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: mrcet2004@gmail.com, website: www.mrcet.ac.in

BACHELOR OF TECHNOLOGY

INFORMATIONTECHNOLOGY

Course Structure &Syllabus

(Batches admitted from the academic year 2018 - 2019)

Note: The regulations here under 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 AcademicCouncil.

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 CollegeStatutes.

- ‒AcademicAutonomy‖meansfreedomtotheCollegeinallaspectsofconductingits academic programs, granted by the University for promotingexcellence.

- ‒Commission‖ means UniversityGrantsCommission.

- ‒AICTE‖meansAllIndiaCouncil for TechnicalEducation.

- ‒University‖theJawaharlal Nehru TechnologicalUniversity,Hyderabad.

- ‒College‖meansMallaReddyCollegeofEngineering&Technology,Secunderabad unless indicated otherwise by thecontext.

- ‒Program‖means:
  - Bachelor of Technology (B.Tech) degreeprogram
  - UG Degree Program:B.Tech

- ‒Branch‖meansspecialization in a program like B.Tech degree program in Electronics & Communication Engineering, B.Tech degree program in Computer Science and Engineeringetc.

- ‒Course‖or‒Subject‖meansatheoryorpracticalsubject,identifiedbyitscourse– number and course-title, which is normally studied in asemester.

- 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 autonomousstatus.

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 thesociety.

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 modernsociety.

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 PioneeringOrganizations.

QUALITY POLICY

- To implement best practices in Teaching and Learning process for both UG and PG coursesmeticulously.
- To provide state of art infrastructure and expertise to impart qualityeducation.
- 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 afteryear.

For more information: www.mrcet.ac.in

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE STRUCTURE

I Year B. Tech (IT) – I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0001	English	2	-	-	2	30	70
2	R18A0021	Mathematics – I	3	1	-	4	30	70
3	R18A0013	Applied Physics	3	-	-	3	30	70
4	R18A0301	Engineering Graphics	1	-	4	3	30	70
5	R18A0501	Programming For Problem Solving	3	-	-	3	30	70
6	R18A0082	Engineering/IT Workshop	-	-	4	2	30	70
7	R18A0581	Programming For Problem Solving Lab	-	-	3	1.5	30	70
8	R18A0081	English Language Communication Skills Lab	-	-	3	1.5	30	70
TOTAL			**12**	**01**	**14**	**20**	**240**	**560**

I Year B. Tech (IT) – IISemester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R18A0002	Professional English	2	-	-	2	30	70
2	R18A0022	Mathematics – II	3	1	-	4	30	70
3	R18A0012	Engineering Chemistry	3	-	-	3	30	70
4	R18A0502	Object Oriented Programming	3	-	-	3	30	70
5	R18A0201	Basic Electrical Engineering	3	-	-	3	30	70
6	R18A0083	Engineering Physics/Chemistry Lab	-	-	4	2	30	70
7	R18A0582	Object Oriented Programming Lab	-	-	3	1.5	30	70
8	R18A0281	Basic Electrical Engineering Lab	-	-	3	1.5	30	70
9*	R18A0003	Human Values & Societal Perspectives	2	-	-	0	100	-
TOTAL			**16**	**01**	**10**	**20**	**340**	**560**

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

II Year B.Tech (IT) - ISemester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A1201	Computer Organization and Architecture	3	0	0	3	30	70
2	R18A0503	Data Structures	3	0	0	3	30	70
3	R18A0504	Operating Systems	3	0	0	3	30	70
4	R18A0506	Discrete Mathematics	3	0	0	3	30	70
5	R18A0024	Probability and Statistics	3	0	0	3	30	70
6	R18A0461	Analog and Digital Electronics	3	0	0	3	30	70
7	R18A0583	Operating Systems Lab	0	0	3	1.5	30	70
8	R18A0584	Data Structures Lab	0	0	3	1.5	30	70
9*	R18A0004	Foreign Languages : French	2	0	0	-	100	-
TOTAL			**20**	**0**	**06**	**21**	**340**	**560**

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

II Year B.Tech (IT) - IISemester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A0511	Software Engineering	3	0	0	3	30	70
2	R18A1202	Automata and compiler design	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	****	Open Elective - 1	3	0	0	3	30	70
6	R18A0061	Managerial Economics and Financial Analysis	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 Sciences	2	0	0	-	100	-
TOTAL			**20**	**0**	**06**	**21**	**340**	**560**

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

III Year B.Tech (IT) - ISemester

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	R18A0513	Python Programming	3	0	0	3	30	70
3	R18A0517	Web Technologies	3	0	0	3	30	70
4	R18A0464	Embedded Systems	3	0	0	3	30	70
5	R18A1203 R18A0519 R18A1205	Professional Elective 1: 1. KnowledgeManagement 2. ComputerGraphics 3. ArtificialIntelligence	3	0	0	3	30	70
6		Open Elective - 2	3	0	0	3	30	70
7	R18A0588	Python Programming Lab	0	0	3	1.5	30	70
8	R18A0589	Web Technologies Lab	0	0	3	1.5	30	70
9*	R18A0006	Technical Communication and Soft Skills	2	0	0	-	100	-
TOTAL			**20**	**0**	**06**	**21**	**340**	**560**

