advanced Functions: lambda, map, filter, reduce, basic data type comprehensions.

Python arrays: Create an array, Access the Elements of an Array, array methods.

UNIT IV

FILES, EXCEPTIONS

File I/O, Exception Handling, introduction to basic standard libraries, Installation of pip,

Demonstrate Modules: Turtle, pandas, numpy, pdb. Explore packages.

UNIT V

OOPS, FRAMEWORK

Oops concepts: Object, Class, Method, Inheritance, Polymorphism, Data abstraction, Encapsulation,

Python Frameworks: Explore Django framework with an example

TEXT BOOKS:

- 1.Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist``, 2nd edition,Updated for Python 3, Shroff/O'Reilly Publishers, 2016.
- 2.R. Nageswara Rao, "Core Python Programming", dreamtech
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson

REFERENCE BOOKS:

1. Core Python Programming, W.Chun, Pearson.
2. Introduction to Python, Kenneth A. Lambert, Cengage
3. Learning Python, Mark Lutz, Orielly

COURSE OUTCOMES:

Upon completion of the course, students will be able to

- Read, write, execute simple Python programs.
- Structure simple Python programs for solving problems.
- Decompose a Python program into functions.
- Represent compound data using Python lists, tuples, dictionaries.
- Read and write data from/to files in Python Programs

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**Professional Elective-1
(R18A0515) Pervasive Computing**

COURSE OBJECTIVES: The objective of this course is To study the pervasive computing and its applications To study the pervasive computing web based applications To study voice enabling pervasive computing To study PDA in pervasive computing To study user interface issues in pervasive computing

UNIT I:

Pervasive Computing Applications: - Pervasive Computing devices and Interfaces - Device technology trends, - Connecting issues and protocols

UNIT II:

Pervasive Computing and web based Applications: - XML and its role in Pervasive Computing - Wireless Application Protocol (WAP) Architecture and Security - Wireless Mark-Up language (WML)

UNIT III:

Voice Enabling Pervasive Computing: - Voice Standards - Speech Applications in Pervasive Computing and security

UNIT IV:

PDA in Pervasive Computing: – Introduction - PDA software Components, Standards, emerging trends - PDA Device characteristics - PDA Based Access Architecture

UNIT V:

User Interface Issues in Pervasive Computing, Architecture: - Smart Card- based Authentication Mechanisms - Wearable computing Architecture

TEXT BOOKS:

1. Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaec& Klaus Rindtorff. --- Pervasive Computing Technology and Architecture of Mobile Internet Applications, Addison Wesley, Reading, 2002.
2. Uwe Ha nsman, LothatMerk, Martin S Nicklous& Thomas Stober: Principles of Mobile Computing, Second Edition, Springer- Verlag, New Delhi,2003.

REFERENCE BOOKS:

1. Rahul Banerjee: Internetworking Technologies: An Engineering Perspective, Prentice – Hall of India, New Delhi, 2003. (ISBN81-203-2185-5)
2. Rahul Banerjee: Lecture Notes in Pervasive Computing, Outline Notes, BITS-Pilani, 2003.

COURSE OUTCOMES:

On successful completion of the course, the student will:

- Be able to learn pervasive computing devices and interfaces.
- Be able to learn XML role in pervasive computing.
- To get clear idea about WAP architecture and security.
- Be able to learn speech application in pervasive computing.
- Become familiar with different voice standards. Identify user interface issues in pervasive computing.

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Professional Elective-1 (R18A0516) Information Security

Objectives:

- Explain the objectives of information security
- Explain the importance and application of each of confidentiality, integrity, authentication and availability
- Understand various cryptographic algorithms.
- Understand the basic categories of threats to computers and networks
- Describe public-key cryptosystem.
- Describe the enhancements made to IPv4 by IPSec
- Understand Intrusions and intrusion detection
- Discuss the fundamental ideas of public-key cryptography.
- Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
- Discuss Web security and Firewalls

UNIT — I

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

UNIT — II

Symmetric key Ciphers: Block Cipher principles & Algorithms (DES, AES), Block cipher modes of operation, Stream ciphers, RC4, Location and placement of encryption function, Key distribution **Asymmetric key Ciphers:** Principles of public key cryptosystems, Algorithms (RSA, Diffie-Hellman), Key Distribution.

UNIT — III

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, Digital signatures, **Authentication Applications:** Kerberos, X.509 Authentication Service, Public — Key Infrastructure, Biometric Authentication

UNIT — IV

E-Mail Security: Pretty Good Privacy, S/MIME **IP Security:** IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, Combining security associations, key management

UNIT — V

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction **Intruders, Virus and Firewalls:** Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls **Case Studies on Cryptography and security:** Secure **Inter-branch** Payment Transactions, Cross site Scripting Vulnerability, Virtual Elections

TEXT BOOKS:

1. Cryptography and Network Security :William Stallings, Pearson Education, 4th Edition
2. Cryptography and Network Security: Atul Kahate, McGraw Hill, 2nd Edition

REFERENCE BOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security: Forouzan Mukhopadhyay, McGraw Hill, 2nd Edition
3. Information Security, Principles and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: W.M. Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

Outcomes:

- Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
- Ability to identify information system requirements for both of them such as client and server.
- Ability to understand the current legal issues towards information security.

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OPEN ELECTIVE III

(R18A1253)MANAGEMENT INFORMATION SYSTEMS

COURSE OBJECTIVES:

- 1) To understand the competitive advantage of using information systems in the organization for the needful assistance in decision making and management.
- 2) To learn how to plan for information systems & implementation
- 3) 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 BOOKS

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

REFERENCES:

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. Magento 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 OUTCOMES:

- 1) Ability to apply Concepts & applications of Management Information Systems.
- 2) Ability to perform Information Systems Planning & Implementations.
- 3) Ability to adapt Cyber crime and information security procedures.

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OPEN ELECTIVE II
(R18A0552) 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, BufferedReader class, Scanner class, StringTokenizer 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:

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.

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

(R18A01252) 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

(R18A0353) 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), Data Warehousing, Data Mining, Reasons for the growth of ERP market.

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, Financial Management, Quality Management, Materials Management, Supply chain Management (SCM), 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 Plan
- 2)To understand basic concepts of erp systems for manufacturing or service companies.

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OPEN ELECTIVE II

(R15A0354) NANO TECHNOLOGY

COURSE OBJECTIVES:

- 1) To learn about basis of NanoMaterials.
- 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 (FIM), 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, UniversityPress-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 Press2004.

REFERENCES BOOKS:

- 1) Nano: The Essentials by T. Pradeep, McGraw- HillEducation.
- 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 press2000
- 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 Universitypress.
- 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 NanoTechnology.
- 2) Will demonstrate the preparation of NanoTechnology.
- 3) Will develop knowledge in characteristic Nano Technology &NanoMaterials.

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(R1A0587) Compiler Design Lab

Objectives:

- To provide an Understanding of the language translation peculiarities by designing complete translator for an abstract mini language whose syntax by BNF notation in following lines.

SOURCE (MINI) LANGUAGE (A Case Study)

Consider the following mini language, a simple procedural High Level Language, operating on integer data with a syntax looking vaguely like a simple C crossed with Pascal. The syntax of the language is defined by the following BNF grammar:

```

<program> ::= <block>
<block> ::= { <variable definition> <slist> }
           | { <slist> }
<variable definition> ::= int <vardeflist> ;
<vardeflist> ::= <vardec> | <vardec>, <vardeflist>
<vardec> ::= <identifier> | <identifier> [<constant>]
<slist> ::= <statement> | <statement> ; <slist>
<statement> ::= <assignment> | <ifstatement> | <whilestatement> | <block>
              | <printstatement> | <empty>
<assignment> ::= <identifier> = <expression>
              | <identifier> [<expression>] = [<expression>]
<ifstatement> ::= if <bexpression> then <slist> else <slist> endif
              | if <bexpression> then <slist> endif
<whilestatement> ::= while <bexpression> do <slist> enddo
<printstatement> ::= print{ <expression> }
<expression> ::= <expression> <addingop> <term> | <term> | <addingop> <term>
<bexpression> ::= <expression> <relop> <expression>
<relop> ::= < | <= | = | >= | > | !=
<addingop> ::= + | -
<term> ::= <term> <multop> <factor> | <factor>
<multop> ::= * | /
<factor> ::= <constant> | <identifier> | <identifier> [<expression>]
           | (<expression>)
<constant> ::= <digit> | <digit> <constant>
<identifier> ::= <identifier> <letterordigit> | <letter>
<letterordigit> ::= a | b | c | ... | y | z
<digit> ::= 0 | 1 | 2 | 3 | ... | 8 | 9
<empty> ::= has the obvious meaning

```

Comments : zero or more characters enclosed between the standard C/Java style comment brackets /*...*/. The language has the rudimentary support for 1-Dimensional arrays. Ex: int a[3] declares a as an array of 3 elements, referenced as a[0],a[1],a[2].