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

III Year B.Tech (IT) - II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A0518	Computer Networks	3	0	0	3	30	70
2	R18A0524	Data Warehousing and Data Mining	3	0	0	3	30	70
3	R18A0525	Linux Programming	3	0	0	3	30	70
4	R18A0520 R18A0521 R18A0527	Professional Elective 2: 1.Distributed Systems 2.Cyber Security 3. Mobile Computing	3	0	0	3	30	70
5		Open Elective - 3	3	0	0	3	30	70
6	R18A1284	Mini Project	0	0	6	3	30	70
7	R18A1281	Data Warehousing and Data Mining Lab	0	0	3	1.5	30	70
8	R18A0590	Linux Programming 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 (IT) - ISemester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A1206	Programming for Application Development	3	0	0	3	30	70
2	R18A1207	Mobile Application Development	3	0	0	3	30	70
3	R18A0523	Cloud Computing	3	0	0	3	30	70
4	R18A1208	Business Data Analytics	3	0	0	3	30	70
6	R18A0526 R18A0531 R18A0522	Professional Elective 3: 1. MachineLearning 2. Internet ofThings 3. Software Testing Methodologies	3	0	0	3	30	70
6	R18A1282	Programming for Application Development Lab	0	0	3	1.5	30	70
7	R18A1283	Mobile Application Development Lab	0	0	3	1.5	30	70
8	R18A1285	Project-1	0	0	6	3	30	70
TOTAL			**15**	**0**	**12**	**21**	**240**	**560**

IV Year B.Tech (IT) - II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	MAX MARKS	
							INT	EXT
1	R18A1209	Tools and Techniques of Data Science	3	0	0	3	30	70
2	R18A0535 R18A1210 R18A0528	Professional Elective4: 1. ImageProcessing 2. Adhoc and Sensor Networks 3.Service Oriented Architecture	3	0	0	3	30	70
3	R18A1211 R18A0534 R18A1212	Professional Elective 5: 1. AdvancedDatabases 2. Block ChainTechnology 3. MiddlewareTechnologies	3	0	0	3	30	70
4	R18A1286	Project - 2	0	0	12	6	60	140
TOTAL			**09**	**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	R18A1251	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-IT **LT/P/DC**

2- / - / -2

(R18A0001) ENGLISH

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 designedsyllabus.
3. To familiarize students with the principles of writing to ensure error-freewriting.
4. To know to use sentence structure effectively and to understand how to convert ideas logically within asentence.
5. To expose students to various techniques of reading skills which hone their comprehensiveskills.

UNIT –I

Chapterentitled –**TheRoadNotTaken**‖byRobert Frost
Grammar –Tenses and Punctuation (Sequences of Tenses)
Vocabulary –Word Formation - Prefixes and Suffixes
Writing – Paragraph writing –I (Focusing on Tensesand Punctuations)Reading – Techniques for effective reading-Reading Exercise –Type1

UNIT – II

Chapterentitled –**AbrahamLincoln's Letter toHis Son's Teacher**‖Grammar – Voices, Transitive and Intransitive Verbs Vocabulary – Synonyms,Antonyms
Writing – E-mail Writing, Letter Writing (complaints, requisitions, apologies). Reading– Skimming, scanning- Reading Exercise –Type2

UNIT – III

Chapterentitled –**War**‖byL.Pirandello Grammar –Degrees of Comparison, Prepositions
Vocabulary – PhrasalVerbs
Writing – Essay Writing (Introduction, body and conclusion)Reading – Comprehension- Reading Exercise – Type3

UNIT – IV

Chapterentitled –**JKRowling'sHarvard Speech**‖ Grammar – Articles, Misplaced Modifiers Vocabulary – One-Word Substitutes
Writing – PrécisWriting
Reading – Intensive and Extensive reading - Reading Exercise – Type4

UNIT –V

Sentence Structures (phrases and clauses)

Grammar – Subject-Verb Agreement, Noun-Pronoun Agreement
Vocabulary – Commonly ConfusedWords
Writing – Memo Writing
Reading – Identifying Errors - Reading Exercise – Type 5

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

TEXT 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

REFERENCE BOOKS:

1. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press.2006.
2. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press.2011.
3. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford UniversityPress

OUTCOMES:

Students will be able to:

1. Write formal or informal letters and applications for differentpurposes.
2. Select and extract relevant information through skimming andscanning.
3. Utilize the strategy of brainstorming in preparing analytical, argumentative and expositoryessays.
4. Draft concise emails following professional emailetiquette.
5. Enhance their grammatical competency by spottingerrors.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH- I- YEAR- I- SEM–IT **L T/P/D C**

3 1/-/- 4

(R18A0021) MATHEMATICS -I

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 givenmatrix.
2. Finding maxima and minima of functions of severalvariables.
3. Applications of first order ordinary differential equations. (Newton‘s law of cooling, Natural growth anddecay)
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 LaplaceTransforms.

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 $f(x) = e^{ax}$, sinax, cosax, 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 (Heatequation).

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 functionswhen 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:

1. Higher Engineering Mathematics by B V Ramana ., Tata McGrawHill.
2. Higher Engineering Mathematics by B.S. Grewal, KhannaPublishers.
3. Advanced Engineering Mathematics by Kreyszig, John Wiley &Sons.

REFERENCE BOOKS:

1. Advanced Engineering Mathematics by R.K Jain & S R K Iyenger, NarosaPublishers.
2. Advanced Engineering Mathematics by Michael Green Berg, Pearson Publishers.
3. Engineering Mathematics by N.P Bali and ManishGoyal.

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 / withoutconstraints.
3. Solve first and higher order differentialequations.
4. Solve first order linear and non-linear partial differentialequations.
5. Solve differential equations with initial conditions using LaplaceTransform.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B.TECH – I YEAR – I SEM– IT **L T/P/DC**

3 -/-/- 3

(R18A0011) APPLIED PHYSICS

OBJECTIVES:

1. To understand dual nature of the matter and behavior of a particle quantummechanically.
2. To understand band structure of the solids and classification ofmaterials.
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 differentfields.
5. To be able to distinguish ordinary light with a laser light and realize the transfer of light through opticalfibers.

UNIT – I

QUANTUM MECHANICS

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

Free electron theory, Fermi level, Density of states, Periodic potential-Bloch‘s theorem, Kronig – Penny modal, 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

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, Solarcell.

UNIT-IV

DIELECTRICS AND MAGNETIC PROPERTIES OF MATERIALS

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

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:

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, Applicationsofoptical fibers.

TEXT BOOKS:

1. Engineering Physics by Arumugam, Anuradhapublications.
2. Engineering Physics- B.K.Pandey, S.Chaturvedi, CengageLearning.

REFERENCES:

1. Engineering Physics – R.K. Gaur and S.L.Gupta, Dhanpat RaiPublishers.
2. Engineering Physics, S Mani Naidu- PearsonPublishers.
3. Engineering physics 2nd edition –H.K.Malik and A.K.Singh.
4. Engineering Physics – P.K. Palaniswamy, Scitechpublications.
5. Physics by Resnick andHaliday.

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 electronicdevices.
3. Learn concentration estimation of charge carriers in semiconductors and working principles of PNdiode.
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 communicationsystems.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH – I- YEAR –ISEM-IT **L T/P/D**

C1 -/4-/- 3

(R18A0301) ENGINEERING GRAPHICS

Course Objectives:

1. Learn to sketch and take fielddimensions.
2. Learn to take data and transform it into graphicdrawings.
3. Learn basic engineering drawingformats

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 Methodonly)
b) Conic Sections (General Method only- EccentricityMethod)
c) Cycloid, Epicycloid andHypocycloid
d) Scales-Plain, Diagonal andVernier

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 conditionalproblems).

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

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 willincrease.
2. Students will be able to draw orthographic projections andsections.
3. Student‘s ability to perform basic sketching techniqueswillimprove.

TEXTBOOKS

1. Engineering Drawing, Special Edition-MRCET, McGrahill Publishers,2017.
2. Engineering Drawing, N.D.Bhatt
3. Engineering Drawing by K.Venu Gopal& V.Prabu Raja New AgePublications.

REFERENCES

1. Engineering drawing – P.J. Shah .S.ChandPublishers.
2. Engineering Drawing- Johle/Tata Macgraw Hill BookPublishers.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH – I- YEAR –ISEM-IT **L T/P/D C**

3 -/-/- 3

(R18A0501) PROGRAMMING FOR PROBLEM SOLVING

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 Publishers2017.
2. Computer Science: A Structured Programming Approach Using C, B.A.Forouzanand 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 EducationIndia.
5. Let us C ,Yashwanth Kanethkar, 13th Edition, BPBPublications.

OUTCOMES:

1. Demonstrate the basic knowledge of computer hardware andsoftware.
2. To formulate simple algorithms for arithmetic and logicalproblems.
3. To translate the algorithms to programs (in Clanguage).
4. To test and execute the programs and correct syntax and logicalerrors.
5. Ability to apply solving and logical skills to programming in C language and also in otherlanguages.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH – I- YEAR –ISEM-IT **L T/P/D C**

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(R18A0082) ENGINEERING WORKSHOP/ IT WORKSHOP

OBJECTIVES:

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

1. TRADES FOR EXERCISES:

At least two exercises from each trade:

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

2. TRADES FOR DEMONSTRATION &EXPOSURE:

1. Plumbing
2. MachineShop
3. Welding
4. Foundry
5. Metal Cutting (WaterPlasma)

TEXT BOOK:

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

OUTCOMES:

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

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B. TECH- I YEAR-ISEM-IT **L T/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 becovered.
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 beintroduced.
4. Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of officetools.
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 eachperipheral

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 amalfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to workingcondition.