Sample Program written in this language is :

```
{
  int a[3],t1,t2;
  t1=2;
  a[0]=1; a[1]=2; a[t1]=3;
  t2= -(a[2]+t1*6) / a[2]-t1);
  if t2>5 then
  print(t2);
  else
  {
    int t3;
    t3=99;
    t2=25;
    print(-11+t2*t3); /* this is not a comment on two lines */
  }
  endif
}
```

1. Write a C Program to scan and count the number of characters, words, and line of a file.
2. Write a program for implementation of NFAs that recognize identifiers, constants, and operators of the minilanguage.
3. Write a program for the implementation of DFAs that recognize identifiers, constants, and operators of the minilanguage.
4. Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
5. Implement the lexical analyzer using JLex, flex, flex or lex or other lexical analyzer generating tools.
6. Design Predictive parser for the given language.
7. Design LALR bottom up parser for the above language.
8. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree or Three Address code.
9. Write program to generate machine code from the abstract syntax tree generated by the parser. The following instruction set may be considered as target code.

The following is a simple register-based machine, supporting a total of 17 instructions. It has three distinct internal storage areas. The first is the set of 8 registers, used by the individual instructions as detailed below, the second is an area used for the storage of variables and the third is an area used for the storage of program. The instructions can be preceded by a label. This consists of an integer in the range 1 to 9999 and the label is followed by a colon to separate it from the rest of the instruction. The numerical label can be used as the argument to a jump instruction, as detailed below.

In the description of the individual instructions below, instruction argument types are specified as follows:

R specifies a register in the form R0, R1, R2, R3, R4, R5, R6 or R7 (or r0, r1, etc).

L specifies a numerical label (in the range 1 to 9999).

V specifies a "variable location" (a variable number, or a variable location pointed to by a register - see below).

A specifies a constant value, a variable location, a register or a variable location pointed to by a register (an indirect address). Constant values are specified as an integer value, optionally preceded by a minus sign, preceded by a # symbol. An indirect address is specified by an @ followed by a register.

So, for example an A-type argument could have the form 4 (variable number 4), #4 (the constant value 4), r4 (register 4) or @r4 (the contents of register 4 identifies the variable location to be accessed).

The instruction set is defined as follows:

LOAD A, R : Loads the integer value specified by A into register R.

STORE R, V : Stores the value in register R to variable V.

OUT R : Outputs the value in register R.

NEG R : Negates the value in register R.

ADD A, R : Adds the value specified by A to register R, leaving the result in register R.

SUB A, R : Subtracts the value specified by A from register R, leaving the result in register R.

MUL A, R : Multiplies the value specified by A by register R, leaving the result in register R.

DIV A, R : Divides register R by the value specified by A, leaving the result in register R.

JMP L : Causes an unconditional jump to the instruction with the label L.

JEQ R, L : Jumps to the instruction with the label L if the value in register R is zero.

JNER, L : Jumps to the instruction with the label L if the value in register R is not zero.

JGE R, L : Jumps to the instruction with the label L if the value in register R is greater than or equal to zero.

JGT R, L : Jumps to the instruction with the label L if the value in register R is greater than zero.

JLE R, L : Jumps to the instruction with the label L if the value in register R is less than or equal to zero.

JLT R, L : Jumps to the instruction with the label L if the value in register R is less than zero.

NOP : Is an instruction with no effect. It can be tagged by a label.

STOP : Stops execution of the machine. All programs should terminate by executing a STOP instruction.

RECOMMENDED SYSTEM / SOFTWARE REQUIREMENTS:

1. Intel based desktop PC with minimum of 166MHz or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. C++ Compiler and JDK kit, Lex or Flex and YACC tools (Unix/Linux utilities)

USEFUL TEXT BOOKS / REFERENCES / WEBSITES :

1. Modern compiler implementation in C, Andrew w.Appel, Revised Edn, Cambridge University Press
2. Principles of Compiler Design. – A.V Aho, J.D Ullman ;Pearson Education.
3. **lex&yacc**, -John R Levine, Tony Mason, Doug Brown;O'reilly.

4. **Compiler Construction**, -LOUDEN, Thomson.
5. Engineering a compiler – Cooper & Linda, Elsevier
6. Modern Compiler Design – Dick Grune, Henry E. Bal, Criel TH Jacobs, Wiley Dreatech

Outcomes:

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

- Understand the practical approach of how a compiler is designed.
- Apply the techniques used in compiler construction.
- Construct components (few phase) of the compiler for the mini language

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(R18A0588) PYTHON PROGRAMMING LAB

COURSE OBJECTIVES

1. To write, test, and debug simple Python programs.
2. To implement Python programs with conditionals and loops.
3. Use functions for structuring Python programs.
4. Represent compound data using Python lists, tuples, and dictionaries.
5. Read and write data from/to files in Python.

LIST OF PROGRAMS:

Week 1:

A) Create a list and perform the following methods

- 1) insert() 2) remove() 3) append() 4) len() 5) pop() 6) clear()

B) Create a dictionary and apply the following methods

- 1) Print the dictionary items 2) access items 3) use get() 4) change values 5) use len()

C) Create a tuple and perform the following methods

- 1) Add items 2) len() 3) check for item in tuple 4) Access items

Week 2:

A) Write a python program to add two numbers.

B) Write a python program to print a number is positive/negative using if-else.

C) Write a python program to find largest number among three numbers.

D) Write a python Program to read a number and display corresponding day using if _elif _else?

Week 3:

A) Write a program to create a menu with the following options

1. TO PERFORM ADDITION 2. TO PERFORM SUBTRACTION

3. TO PERFORM MULTIPLICATION 4. TO PERFORM DIVISION

Accepts users input and perform the operation accordingly. Use functions with arguments.

B) Write a python program to check whether the given string is palindrome or not.

C) Write a python program to find factorial of a given number using functions

D) Write a Python function that takes two lists and returns True if they are equal otherwise false

Week 4:

A) Write a program to double a given number and add two numbers using lambda()?

B) Write a program for filter() to filter only even numbers from a given list.

C) Write a program for map() function to double all the items in the list?

D) Write a program to find sum of the numbers for the elements of the list by using reduce()?

Week 5:

A) Demonstrate a python code to implement abnormal termination?

B) Demonstrate a python code to print try, except and finally block statements

C) Write a python program to open and write "hello world" into a file?

D) Write a python program to write the content "hi python programming" for the existing file.

Week 6:

A) Write a python program to get python version.

B) Write a python program to open a file and check what are the access permissions acquired by that file using os module?

C) Write a python program to display a particular month of a year using calendar module.

D) Write a python program to print all the months of given year.

Week 7:

A) Write a python program to print date, time for today and now.

B) Write a python program to add some days to your present date and print the date added.

C) Write a python program to print date, time using date and time functions

D) Write a python program which accepts the radius of a circle from user and computes the area (use math module).

Week 8:

A) Write a python program to create a package (college),sub-package (alldept),modules(it,cse) and create admin and cabin function to module?

B) Write a python program to create a package (Engg), sub-package(years),modules (sem) and create staff and student function to module?

Week 9:

- A) Write a python Program to display welcome to MRCET by using classes and objects.
- B) Write a python Program to call data member and function using classes and objects.
- C) Write a program to find sum of two numbers using class and methods
- D) Write a program to read 3 subject marks and display pass or failed using class and object.

Week 10:

A) Using a numpy module create an array and check the following:

- 1. Type of array 2. Axes of array
- 3. Shape of array 4. Type of elements in array

B) Using a numpy module create array and check the following:

- 1. List with type float 2. 3*4 array with all zeros
- 3. From tuple 4. Random values

C) Using a numpy module create array and check the following:

- 1. Reshape 3X4 array to 2X2X3 array 2. Sequence of integers from 0 to 30 with steps of 5
- 3. Flatten array 4. Constant value array of complex type

Week 11:

- A) Write a python program to concatenate the dataframes with two different objects.
- B) Write a python code to read a csv file using pandas module and print the first and last five lines of a file.