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 accessthe

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/orworms.

MSOFFICE

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. Slidetransition
2. Master slideview
3. Insert picture – clipart, image
4. Actionbutton
5. Drawing tool bar – lines,arrows
6. Hyperlink

7. Custom animation
8. Hideslide
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

TEXT BOOKS:

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

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 devicedrivers.
2. Students can detect and perform minor hardware and software leveltroubleshooting.
3. The Students are capable of working on Internet & World Wide Web and can make effective usage of the internet foracademics.
4. The Students develop ability to prepare professional word documents, excel spread sheets and power point presentations using the Microsoft suite of officetools.
5. The students are able to create a static webpage‘s usingHTML.

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B. TECH- I YEAR-ISEM-IT

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(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 aprogram.
3. Role of constants, variables, identifiers, operators, type conversion and other building blocks of CLanguage.
4. Use of conditional expressions and looping statements to solve problems associated with conditions andrepetitions.
5. Role of Functions involving the idea ofmodularity.
6. Programming using gcc compiler inLinux.

Week 1:

a) Write a C program to find sum and average of threenumbers.
b) Write a C program to find the sum of individual digits of a given positiveinteger.

Week 2:

a) Write a C program to generate the first n terms of the Fibonaccisequence.
b) Write a C program to generate prime numbers from 1 ton.
c) Write a C program to check whether given number is Armstrong Number ornot.

Week 3:

a) Write a C program to check whether given number is perfect number ornot.
b) Write a C program to check whether given number is strong number ornot.

Week 4:

a) Write a C program to find the roots of a quadraticequation.
b) Write a C program to perform arithmetic operations using switchstatement.

Week 5:

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

Week 6:

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

Week 7:

a) Write a C program to find both the largest and smallest number in a list ofintegers.
b) Write a C program to Sort the Array in an AscendingOrder
c) Write a C program to find whether given matrix is symmetric ornot.

Week 8:

Revision of programs

Week 9:

a) Write a C program to perform addition of twomatrices.

b) Write a C program that uses functions to perform multiplication of twoMatrices.

Week 10:

a) Write a C program to use function to insert a sub-string in to given main string from a givenposition.

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 ornot.

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 containT.

Week 12:

a) Write C program to count the number of lines, words and characters in a giventext.

b) Write a C program to find the sum of integer array elements usingpointers.

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, BSPublications
2. Computer programming in C.V.RAjaraman, PHIPublishers.
3. C Programming, E.Balagurusamy, 3rd edition, TMHPublishers.
4. C Programming, M.V.S.S.N Venkateswarlu and E.V.Prasad,S.ChandPublishers
5. Mastering C,K.R.Venugopal and S.R.Prasad, TMHPublishers.

OUTCOMES:

1. Acquire knowledge about the basic concept of writing aprogram.
2. Understand the Role of constants, variables, identifiers, operators, type conversion and other building blocks of CLanguage.
3. Learn how to use of conditional expressions and looping statements to solve problems associated with conditions andrepetitions.
4. Understand the Role of Functions involving the idea ofmodularity.
5. Understand the Concept of Array and pointers dealing with memorymanagement.
6. Learn Structures and unions through which derived data types can beformed.

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B. TECH- I YEAR-ISEM-IT **L T/P/D C**

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(R18A0081) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

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 andrhythm.
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 appropriatetone.
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

CALLLab: 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.

OUTCOMES:

Students will be able to:

1. understand the importance of learningphonetics.
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.

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B. TECH- I YEAR-IISEM-IT **L T/P/D C 2 - / - / -2**

(R18A0002) PROFESSIONAL ENGLISH

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 interviewskills.
3. To lay foundation with writing strategies for the future workplaceneeds.
4. To acquaint students with different components of professional presentationskills.
5. To equip students with necessary training in listening to comprehend dialects of English language.