Week 12:

- A) Write a python code to set background color and pic and draw a circle using turtle module
- B) Write a python code to set background color and pic and draw a square and fill the color using turtle module
- C) Write a python code to perform addition using functions with pdb module.

PLATFORM NEEDED Python 3 interpreter/Anaconda 3 or above for Windows/Linux

COURSE OUTCOMES

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

- Write, test, and debug simple Python programs.
- Implement Python programs with conditionals and loops.
- Develop Python programs step-wise by defining functions and calling them.
- Use Python lists, tuples, dictionaries for representing compound data.
- Read and write data from/to files in Python

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(R18A0006) Technical Communication and Soft Skills

INTRODUCTION:

Technical Communication and Soft skills focuses on enhancing students' communication. A thorough drill in grammar exercises is given. Various technical writing styles and skills are developed. The future placement needs of the students are met by giving them an exposure to group discussions and mockinterviews.

The students hone these skills under the guidance of instructor whose constant evaluation helps in the professional development. This course fulfills the need of the aspirants in acquiring and improving the skills required for placements and professional success.

OBJECTIVES:

- To make the students recognize the role of Technical English in their academic and professional fields.
- To improve language proficiency and develop the required professional skills.
- To equip students with tools to organize, comprehend, draft short and long forms of technical work.

The textbook prescribed for study is a manual that has been compiled by the department of English to meet the academic and professional needs of the students.

UNIT I – Personal Evaluation

Self-Assessment and Self-Awareness - Self-Esteem - Perception and Attitudes - Values and Beliefs - Time Management- Concord

UNIT 2 - Professional Communication

Extempore - Oral Presentations – Presentation Aids- Email Writing, Business Letter Writing - Memo Writing - Transformation of Sentences

UNIT 3 – Career Planning

Group Discussion, Interviews - Leadership Skills & Team Building - Personal Goal Setting and Career Planning - Complex Problem Solving - Creativity - Role and Responsibilities of an Engineer - Tenses

UNIT 4 - Technical Writing

Principles of Effective Writing - Editing Strategies to Achieve Appropriate Technical Style – Technical Report Writing - Voice

UNIT 5 - Ethics and Responsibilities

Personality Development in Social and Office Settings – Netiquettes - Work Culture and Cubicle Etiquettes - Correction of Sentences

REFERENCES:

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)
3. Shiv Khera, You Can Win, Macmillan Books, New York,2003.
4. Raman Sharma, Technical Communications, Oxford Publication, London,2004.
5. Meenakshi Raman, Prakash Singh, Business communication, Oxford Publication, New Delhi2012.
6. Dale Jung k, Applied Writing for Technicians, McGraw Hill, New York, 2004. (ISBN: 07828357-4)
7. Sharma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi2002.
8. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN0402213)

OUTCOMES:

- The students will be able to understand information which assists in completion of the assigned job tasks moresuccessfully.
- Students will be able to communicate their ideas by writing projects, reports, instructions, diagrams and many other forms of professionalwriting.
- Students will also be able to adhere to ethical norms of scientificcommunication.
- Students will be able to strengthen their individual and collaborative workstrategies

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(R18A0517) 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 frameworks.

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 chap8.
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 HolznerTataMcGraw-Hill.

Course Outcomes:

- Have understanding of designing a static web page and basics of internet.
- Gain knowledge of client side scripting, validation of forms and Struts programming
- Have understanding of server side scripting with PHP language
- Have understanding of what is XML and how to parse and use XML Data with Java
- To introduce Server side programming with Java Servlet, JSP and JDBC.

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(R18A1207) MOBILE APPLICATION DEVELOPMENT

UNIT-I

Introduction to Android Operating System: Android OS and Features – Android development framework;

Installing and running applications on Android Studio, Creating AVDs, Types of Android application; Creating Activities, Activity Life Cycle, Activity states, monitoring state changes;

UNIT - II

Android application components – Android Manifest file, Externalizing resources like Simple Values, Drawables, Layouts, Menus, etc,

Building User Interfaces: Fundamental Android UI design, Layouts – Linear, Relative, Grid and Table Layouts. User Interface (UI) Components

UNIT-III

Fragments – Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding, removing and replacing fragments with fragment transactions, interfacing between fragments and Activities,

UNIT-IV

Intents and Broadcasts: Using intents to launch Activities, Types of Intents, Passing data to Intents, Getting results from Activities, Broadcast Receivers – Using Intent filters to service implicit Intents, Resolving Intent filters;

UNIT-V

Database: Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and deleting data;

TEXT BOOKS:

1. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012
2. Android Application Development for Java Programmers, James C Sheusi, Cengage Learning, 2013

REFERENCES:

1. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013
2. Android Application Development (with Kitkat Support), Black Book, Pradeep Kothari, 2014, Dreamtech Press publisher, Kogent Learning Inc., 2014
3. Android Programming: Pushing the Limits, Erik Hellman, 1st Edition, Wiley Publications, 2014

Course Outcomes

1. Analyze architecture of android and current trends in mobile operating systems.
2. Apply suitable software tools and APIs for the development User Interface of a particular mobile application.
3. Apply intents and broadcast receivers in android application.
4. Develop and design apps for mobile devices using SQLiteDatabase.

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(R18A0518) Computer Networks

Objectives:

- To introduce the fundamental types of computernetworks.
- To demonstrate the TCP/IP & OSI model merits&demerits.
- To know the role of various protocols inNetworking.

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 controlalgorithms, 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; BA 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:

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

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**Professional Elective-II
(R18A0519) Computer Graphics**

Objectives

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

Unit-1:

Introduction - History of computer graphics, applications, graphics pipeline, video-display devices, raster-scan systems, random scan systems, 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-2:

Introduction to OpenGL - OpenGL architecture, primitives and attributes, simple modeling and rendering of two- and three-dimensional geometric objects, indexed and RGB color models, frame buffer, double buffering, 2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to viewport coordinate transformation, viewing functions.

Unit-3:

Geometric transformations- Homogeneous coordinates, affine transformations (translation, rotation, scaling, shear), concatenation, matrix stacks and use of model view matrix in OpenGL for these operations.

Unit-4:

Viewing - Classical three dimensional viewing, computer viewing, specifying views, parallel and perspective projective transformations; Visibility- z-Buffer, BSP trees, Open-GL culling, hidden-surface algorithms.

Shading - Light sources, illumination model, Gouraud and Phong shading for polygons. Rasterization- Line segment and polygon clipping, 3D clipping, scan conversion.

Unit-5:

Representation and Visualization- Bezier curves and surfaces, B-splines, visualization, interpolation, marching squares algorithm. Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

Text Books:

1. Edward Angel, Interactive Computer Graphics. A Top-Down Approach Using OpenGL (fifth Edition), Pearson Education, 2008.
2. Donald Hearn and Pauline Baker, Computer Graphics with OpenGL (third edition), Prentice Hall, 2003.
3. F. S. Hill Jr. and S. M. Kelley, Computer Graphics using OpenGL (third edition), Prentice Hall, 2006.
4. Peter Shirley and Steve Marschner, Computer Graphics (first edition), A. K. Peters, 2010 Web Resources: <http://www.graphicsforum.in> This website contains several resources relevant to this course; May be beneficial to both students / instructors.

Outcomes:

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

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Professional Elective-II (R18A0520) Distributed Systems

Objectives:

- To learn the principles, architectures, algorithms and programming models used in distributed systems.
- To examine state-of-the-art distributed systems, such as Google File System.
- To design and implement sample distributed systems.

UNIT I

Characterization of Distributed Systems: Introduction, Examples of Distributed systems, Resource sharing and web, challenges.

System models: Introduction, Architectural and Fundamental models, networking and Internetworking.

UNIT II

Time and Global States: Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global States.

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: Sun Network 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, Release consistency, 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 & Francis Group, 2007.

Outcomes:

- Students will identify the core concepts of distributed systems: the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way.
- Students will examine how existing systems have applied the concepts of distributed systems in designing large systems, and will additionally apply these concepts to develop sample systems.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**III Year B.Tech. CSE-II Sem****LT/P/DC****3 -/- 3****(R18A0521) CYBER SECURITY
(Professional Elective 2)****Course objectives:**

- To understand various types of cyber-attacks and cyber-crimes
- To learn threats and risks within context of the cyber security
- To have an overview of the cyber laws & concepts of cyber forensics
- To study the defensive techniques against these attacks

UNIT - I

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

UNIT - II

Cyberspace and the Law & Cyber Forensics: Introduction, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace, National Cyber Security Policy.

Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics

UNIT - III

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Organizational security Policies and Measures in Mobile Computing Era, Laptops.

UNIT- IV

Cyber Security: Organizational Implications: Introduction, cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations.

UNIT - V

Privacy Issues: Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domains- medical, financial, etc

Cybercrime: Examples and Mini-Cases

Examples: Official Website of Maharashtra Government Hacked, Indian Banks Lose Millions of Rupees, Parliament Attack, Pune City Police Bust Nigerian Racket, e-mail spoofing instances.

Mini-Cases: The Indian Case of online Gambling, An Indian Case of Intellectual Property Crime, Financial Frauds in Cyber Domain.

TEXT BOOKS:

1. Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley
2. B.B.Gupta, D.P.Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335, 2018.

REFERENCES:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Introduction to Cyber Security, Chwan-Hwa(john) Wu, J. David Irwin, CRC Press T&F Group.

Course Outcomes:

The students will be able to:

1. Analyze cyber-attacks, types of cybercrimes, cyber laws and also how to protect them self and ultimately the entire Internet community from such attacks.
2. Interpret and forensically investigate security incidents
3. Apply policies and procedures to manage Privacy issues
4. Design and develop secure software modules

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**OPEN ELECTIVE III
(R18A0452) 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.

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OPEN ELECTIVE III**(R18A0453) INTERNET OF THINGS & ITS APPLICATIONS****OBJECTIVES:**

- i) To study the fundamentals about IoT
- ii) To study about IoT Access technologies
- iii) To study the design methodology and different IoT hardware platforms.
- iv) To study the basics of IoT Data Analytics and supporting services.
- v) To study about various IoT case studies and industrial applications.

UNIT I: FUNDAMENTALS OF IoT- Evolution of Internet of Things, Enabling Technologies, M2M Communication, IoT World Forum (IoTWF) standardized architecture, Simplified IoT Architecture, Core IoT Functional Stack, Fog, Edge and Cloud in IoT, Functional blocks of an IoT ecosystem, Sensors, Actuators, Smart Objects and Connecting Smart Objects.

UNIT II: IoT PROTOCOLS- IoT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.11ah and Lora WAN, Network Layer: IP versions, Constrained Nodes and Constrained Networks, 6LoWPAN, Application Transport Methods: SCADA, Application Layer Protocols: CoAP and MQTT.

UNIT III: DESIGN AND DEVELOPMENT- Design Methodology, Embedded computing logic, Microcontroller, System on Chips, IoT system building blocks

IoT Platform overview: Overview of IoT supported Hardware platforms such as: Raspberry pi, Arduino Board details

UNIT IV: DATA ANALYTICS AND SUPPORTING SERVICES:

Data Analytics: Introduction, Structured Versus Unstructured Data, Data in Motion versus Data at Rest, IoT Data Analytics Challenges, Data Acquiring, Organizing in IoT/M2M,

Supporting Services: Computing Using a Cloud Platform for IoT/M2M Applications/Services, Everything as a service and Cloud Service Models.

UNIT V: CASE STUDIES/INDUSTRIAL APPLICATIONS: IoT applications in home, infrastructures, buildings, security, Industries, Home appliances, other IoT electronic equipments, Industry 4.0 concepts.

Text Books:

1. IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet

of Things, David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, Cisco Press, 2017

2. Internet of Things – A hands-on approach, Arshdeep Bahga, Vijay Madisetti, Universities Press, 2015
3. Internet of Things: Architecture, Design Principles And Applications, Rajkamal, McGraw Hill HigherEducation

Reference Books:

1. The Internet of Things – Key applications and Protocols, Olivier Hersent, David Boswarthick, Omar Elloumi and Wiley, 2012 (for Unit2).
2. “From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligence”,Jan Ho” ller, VlasiosTsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand. David Boyle and Elsevier, 2014.
3. Architecting the Internet of Things,Dieter Uckelmann, Mark Harrison, Michahelles and Florian (Eds), Springer,2011.
4. Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition,Michael Margolis,Arduino Cookbook and O”Reilly Media,2011.

Course Outcomes:

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

- Understand the basics of IoT.
- Implement the state of the Architecture of anIoT.
- Understand design methodology and hardware platforms involved in IoT.
- Understand how to analyze and organize the data.
- Compare IOT Applications in Industrial & realworld.

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(OPEN ELECTIVE - III)

(R18A1253) SOFTWARE TESTING TECHNIQUES

COURSE OBJECTIVES:

- 1) Knowing the concepts of Software Engineering and software development lifecycle.
- 2) Understanding the foundations, techniques, and tools in the area of software testing and its practice in the industry.
- 3) Learning the functional aspect of the various testing techniques.
- 4) Knowledge of the creation of test cases and usage of testing tools.

UNIT-I INTRODUCTION

Software, Software Engineering, Process Models: Waterfall Model, Spiral Model, Prototyping, V Model. Software Testing – Definition of Software Testing – Objective and limits of testing – Testing Strategy – Roles and Responsibilities of a Software Tester – Independent Verification and Validation.

SOFTWARE TESTING REQUIREMENTS

UNIT - II

Software Testing Requirements - Analyzing the requirements -Classifying the Functional and Non Functional Requirements. Software Testing Review Process - Objective of Software Testing Review - Types of Reviews: Peer Review – Walkthrough - Inspection - Checklists of Review Process - Review Log.

TESTING TECHNIQUES

UNIT - III

White box testing techniques – Static and Dynamic Testing – Statement Coverage – Decision/Branch Coverage – Basic Path Testing – Control Flow Graph Coverage – Conditional Coverage – McCabe's Cyclomatic Complexity – Mutation Testing. Black Box Test Techniques: Boundary Value Analysis – Equivalent Class Partition – Cause-Effect Analysis – Decision Table – State Transition Table – Pair Wise Testing – Use Case Testing.

TESTING TYPES

UNIT - IV

Unit Testing, Functional Testing: Smoke Testing – Integration, System Testing, User Acceptance Testing - Non Functional Testing:– Performance Testing – Recovery Testing – Security Testing – Compatibility Testing – Usability Testing – Ad Hoc Testing – Internationalization Testing – Configuration Testing - Data ware House Testing and Business Intelligence Testing – SOA Testing - Mobile Testing.

TEST CASE DESIGN

UNIT - V

Definition of Test Case - Standards, Guidelines and Naming Conventions – Characteristics

of Good Test Cases – Test Case templates – Creation of Test Case – Requirement Coverage –Traceability Matrix – Test Case Review Process – Test Execution – Test Log - Reporting of Test Execution – Definition of Risk - Risk Based Testing Approach.
Overview of Testing Tools like Winrunner, Loadrunner, Selenium, JMeter.

TEXT BOOKS :

1. Software Testing Techniques – BorisBeizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad,Dreamtech.
3. S.Subashni, N.Satheesh Kumar, Dr.B.G.Geetha, Dr.G.Singaravel, "Software Testing", Umayam Publications , First edition,2013.

REFERENCE BOOKS:

1. Srinivasan Desikan, GopalaswamyRamesh,"Software Testing: Principles and Practice", Pearson Education India, First Impression 2006.
2. Software Testing Techniques –SPD(Oreille)
3. Software Testing Concepts and Tools:P.NageshwarRao,dreamtechPress.
4. Art of Software Testing – Meyers, JohnWiley.
5. Software Testing in the Real World – Edward Kit,Pearson.

COURSE OUTCOMES:

- 1) Analyze the strategies for softwaretesting.
- 2) Identify the issues in test management and testingactivity.
- 3) Apply the suitable testing strategy for a given application.
- 4) Development of test cases and selection of appropriate testingtool.

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**OPEN ELECTIVE III
(R18A0355) 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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OPEN ELECTIVE III**(R18A0251) ELECTRICAL SYSTEMS & APPLICATIONS****COURSE OBJECTIVES:**

- 1) To introduce the fundamental concepts of electro mechanical 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- 1: Electrical System Components

LT system wiring components, Selection of Cables, Wires, Switches, Distribution Box, Metering System, Tariff structure, Protection Components- Fuse, MCB, MCCB, ELCB, Inverse current characteristics, Symbols, Single Line Diagram (SLD) of a wiring system, Contactor, Isolator, Relays, MPCB, Electric shock and Electrical safety practices.

UNIT- 2: Residential and Commercial Electrical Systems

Types of residential and commercial wiring systems, general rules and guidelines for installation. Load calculation and sizing of wire, rating of main switch, distribution board and protection devices. Earthing system calculations. Requirements of commercial installation- deciding lighting scheme and number of lamps, earthing of commercial installation, selection and sizing of components.

UNIT- 3: Illumination Systems

Understanding various terms related to light intensity, Lumens, candle power, lamp efficiency, specific consumption. Various illumination schemes- Incandescent lamps, modern luminaries like CFL, LED and their operation, energy saving in illumination systems, design of a lighting scheme for residential and commercial premises, flood lighting.

UNIT-4: Industrial Electrical Systems

UPS System-Types, Principle of operation. Battery banks, sizing the UPS and Battery Banks, Selection of UPS and Battery Banks.

UNIT-5: Single Phase AC Motor and Special Motors

Constructional features, Principle of operation, Characteristics, Speed control and Applications of Single phase AC motor, Stepper motor, Brushless DC motor and Universal motor (Qualitative Treatment only).

TEXT BOOKS

1. S. L. Uppal and G. C. Garg, "Electrical Wiring, Estimating & Costing", Khanna publishers, 2008.
2. K. B. Raina, "Electrical Design, Estimating & Costing", New age International, 2007.
3. H. Joshi, "Residential Commercial and Industrial Systems", McGraw Hill Education, 2008.

REFERENCE BOOKS:

1. N.V. Suryanarayana, *"Utilization of Electrical Power including Electric drives and Electric traction"*, New Age International (P) Limited Publishers, 1st Edition, 1994.
2. E. Open Shaw Taylor, *"Utilization of Electric Energy"*, Orient Longman, 1st Edition, 1937

COURSE OUTCOMES:

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

- 1) Maintain/Troubleshoot various lamps and fittings in use.
- 2) Design Illumination systems for various applications.
- 3) Utilize effectively the electrical systems in industries.

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**OPEN ELECTIVE III
(R18A0554) OPERATING SYSTEM CONCEPTS**

OBJECTIVES:

- To learn the fundamentals of Operating Systems.
- To learn the mechanisms of OS to handle processes and threads and their communication
- To learn the mechanisms involved in memory management in contemporary OS
- Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols

To know the components and management aspects of concurrency management

Unit I:

Introduction, objectives and functions of OS, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, OS services, system calls, system programs, virtual machines.

Unit-II:

Process Management:

Process concept, Process states, threads, **CPU Scheduling** - Scheduling algorithms, multiple processors and real time scheduling. **Process synchronization** – Critical section problems, Peterson's Solution, semaphores, monitors.

Unit-III:

Memory Management:

Basic concept, Logical and Physical addresses, contiguous memory allocation, swapping, paging, segmentation. **Virtual memory** – Basics of Virtual Memory, Demand Paging, Page Replacement algorithms, allocation of frames, thrashing.

Unit-IV: File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), Case study: UNIX, Windows.

Unit-V:

Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk attachment, disk management.

Dead locks: Characterization, Dead lock Prevention, Dead lock Avoidance, Dead lock Detection and Recovery.

Text Book:

1. Operating Systems Concepts –AvilSilberschatz j, Peter Galvin, GreyGagne

Reference:

1. Modern Operating Systems –Andrew S. Tanenbaum,PHI
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings,Prentice Hall ofIndia

OUTCOMES:

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

- Create processes andthreads.
- Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, ResponseTime.
- For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the accesstime.
- Design and implement file managementsystem.
- For a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/Ocontrollers.

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(R18A0589) 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 andStruts.

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 threeframes.

2) LOGIN PAGE

3) CATOLOGUE PAGE: The catalogue page should contain the details of all the books available in the web site in atable.

4) REGISTRATIONPAGE

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 characterslength).
- 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 digitsonly).
- 5. Last Name and Address** (should not beEmpty).

Week 4

Develop and demonstrate JavaScript with POP-UP boxes and functions for the following problems:

a) Input: Click on Display Date button using onclick() function

Output: Display **date** in thetextbox

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) AuthorName
- 3) ISBN number
- 4) Publishername
- 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, SPDO'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)

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(R18A1282) Mobile Application Development Lab

Course Objectives:

- ☐ To learn how to develop Applications in android environment.
- ☐ To learn how to develop user interface applications.
- ☐ To learn how to develop URL related applications.

List of Experiments

1. Installation of Android studio.
2. Development Of Hello World Application
3. Create an application that takes the name from a text box and shows hello message along with the name entered in text box, when the user clicks the OK button.
4. Create a screen that has input boxes for User Name, Password, Address, Gender(radio buttons for male and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a Submit button. On clicking the submit button, print all the data below the Submit Button (use any layout)
5. Design an android application to create page using Intent and one Button and pass the Values from one Activity to second Activity.
6. Design an android application Send SMS using Intent
7. Create an android application using Fragments
8. Design an android application Using Radiobuttons.
9. Design an android application for menu.
10. Create a user registration application that stores the user details in a database table.

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(R18A0007) Indian Constitution

Introduction

The Indian judiciary and particularly the Supreme Court of India has played an historic role as the guardian of people. It has been protecting not only basic ideals of the Constitution but also strengthened the same through progressive interpretations of the text of the Constitution. The judicial activism of the Supreme Court of India and its historic contributions has been recognized throughout the world and it gradually made it “as one of the strongest court in the world”.

This course “Indian Constitution” has been designed to develop understanding of the Indian Constitution among the students.

Objectives:

- To enable the students to understand the constitution’s origin and its power.
- To enable the students to analyze the political principles.
- To enable the students to be aware of their fundamental rights and duties.

The following course content is prescribed for this course.

UNIT –I

Meaning of constitution law and constitutionalism, Historical perspective of the constitution of India, Salient features and characteristics of the constitution of India

UNIT –II

Scheme of fundamental rights, The scheme of the fundamental duties and its legal status, The Directive Principles of State Policy- its importance and implementation

UNIT –III

Federal structure and distribution of legislative and financial powers between the Union and the States, Parliamentary Form of Government in India- the constitution powers and status of the president of India, Amendment of the Constitutional Powers and Procedure

UNIT –IV

The historical perspectives of the constitutional amendments in India. Emergency provisions: National Emergency, President Rule, Financial Emergency, Local self government- Constitutional scheme in India

UNIT –V

Scheme of fundamental Right to Equality, Scheme of fundamental Right to certain Freedom under Article 19, Scope of the Right to Life and Personal Liberty under Article 21

OUTCOMES:

Students will be able to:

- improve their knowledge about Indian constitution
- Value their identity and exercise their fundamental rights.
- Understand how differently government bodies function.

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(R18A0522) Software Testing Methodologies

Course Outcomes:

- Ability to apply the process of testing and various methodologies in testing for developed software.
- Ability to write test cases for given software to test it before delivery to the customer.

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, Control-flow Graph ,path sensitizing, path instrumentation, application of path testing. Transaction Flow Testing:-transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT – III: 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. Basics of Regression Testing(RTS)

TEXT BOOKS:

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

REFERENCE BOOKS:

- The craft of software testing – Brian Marick, Pearson Education.
- Software Testing, 3rd edition, P.C. Jorgensen, Aurbach Publications (Dist.by SPD).
- Software Testing, N.Chauhan, Oxford University Press.
- Introduction to Software Testing, P.Ammann & J. Offutt, Cambridge Univ. Press.
- Effective methods of Software Testing, Perry, John Wiley, 2nd Edition, 1999.

- Software Testing Concepts and Tools, P.Nageswara Rao, dreamtechPress.
- Software Testing, M.G.Limaye,TMH.
- Software Testing, S.Desikan, G.Ramesh,Pearson.
- Foundations of Software Testing, D.Graham& Others, CengageLearning.
- Foundations of Software Testing, A.P.Mathur,Pearson.

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(R18A0523) CLOUD COMPUTING

COURSE OBJECTIVES

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

UNIT- I

Cloud Computing Fundamentals: Definition of Cloud computing, Roots of Cloud Computing , Layers and Types of Clouds, Desired Features of a Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers. **Computing Paradigms:** High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing.

UNIT- II

Migrating into a Cloud: Introduction, Broad Approaches to Migrating into the Cloud, the Seven-Step Model of Migration into a Cloud, Enriching the 'Integration as a Service' Paradigm for the Cloud Era, the Onset of Knowledge Era the Evolution of SaaS, Evolution of Saas.