UNIT-I

Listening - Bill Gate‘s TED talk on Solving Big Problems
Speaking - Description of Pictures, Places, Objects and Persons
Grammar - Finite and Non-finiteverbs
Vocabulary - Business
VocabularyWriting -
ParagraphWriting

Unit –II

Listening - Google CEO Sundar Pichai‘s Speech I/O 2017
Keynote Speaking - Oralpresentations
Grammar - Transformation of Sentences
Vocabulary - Idioms
Writing - AbstractWriting

Unit –III

Listening - Sample Interviews
(videos) Speaking - Mock Interviews
Grammar - Direct and IndirectSpeech
Vocabulary - Standard Abbreviations (Mini
Project)Writing - Job applications I (CoverLetter)

Unit – IV

Listening - Telephonic Interviews
Speaking - Telephonic
ExpressionsGrammar - Auxiliary
verbs Vocabulary - WordAnalogy-I
Writing - Job Application II(Resume)

Unit – V

Listening - Tanmay Bhakshi‘s ITU
interview Speaking - ProfessionalEtiquette

Grammar - Common Errors
Vocabulary - Word Analogy-II
Writing - ReportWriting
* Exercises apart from the text book shall also be referred for classroom tasks.

TEXT 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

REFERENCE BOOKS:

1. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press.2006.
2. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press.2011.
3. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford UniversityPress

OUTCOMES:

Students will be able to:

1. draft coherent and unified paragraphs with adequate supportingdetails.
2. demonstrate problem solving skills, decision-making skills, analyticalskills.
3. comprehend and apply the pre-interview preparation techniques for successfulinterview.
4. achieve expertise in writing resume and cover letterformats.
5. understand the steps of writing _Reports andAbstract‘.

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B. TECH- I YEAR-IISEM-IT **L T/P/D C**

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(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 anequation.
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 $1/3^{rd}$ and Simpson‘s $3/8^{th}$ 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 theoerem-Green‘s Theorem, Stoke‘s theorem and Gauss‘s Divergence Theorems (Statement & their Verification).

TEXT BOOKS:

1. Higher Engineering Mathematics by B V Ramana ., Tata McGrawHill.
2. Higher Engineering Mathematics by B.S. Grewal, KhannaPublishers.
3. Mathematical Methods by S.R.K Iyenger, R.K.Jain, NarosaPublishers.

REFERENCE BOOKS:

1. Advanced Engineering Mathematics by Kreyszig, John Wiley &Sons.
2. Advanced Engineering Mathematics by Michael Greenberg –Pearsonpublishers.
3. Introductory Methods of Numerical Analysis by S.S. Sastry,PHI

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 discretedata.
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 decisionmaking.
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 integraltheorems.

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B.TECH- I- YEAR- II-SEM–IT	**L**	**T/P/DC**	
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(R18A0013) ENGINEERINGCHEMISTRY

OBJECTIVES:

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

UNIT-I:

Electrochemistry and Corrosion

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/electrolessplating.

UNIT -II:

Atomic and Molecular Structure

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

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 disinfectation-chlorination and ozonization; Desalination of water by Reverse Osmosis.

UNIT-IV:

Organic Reactions

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

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 anduses.

TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain & M. Jain, Dhanpat Rai Publishing Company (P) Ltd, 16thEdition, NewDelhi.
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, IVEdition.
2. Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publishing Company (P) Ltd, NewDelhi.
3. Reactions, Rearrangements and Reagents by S.N. Sanyal, Bharati BhavanPublishers.

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 engineeringservice.
2. Achieve basic concepts of atomic, molecular and electronic changes related to conductivity andmagnetism.
3. Familiarize the student with the fundamentals of the treatment technologies and the considerations for its design and implementation in water treatmentplants.
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 engineeringapplications.

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B.TECH- I- YEAR- II-SEM–IT **L T/P/DC**
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(R18A0502)OBJECT ORIENTEDPROGRAMMING

OBJECTIVES:

- To teach the student the concepts of object oriented and genericprogramming.
- To differentiate between object oriented programming and proceduralprogramming.
- To design applications using object orientedfeatures.
- To teach the student to implement object orientedconcepts.

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.
Exceptionhandling:
Basics of Exception Handling, Types of exceptions, Exception Handing Mechanism, Throwing and CatchingMechanism.

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++ byBalaguruswamy
2. C++, the Complete Reference, 4th Edition, HerbertSchildt,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.

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B.TECH- I- YEAR- II-SEM–IT **L T/P/DC**

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(R18A0201) BASIC ELECTRICALENGINEERING

OBJECTIVES:

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 electricalcircuits.
3. Analysis of Circuits Which Includes Network Analysis & NetworkTheorems.
4. Analysis of Single Phase AC Circuits, Magnetic Circuits and Basic Treatment of Single Phase Transformers and DC Machines isintroduced.

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 treatmentonly):

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, torqueequation.

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, KhannaPublishers.

REFERENCE BOOKS:

1. Network analysis by M.E Van Valkenburg, PHI learningpublications.
2. Network analysis - N.C Jagan and C. Lakhminarayana, BSpublications.
3. Electrical Circuits by A. Sudhakar, Shyammohan and S Palli, Mc Graw HillCompanies.
4. Electrical Machines by I.J. Nagrath & D. P. Kothari, Tata Mc Graw-HillPublishers.