UNIT- III

Infrastructure as a Service (IAAS) & Platform (PAAS): Virtual machines provisioning and Migration services, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action. On the Management of Virtual machines for Cloud Infrastructures- Aneka—Integration of Private and Public Clouds.

UNIT- IV

Software as a Service (SAAS) & Data Security in the Cloud: Software as a Service SAAS), Google App Engine – Centralizing Email Communications- Collaborating via Web-Based Communication Tools-An Introduction to the idea of Data Security.

UNIT- V

SLA Management in cloud computing: Traditional Approaches to SLO Management, Types of SLA, Life Cycle of SLA, SLA Management in Cloud.

TEXT BOOKS:

1. Cloud Computing Principles and Paradigms, by Rajkumar Buyya
2. Essentials of cloud Computing: K. Chandrasekhran, CRC press, 2014
3. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

4. Cloud Computing, A Practical Approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, TMH

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

COURSE OUTCOMES:

- Ability to analyze various service delivery models of cloud computing
- Ability to interpret the ways in which the cloud can be programmed and deployed.
- Ability to comprehend the virtualization and cloud computing concepts
- Assess the comparative advantages and disadvantages of Virtualization technology
- Analyze authentication, confidentiality and privacy issues in cloud computing

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(R18A0524)Data Warehousing and Data Mining

Objectives:

Study data warehouse principles and its working learn data mining concepts understand association rules mining. Discuss classification algorithms learn how data is grouped using clustering techniques.

UNIT-I

Data warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction-Transformation-Loading, Logical(Multi-Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact-Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture-ROLAP, MOLAP andHOLAP.

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 ItemSet.

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.

UNIT-V

Clustering: Clustering Overview, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Partitioning Clustering-K-Means Algorithm, PAM Algorithm; Hierarchical Clustering-Agglomerative Methods and divisive methods, Basic Agglomerative Hierarchical Clustering Algorithm, Key Issues in Hierarchical Clustering, Strengths and Weakness, Outlier Detection.

TEXT BOOKS:

- 1) Data Mining- Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006.
- 2) Introduction to Data Mining, Psng-Ning Tan, Vipin Kumar, Michael Steinbach, Pearson Education.

REFERENCE BOOKS:

- 1) Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.
- 2) Data Warehousing Fundamentals, Pualraj Ponnaiah, Wiley Student Edition.
- 3) The Data Warehouse Life Cycle Toolkit — Ralph Kimball, Wiley Student Edition.
- 4) Data Mining, Vikaram Pudi, P Rddha Krishna, Oxford University Press

Outcomes:

- Student should be able to understand why the data warehouse in addition to database systems.
- Ability to perform the pre-processing of data and apply mining techniques on it.
- Ability to identify the association rules, classification and clusters in large datasets.
- Ability to solve real world problems in business and scientific information using data mining

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(R18A0525) 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 and addresses. **Awk** - Execution, Fields and Records, Scripts, Operation, Patterns and 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, 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 program,.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI.
2. Unix Concepts and Applications, 4th Edition, SumitabhaDas, TMH, 2006.
3. Unix Network Programming, W.R.Stevens, PHI

OUTCOMES:

1. Identify and use Linux utilities to create and manage simple file processing operations
2. Develop shell scripts to perform more complex tasks.
3. Illustrate file processing operations such as standard I/O and formatted I/O.
4. Generalize Signal generation and handling signals.
5. Develop client server Inter Process Communication (IPC) Mechanisms.
6. Illustrate multithreading concepts to reduce the wastage of CPU time.

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(R18A0526)MACHINE LEARNING

COURSE OBJECTIVES:

1. Understand the fundamentals of Machine Learning.
2. Acquire theoretical knowledge on various ML algorithms.
3. Learn Probabilistic Learning Algorithms for applying in real world applications.
4. Understand the concepts of Reinforcement Learning and to evaluate hypothesis.
5. Understand the working of Genetic Algorithms.

Unit I

Introduction to Machine Learning

Introduction ,Components of Learning , Learning Models , Geometric Models, Probabilistic Models, Logic Models, Grouping and Grading, Designing a Learning System, Types of Learning, Supervised, Unsupervised, Reinforcement, Perspectives and Issues.

Unit II

Supervised and Unsupervised Learning

Decision Trees: ID3, Classification and Regression Trees, Regression: Linear Regression, Multiple Linear Regression, Logistic Regression, Neural Networks: Introduction, Perception, Multilayer Perception, Support Vector Machines: Linear and Non-Linear, Kernel Functions, K Nearest Neighbors. Introduction to clustering, K-means clustering

Unit III

Ensemble and Probabilistic Learning

Model Combination Schemes, Voting, Error-Correcting Output Codes, Bagging: Random Forest Trees, Boosting: Adaboost, Stacking. Gaussian mixture models - The Expectation-Maximization (EM) Algorithm, Information Criteria, Nearest neighbor methods - Nearest Neighbor Smoothing, Efficient Distance Computations: the KD-Tree, Distance Measures.

Unit IV

Reinforcement Learning and Evaluating Hypotheses

Introduction, Learning Task, Q Learning: the Q Function, An Algorithm for Learning Q, An Illustrative Example, Convergence, Experimentation Strategies, Updating Sequence.
Motivation, Estimation Hypothesis Accuracy, Version Spaces, Finite and Infinite Hypothesis Spaces, PAC Learning, VC Dimension.

UNIT V

Genetic Algorithms: Motivation, Genetic Algorithms: Representing Hypotheses, Genetic Operator, Fitness Function and Selection, An Illustrative Example, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning: Lamarkian Evolution, Baldwin Effect, Parallelizing Genetic Algorithms.

TEXT BOOKS:

1. Tom Mitchell, "Machine Learning", McGraw Hill, 3rd Edition, 1997.
2. Ethem Alpaydin, "Introduction to Machine Learning", MIT Press, Prentice Hall of India, 3rd Edition 2014.
3. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar " Foundations of Machine Learning", MIT Press, 2012.

REFERENCE BOOKS

1. Charu C. Aggarwal, "Data Classification Algorithms and Applications", CRC Press, 2014.
2. Charu C. Aggarwal, "DATA CLUSTERING Algorithms and Applications", CRC Press, 2014.
3. Kevin P. Murphy "Machine Learning: A Probabilistic Perspective", The MIT Press, 2012
4. Jiawei Han and Micheline Kamber and Jian Pei, "Data Mining Concepts and Techniques", 3rd edition, Morgan Kaufman Publications, 2012.

COURSE OUTCOMES:

1. Analyze the characteristics of Machine Learning techniques that enable to solve real world problems
2. Implement machine learning strategies.
3. Apply various supervised and unsupervised learning methods to appropriate problems.
4. Identify and integrate more than one technique to enhance the performance of learning.
5. Create probabilistic learning models for handling unknown pattern.

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Professional elective-III (R18A0527) Mobile Computing

Course Objectives:

- To make the student understand the concept of mobile computing paradigm, its novel applications and limitations.
- To understand the typical mobile networking infrastructure through a popular GSM protocol
- To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
- To understand the database issues in mobile environments & data delivery models.
- To understand the ad hoc networks and related concepts.
- To understand the platforms and protocols used in mobile environment.

UNIT - I

Introduction: Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT.

UNIT – II

(Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11)

Mobile Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT – III

Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

Database Issues: Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

UNIT - IV

Data Dissemination and Synchronization: Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols

UNIT - V

Mobile Adhoc Networks (MANETs): Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc. , Mobile Agents, Service Discovery.

Protocols and Platforms for Mobile Computing: WAP, Bluetooth, XML, J2ME, Java Card, Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Addison-Wesley, Second Edition, 2009.
2. Raj Kamal, “Mobile Computing”, Oxford University Press, 2007, ISBN:0195686772.

REFERENCE BOOKS:

1. Jochen Schiller, “Mobile Communications”, Addison-Wesley, Second Edition, 2004.
2. Stojmenovic and Cacute, “Handbook of Wireless Networks and Mobile Computing”, Wiley, 2002, ISBN0471419028.
3. Reza Behravanfar, “Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML”, ISBN: 0521817331, Cambridge University Press, Oct2004.