OUTCOMES:

At the end of this course the student would get

1. A thorough knowledge of the basic RLC circuitelements
2. Understanding of the basic concepts of networks and circuits withRLC
3. Concepts of single phase ACcircuits
4. Network theorems and their application to solve problems in Networkanalysis
5. Fundamentals Of Constructional Details And Principle Of Operation Of DC Machines AndTransformers

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.TECH- I YEAR – II- SEM–IT **L T/P/DC**

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(R18A0083) ENGINEERING PHYSICS/ CHEMISTRYLAB

(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 andelectronics.
3. The students are thoroughly trained in learning practical skills by completing all the experiments in physicslab.

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 givenwire.
2. Melde‘s experiment –Transverse and Longitudinalmodes.
3. Stewart and Gee‘s method- Magnetic field along the axis of current carryingcoil.
4. Spectrometer-Dispersive power of the material of aprism
5. Diffraction grating-using laser -Wave length oflight.
6. Newton‘s Rings –Radius of curvature of Plano convexlens.
7. C-R circuit – Time Constant of RCcircuit
8. Characteristics ofLED.
9. Characteristics of a Solarcell.
10. Evaluation of numerical aperture of opticalfiber.

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 engineeringphysics.
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 determinedexperimentally.
4. Opto electronic devices and their working are practically realized by the students. In addition the functioning of optical fiber is practicallystudied.
5. The students learn experimental skills to design new experiments suitable for requirements in different fields(industrial, medical, scientific fieldsetc.)

MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY
(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 expectedto

1. Provide the students with a solid foundation in chemistry laboratory required to solve engineeringproblems.
2. Practical implementation of fundamentalconcepts.
3. The students are thoroughly trained in learning practical skills by completing all the experiments in chemistrylab.

List of
Experiments

Titrimetry:

1. Estimation of hardness of water by EDTAmethod.

Instrumental Methods:

Colorimetry:

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

Conductometry:

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

Potentiometry:

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

Preparation:

8. Preparation ofAspirin.

Physical properties:

9. Determination of Viscosity of sample oil by RedwoodViscometer.
10. Determination of Surface Tension of a given liquid byStalagmometer.

TEXT BOOK:

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

REFERENCE BOOKS:

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

OUTCOMES:

At the end of the course students will be able to

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

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B.TECH- I YEAR – II- SEM–IT **LT/P/DC**

-/3/- 1.5

(R18A0582) OBJECT ORIENTED PROGRAMMING LAB

OBJECTIVES:

1. To strengthen problem solving ability by using the characteristics of an object-orientedapproach.
2. To design applications using object orientedfeatures
3. To handle Exceptions inprograms.
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 positiveinteger.
b) Write a C++ program to generate the first n terms of thesequence.

Week 3:

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

Week 4:

a) Write a C++ program to sort a list of numbers in ascendingorder.
b) Write a Program to illustrate New and Delete Keywords for dynamic memoryallocation

Week 5

a) Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
b) Program to illustrate default constructor, parameterized constructor and copyconstructors
c) Write a Program to Implement a Class STUDENT having FollowingMembers:

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:

a) Write a Program to Demonstrate the i)Operator Overloading.ii) FunctionOverloading.
b) Write a Program to Demonstrate Friend Function and FriendClass.

Week 7:

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

Week 8:

Revision laboratory

Week 9

Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
a) Reading a matrix. b) Addition of matrices. c) Printing a matrix.
d) Subtraction of matrices. e) Multiplication of matrices

Week 10

Write C++ programs that illustrate how the following forms of inheritance are supported:
a)Singleinheritance b)Multiple inheritance c)Multi levelinheritance 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 ofElements.
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 ascendingorder.

Week 13

a) Write a Program Containing a Possible Exception. Use a Try Block to Throw it and a Catch Block to Handle itProperly.
b) Write a Program to Demonstrate the Catching of AllExceptions.

Week14

Revision

TEXT BOOKS:

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

REFERENCE BOOKS:

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

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B.TECH- I YEAR – II- SEM-IT **L T/P/DC**

- -/3/- 1.5

(R18A0281) BASIC ELECTRICAL ENGINEERINGLAB

OBJECTIVES:

To Design Electrical Systems.

1. To Analyze A Given Network By Applying Various NetworkTheorems.
2. To Expose The Students To The Operation Of DCGenerator
3. To Expose The Students To The Operation Of DC Motor andTransformer.
4. To Examine The Self Excitation In DCGenerators.

CYCLE –I

1. Verification of KVL andKCL.
2. Verification of Thevenin'stheorem.
3. Verification of Norton'stheorem.
4. Verification of Superpositiontheorem.
5. Verification of Maximum power transfertheorem.
6. Verification of Reciprocitytheorem.

CYCLE-II

7. Magnetization characteristics of DC shuntgenerator.
8. Swinburne's test on DC shuntmachine.
9. Brake test on DC shuntmotor.
10. OC & SC tests on single phasetransformer.
11. Load test on single phasetransformer.