Course Outcomes:

- Able to think and develop new mobile application.
- Able to take any new technical issue related to this new paradigm and come up with a solution(s).
- Able to develop new ad hoc network applications and/or algorithms/protocols.
- Able to understand & develop any existing or new protocol related to mobile environment

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Professional elective-III (R18A0528) Service Oriented Architecture

OBJECTIVES:

- The student should be made to:
- Learn XML fundamentals.
- Be exposed to build applications based on XML.
- Understand the key principles behind SOA.
- Be familiar with the web services technology elements for realizing SOA.
- Learn the various web service standards.

UNIT I:

Introduction to XML :XML document structure – Well formed and valid documents – Namespaces – DTD – XML Schema X-Files.

UNIT II

Building XML- Based Application Parsing XML – using DOM, SAX – XML Transformation and XSL – XSL

Formatting – Modeling Databases in XML.

UNIT III

Service oriented Architecture Characteristics of SOA, Comparing SOA with Client-Server and Distributed

architectures – Benefits of SOA -- Principles of Service orientation – Service layers.

UNIT IV

Web Services Service descriptions – WSDL – Messaging with SOAP – Service discovery – UDDI – Message

Exchange Patterns – Orchestration – Choreography –WS Transactions.

UNIT V

Building SOA-Based Application Service Oriented Analysis and Design – Service Modeling – Design standards and guidelines - Composition – WS-BPEL – WS-Coordination – WS-Policy – WS-Security – SOA support in J2EE.

TEXTBOOKS:

1. Ron Schmelzer et al. "XML and Web Services", Pearson Education, 2002
2. Thomas Erl, "Service Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2005.

REFERENCES:

1. Frank P.Coyle, "XML, Web Services and the Data Revolution", Pearson Education,2002.
2. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Pearson Education,2005.
3. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect'sGuide", Prentice Hall, 2004.
4. James McGovern,Sameer Tyagi, Michael E.Stevens, Sunil Mathew, "Java Web. Services Architecture", Morgan Kaufmann Publishers, 2003.

OUTCOMES:

Upon successful completion of this course,

- Students will be able to: x Build applications based onXML.
- Develop web services using technologyelements.
- Build SOA-based applications for intra-enterprise and inter-enterpriseapplications.

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(R18A0590) Linux Programming Lab

Objectives:

- To write shell scripts to solve problems
- To implement some standard Linux utilities such as ls, cp etc using systemcalls.
- 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 illustrates communication between two processes using unnamed pipes

b) Write a C program that illustrates communication between two processes 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 a message queue and displays 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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(R18A0591) Software Testing Methodologies Lab

1. Write programs in „C“Language to demonstrate the working of the followinga.constructs:
i) do...while ii) while....do iii) if...else iv) switch v) for
2. —A program written in „C“language for Matrix Multiplication fails Introspect the causes foritsfailureandwritedownthepossiblereasonsforitsfailure.
3. Take any system (e.g.ATMsystem) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Bankingapplication)
5. Write the test cases forGMAIL
6. Write the test cases for FACEBOOK,TWITTER etc.,
7. Create a test plan document for any application (e.g. Library Management System)
- 8.Study of any web testing tool (e.g.Selenium)

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(R18A0529) Big-Data Analytics

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 AnalyticsTools

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 CASSANDRA

MongoDB: Why Mongo DB - Terms used in RDBMS and Mongo DB - Data Types - MongoDB Query Language Cassandra: Features - CQL Data Types – CQLSH – Keyspaces - CRUD Operations – Collections - Using a Counter - Time to Live - Alter Commands - Import and Export - Querying System Tables

UNIT IV

INTRODUCTION TO MAPREDUCE PROGRAMMING AND HIVE

MapReduce: Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression 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 - Hive Analytic Functions

UNIT V

INTRODUCTION TO PIG & JASPERREPORTS

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 - JasperReport using Jaspersoft..

Reference Book:

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

Text Book:

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

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Professional Elective-IV (R18A0530) Parallel and Distributed Computing

Course Objective: To learn the advanced concepts of Parallel and Distributed Computing and its implementation for assessment of understanding the course by the students

UNIT-I

Introduction: Scope , issues, applications and challenges of Parallel and Distributed Computing

Parallel Programming Platforms: Implicit Parallelism: Trends in Microprocessor Architectures, Dichotomy of Parallel Computing Platforms, Physical Organization, co-processing.

UNIT-II

Principles of Parallel Algorithm Design: Decomposition Techniques, Characteristics of Tasks and Interactions, Mapping Techniques for Load Balancing.

CUDA programming model: Overview of CUDA, Isolating data to be used by parallelized code, API function to allocate memory on parallel computing device, to transfer data.

UNIT-III

Analytical Modeling of Parallel Programs: Sources of Overhead in Parallel Programs, Performance Metrics for Parallel Systems, The Effect of Granularity on Performance, Scalability of Parallel Systems, Minimum Execution Time and Minimum Cost Optimal Execution Time

UNIT-IV

Dense Matrix Algorithms: Matrix-Vector Multiplication, Matrix-Matrix Multiplication, Issues in Sorting on Parallel Computers, Bubble Sort and Variants, Quick Sort Algorithm.

UNIT-V

Search Algorithms for Discrete Optimization Problems: Sequential Search Algorithms, Parallel Depth-First Search, Parallel Best-First Search, Speed up Anomalies in Parallel Search Algorithms

Recommended Books:

1. A Grama, AGupra, G Karypis, V Kumar. Introduction to Parallel Computing (2nd ed.). Addison Wesley,2003.
2. C Lin, L Snyder. Principles of Parallel Programming. USA: Addison-Wesley Publishing Company,2008.
3. J Jeffers, J Reinders. Intel Xeon Phi Coprocessor High-Performance Programming.Morgan Kaufmann Publishing and Elsevier,2013.

4 T Mattson, B Sanders, B Massingill. Patterns for Parallel Programming. Addison-Wesley Professional,

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Professional Elective-IV (R18A0531) Internet of Things

Objectives:

- To introduce the terminology, technology and its applications
- To explain the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To elucidate the Raspberry PI platform, that is widely used in IoT applications
- To explain the implementation of web based services on IoT devices

Unit I

Introduction to Internet of Things –Definition and Characteristics of IoT,
Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs
IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates
Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

Unit II

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT
Basics of IoT System Management with NETCONF, YANG- NETCONF, YANG, SNMP NETOPEER

Unit III

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling
Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib

Unit IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C)
Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

Unit V

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs
Webserver – Web server for IoT, Cloud for IoT, Python web application framework
Designing a RESTful web API

Course Outcomes :

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

1. Explain the importance and usage of IoT.
2. Describe the various IoT levels and protocols.
3. Develop programs in Python.
4. Illustrate the functioning of IoT devices.
5. Relate IoT to cloud computing and web applications.

TEXT BOOK:

Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547

Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

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Professional Elective-IV (R18A0532) Advanced Algorithms

OBJECTIVES:

- To review the basic algorithm design strategies and understand the advanced algorithm design, development, and analysis techniques, various aspects of advanced algorithms and Classification.
- Study and analysis of parallel, probabilistic and randomized algorithms.

UNIT-I

Design Paradigms

Overview:- Overview of algorithm design paradigms- Divide and Conquer, Greedy and Dynamic Programming strategies. Basic search and traversal techniques for graphs, Backtracking, Branch and Bound.

UNIT-II

Max Flow Problem

String Matching:- Introduction to string-matching problem, Naïve algorithm, Rabin Karp, Knuth Morris Pratt, Boyer- Moore algorithms and complexity analysis.

UNIT-III

Theory of NP- Hard and NP-Complete Problems

Introduction:- P, NP and NP-Complete complexity class problems and examples; A few NP-Completeness proofs; other complexity classes.

Approximation Algorithms: Introduction, Combinatorial Optimization, approximation factor, PTAS, FPTAS, Approximation algorithms for vertex cover, set cover, TSP, knapsack, bin packing, subset-sum problem etc. Analysis of the expected time complexity of the algorithms.

UNIT-IV

Parallel Algorithms

Introduction, Models, Speedup and efficiency. Some basic techniques. Examples from graph theory, sorting, Parallel sorting networks. Parallel algorithms and their parallel time and processors complexity.

UNIT-V

Probabilistic Algorithms & Randomized Algorithms

Numerical probabilistic algorithms, Las Vegas and Monte Carlo algorithms, Game-theoretic techniques, Applications on graph problems

TEXT BOOKS:

1. "Introduction to Algorithms", Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Third Edition, PHIPublication.
2. Approximation Algorithms: VijayV.Vazirani
3. Randomized Algorithms: R. Motwani andP.Raghavan
4. "Data Structures and Algorithms in C++", M.T. Goodrich, R. Tamassia and D.Mount, Wiley India.

REFERENCES:

1. Algorithmics: The spirit ofcomputing-D.Harel
2. Fundamentals of Computer Algorithms, Ellis Horowitz, Sartaj Sahni, SanguthevarRajasekaran, Second Edition, GalgotiaPublication
3. Data structures with C++, J. Hubbard, Schaum'soutlines,TMH.
4. Data structures and Algorithm Analysis in C++, 3rd edition, M. A. Weiss,Pearson.
5. Classic Data Structures, D. Samanta, 2nd edition,PHI.
6. Fundamentals of Algorithmics :G.BrassardandP.Bratley

OUTCOMES :By the end of the semester student should be able to

- To analyze the fundamental algorithm designstrategies.
- Understand the advanced algorithm design, development, and analysestechniques,
- Demonstrate various aspects of advanced algorithms and classifythem.
- Design and analyze of parallel, probabilistic and randomizedalgorithms.

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Professional Elective-V (R18A0533) Soft Computing

Objectives:

- To give the students an overall knowledge of soft computing theories and fundamentals.
- To give an understanding on the fundamentals of non-traditional technologies and approaches to solving hard real-world problems. Fundamentals of artificial neural networks, fuzzy sets and fuzzy logic and genetic algorithms. Use of ANN, Fuzzy sets to solve hard real-world problems. An overview of Genetic algorithms and machine learning techniques to solving hard real-world problems.

UNIT I

Evolution of Computing - Soft Computing Constituents - From Conventional AI to Computational Intelligence, Heuristic Search Techniques- Generate and Test, Hill Climbing, Best First Search Problem reduction, Constraint Satisfaction and Means End Analysis. Approaches to Knowledge Representation - Using Predicate Logic and Rules.

UNIT II

Artificial Neural Networks: Introduction, Basic models of ANN, important terminologies, Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Back propagation Network, Associative Memory Networks. Training Algorithms for pattern association, BAM and Hopfield Networks.

UNIT III

Unsupervised Learning Network- Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks. Special Networks - Introduction to various networks.

UNIT IV

Introduction to Classical Sets (crisp Sets) and Fuzzy Sets- operations and Fuzzy sets. Classical Relations -and Fuzzy Relations- Cardinality, Operations, Properties and composition. Tolerance and equivalence relations.

Membership functions- Features, Fuzzification, membership value assignments, Defuzzification.

UNIT V

Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning Fuzzy Decision making.

Fuzzy Logic Control Systems, Genetic Algorithm- Introduction and basic operators and terminology, Applications: Optimization of TSP, Internet Search Technique.

TEXT BOOKS:

1. Principles of Soft Computing- S N Sivanandam, S N Deepa, Wiley India,2007.
2. Soft Computing and Intelligent System Design -Fakhreddine O Karray, Clarence D Silva, Pearson Edition,2004.

REFERECE BOOKS:

1. Artificial Intelligence and SoftComputing- Behavioural and Cognitive Modeling of the Human BrainAmitKonar, CRC press, Taylor and FrancisGroup.
2. Artificial Intelligence – Elaine Rich and Kevin Knight, TMH, 1991,rp2008.
3. Artificial Intelligence – Patric Henry Winston – Third Edition, PearsonEducation.
4. A first course in Fuzzy Logic-Hung T Nguyen and Elbert A Walker, CRC. Press Taylor and Francis Group.
5. Artificial Intelligence and Intelligent Systems, N.P.Padhy, Oxford Univ.Press

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Professional Elective-V (R18A0534) Block Chain Technology

Course Objectives

- To enable the student to understand and appreciate, the importance of fundamentals of blockchain technology and application of cryptography in blockchain.
- To gain the awareness about the concepts of various implementations of blockchain technology such as bitcoin, Ethereum, and Hyperledger

UNIT - I

Introduction to Blockchain Technology – Distributed systems – The history of blockchain – Introduction to blockchain – CAP theorem and blockchain – Benefits and limitations of blockchain – Decentralization using blockchain - Methods of decentralization – Routes to decentralization

UNIT-II

Cryptography in Blockchain: Introduction – cryptographic primitives – Assymmetric cryptography – public and private keys -line interface – Bitcoin improvement proposals (BIPs) – Consensus Algorithms.

UNIT – III

BitCoin- Introduction – Transactions – Structure - Transactions types – The structure of a block– The genesis block – The bitcoin network– Wallets and its types– Bitcoin payments– Bitcoin investment and buying and selling bitcoins – Bitcoin installation – Bitcoin programming and the command-line interface – Bitcoin improvement proposals (BIPs).

UNIT-IV

Ethereum - Ethereum blockchain- Elements of the Ethereum blockchain– Precompiled contracts – Accounts and its types – Block header- Ether – Messages – Mining - Clients and wallets – Trading and investment – The yellow paper - The Ethereum network - Applications developed on Ethereum - Scalability and security issues.

UNIT-V

Smart Contract and Hyperledger – – History of Smart Contract – Ricardian contracts - The DAO. Hyperledger projects - Hyperledger as a protocol – Fabric - Hyperledger Fabric - Sawtooth lake – Corda Architecture.

TEXT BOOKS:

1. I. Bashir, *Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained, 2nd Edition*, 2nd Revised edition edition. Birmingham: Packt Publishing, 2018.

REFERENCE BOOKS:

1. A. M. Antonopoulos, *Mastering bitcoin*, First edition. Sebastopol CA: O'Reilly, 2015.
2. Z. Zheng, S. Xie, H. Dai, X. Chen, and H. Wang, "An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends," in 2017 IEEE International Congress on Big Data (BigData Congress), 2017, pp.557–564.

Course Outcomes:

- Students will be able to
- To understand the fundamentals of blockchain technology.
- Apply knowledge of implementations of Bitcoin, Ethereum and Hyperledger to develop solutions in the appropriated domains.

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Professional Elective-V (R18A0535)Image Processing

Course Objectives:

- To comprehend the relation between human visual system and machine perception and processing of digital images.
- To provide a detailed approach towards image processing applications like enhancement, segmentation, and compression.

Course Outcomes:

- Exploration of the limitations of the computational methods on digital images.
- Expected to implement the spatial and frequency domain image transforms on enhancement and restoration of images.
- Elaborate understanding on image enhancement techniques.
- Expected to define the need for compression and evaluate the basic compression algorithms.

UNIT – I: Digital Image Fundamentals & Image Transforms: Digital Image Fundamentals, Sampling and Quantization, Relationship between Pixels. Image Transforms: 2-D FFT, Properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar Transform, Slant Transform, Hotelling Transform.

UNIT – II: Image Enhancement (Spatial Domain): Introduction, Image Enhancement in Spatial Domain, Enhancement through Point Processing, Types of Point Processing, Histogram Manipulation, Linear and Non – Linear Gray Level Transformation, Local or Neighborhood criterion, Median Filter, Spatial Domain High-Pass Filtering. Image Enhancement (Frequency Domain): Filtering in Frequency Domain, Low Pass (Smoothing) and High Pass (Sharpening) Filters in Frequency Domain.

UNIT – III: Image Restoration: Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT – IV: Image Segmentation: Detection of Discontinuities, Edge Linking And Boundary Detection, thresholding, Region Oriented Segmentation. Morphological Image Processing: Dilation and Erosion: Dilation, Structuring Element Decomposition, Erosion, Combining Dilation and Erosion, Opening and Closing, Hit or Miss Transformation.

UNIT – V: Image Compression: Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

TEXT BOOKS:

- Digital Image Processing – Rafael C. Gonzalez, Richard E. Woods, 3rd Edition, Pearson, 2008
- Digital Image Processing- S Jayaraman, S Esakkirajan, T Veerakumar- MC GRAW HILL EDUCATION, 2010.

REFERENCE BOOKS:

- Digital Image Processing and Analysis-Human and Computer Vision Application with using CVIP Tools – Scotte Umbaugh, 2nd Ed, CRC Press, 2011
- Digital Image Processing using MATLAB – Rafael C. Gonzalez, Richard E Woods and Steven L. Eddings, 2nd Edition, MC GRAW HILL EDUCATION, 2010.
- Digital Image Processing and Computer Vision – Somka, Hlavac, Boyle- Cengage Learning (Indian edition) 2008.
- Introductory Computer Vision Imaging Techniques and Solutions- Adrian Low, 2008, 2nd Edition