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 DCMachines
3. Acknowledge the principles of operation and the main features of electric machines and theirapplications.
4. Acquire skills in using electrical measuringdevices.

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B.TECH- I YEAR – II- SEM–IT **L T/P/DC**

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(R18A0003) HUMAN VALUES AND SOCIETAL PERSPECTIVE

(Mandatory Course)

OBJECTIVES:

This introductory course input is intended:

1. to help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all humanbeings.
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 naturalway.
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 withNature.

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 (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha) - from family to world family!

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 professionalethics:

a. Ability to utilize the professional competence for augmenting universal humanorder.
b. Ability to identify the scope and characteristics of people-friendly and eco-friendly productionsystems.
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 ProfessionalEthics.
2. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rdEdition.

REFERENCEBOOKS:

1. Ivan IIIich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins,USA
2. E. F. Schumancher, 1973, Small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.
3. A Nagraj, 1998 Jeevan Vidya ek Parichay, Divya Path 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, CommonwealthPublishers.
6. A. N. Tripathy, 2003, Human Values, New Age InternationalPublishers.
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, UniverseBooks.
9. E G Seebauer & Robert L.Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford UniversityPress.

10. M Govindrajan, S Natrajan & V. S Senthil kumar, Engineering Ethics (including Humna Values), Eastern Economy Edition, Prentice Hall of IndiaLtd.

Relevant CDs, Movies, Documentaries & Other Literature:

1. Value Education website,http://www.uptu.ac.in
2. Story of Stuff,http://www.storyofstuff.com
3. AI Gore, An Inconvenient Truth, Paramount Classics,USA
4. Charle Chaplin, Modern Times, United Artists,USA
5. IIT Delhi, Modern Technology - the UntoldStory

OUTCOMES:

1. The students will be able to obtain happiness and prosperity in theirlife.
2. They will develop harmony at alllevels.

They can have satisfying human behavior throughout their life.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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II Year B.Tech IT-ISem 3 -/-/-3

(R18A1201) COMPUTER ORGANIZATION ANDARCHITECTURE

OBJECTIVES:

The students will be exposed:

1. To how the Computer Systems work and its basicprinciples
2. To Instruction Level Architecture and Instruction Execution and memory system design
3. To how the I/O devices are accessed and itsprinciples.
4. To Instruction Level Parallelism and knowledge on microprogramming
5. To the concepts of advanced pipeliningtechniques.

UNIT - I:

Functional blocks of a computer: CPU, memory, input-output subsystems, control unit. Computer Organization and Architecture - Von Neumann

Data representation: signed number representation, fixed and floating point Representations, Character representation. Computer arithmetic – integer addition and Subtraction, Ripple carry adder, carry look-ahead adder, etc. Multiplication – shift-and add, Booth multiplier, Carry save multiplier, etc. Division restoring and non-restoring techniques, Floating point arithmetic.

UNIT – II:

Introduction to x86 architecture.

Instruction set architecture of a CPU: Registers, instruction execution cycle, RTL Interpretation of instructions, addressing modes, instruction set.

CPU Control unit design: Hardwired and micro-programmed design approaches

UNIT – III:

Memory system design: Semiconductor memory technologies, memory organization.

Memory organization: Memory interleaving, concept of hierarchical memory organization, Cache memory, cache size vs. block size, mapping functions, Replacement algorithms, write policies.

UNIT – IV:

Peripheral devices and their characteristics: Input-output subsystems, I/O device interface, I/O transfers – program controlled, interrupt driven and DMA, privileged and non-privileged instructions, software interrupts and exceptions. Programs and processes – role of interrupts in process state transitions, I/O device interfaces – SCII, USB

UNIT – V:

Pipelining: Basic concepts of pipelining, throughput and speedup, pipeline hazards.**Parallel Processors**: Introduction to parallel processors, Concurrent access to memory and cachecoherency.

TEXTBOOKS:

1. **"**Computer Organization and Design: The Hardware/Software Interface‖, 5th Edition by David A. Patterson and John L. Hennessy,Elsevier.
2. –ComputerOrganization and Embedded Systems‖,6th Editionby CarlHamacher,McGraw Hill Higher Education.

REFERENCE BOOKS:

1. –ComputerArchitectureand Organization‖, 3rdEdition byJohn P. Hayes,WCB/McGraw-Hill
2. –ComputerOrganization and Architecture: DesigningforPerformance‖, 10th Editionby William Stallings, PearsonEducation.
3. –ComputerSystem Design and Architecture‖, 2ndEdition byVincentP.HeuringandHarry F. Jordan, Pearson Education.

Course Outcomes :

1. Draw the functional block diagram of a single bus architecture of a computer and describe the function of the instruction execution cycle, RTL interpretation of instructions, addressing modes, instructionset.
2. Write assembly language program for specified microprocessor for computing16 bit multiplication, division and I/O device interface (ADC, Control circuit, serial port communication).
3. Write a flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe theprocess.
4. Given a CPU organization and instruction, design a memory module and analyze its operation by interfacing with theCPU.
5. Given a CPU organization, assess its performance, and apply design techniques to enhance performance using pipelining, parallelism and RISCmethodolog

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II Year B.Tech IT -ISem 3-/-/-3

(R18A0503) DATA STRUCTURES

Prerequisites: Acourseon–Programming forProblem Solving‖.

Course Objectives:

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

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 Publishers2017.

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 andSons.

2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., SecondEdition

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 toassess efficiency trade-offs among different data structure implementationsof

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.

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II Year B.Tech IT-ISem	**3**	**-/-/- 3**

(R18A0504) OPERATING SYSTEMS

OBJECTIVES:

- To learn the fundamentals of OperatingSystems.
- To learn the mechanisms of OS to handle processes and threads and their communication
- To learn the mechanisms involved in memory management in contemporaryOS
- To gain knowledge on distributed operating system concepts that includes architecture,
- Mutual exclusion algorithms, deadlock detection algorithms and agreementprotocols
- To know the components and management aspects of concurrencymanagement

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, Dinning Philosopher Problemetc.

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 ofpaging.

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 andperformance.

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 StudentEdition.
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-Hallof India
4. Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly andAssociates

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 CPUutilization, 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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II Year B.Tech IT-ISem	**3**	**-/-/-**	**3**

(R18A506) DISCRETEMATHEMATICS

OBJECTIVES:

The course should enable the students to:

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

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 theoremproving.

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. JoeL.Mott,AbrahamKandel,TheodoreP.Baker,—DiscreteMathematicsforComputerScientists 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, NewDelhi, 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
4. Introduction , Pearson Education, India, 5th Edition,2011.
5. 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 algebraicstructure
- 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.

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II Year B.Tech IT-ISem	**3**	**-/-/-**	**3**

(R18A0024) PROBABILTY AND STATISTICS

OBJECTIVES:

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

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 andvariance.

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 ChandPublishers.
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.KrishnaGandhi ,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 continuoustype.
- Provide very good insight which is essential for industrial applications by learning probabilitydistributions.
- Make data-driven decisions by using correlation andregression.
- 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 experimentaldata.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

	L	T/P/D	C
II Year B.Tech IT-ISem	**3**	**-/-/-**	**3**

(R18A0461) ANALOG & DIGITALELECTRONICS

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 logicalgates.
- To introduce the methods for simplifyingBooleanexpressions
- To outline the formal procedures for the analysis and design of combinational circuits and sequentialcircuits

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 subtract or, 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 –ElectronicDevices&Circuits‖, Special Edition–MRCET,McGrawHill Publications, 2017.

2 Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGrawHill.

3 Electronic Devices and Circuits, S.Salivahanan, N.Suresh kumar, McGrawHill.

4 M.MorrisMano,DigitalDesign,3rdEdition,PrenticeHallofIndiaPvt.Ltd.,2003 /Pearson Education

(Singapore) Pvt. Ltd., New Delhi, 2003.

5 Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge.

REFERENCE BOOKS:

1. Electronic Devices and Circuits,K.Lal Kishore B.SPublications

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:

1. Understand and Analyze the PN and Zener diodes, operation and itscharacteristics
2. Understand and analyze the BJTTransistor.
3. Understand the basic postulates of Boolean algebra and shows the correlation between Booleanexpressions
4. Learn the methods for simplifying Booleanexpressions
5. Understand the formal procedures for the analysis and design of combinational circuits and sequentialcircuits

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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II Year B.Tech IT-ISem - -/3/- 1.5

(R18A0583) OPERATING SYSTEMS LAB

OBJECTIVES:

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

Week 1: Simulate the following CPU scheduling algorithms.
Round Robin b) SJF c) FCFS d) Priority.

Week 2: Simulate all file allocation strategies
Sequential b)Indexed c)
Linked.

Week 3: Simulate MVT and MFT.

Week 4: Write a 0C program to simulate the following contiguous memory allocation techniques a) Worst fit b)Bestfit c) First fit.

Week 5: Simulate all File Organization Techniques
Singleleveldirectory b)Twolevel c) Hierarchical d)DAG.

Week 6: Simulate Bankers Algorithm for Dead Lock Avoidance.

Week 7: Simulate Bankers Algorithm for Dead Lock Prevention.

Week 8: Write a C program to simulate disk scheduling

algorithms.
a)FCFS b)SCAN c)C-SCAN

Week 9: Simulate all page replacement algorithms
a)FIFO b)LRU c)LFU

Week 10: Simulate Paging Technique of memory management.

Week 11: Write a C program to simulate producer-consumer problem using semaphores.

Week 12: Write a C program to simulate the concept of Dining-philosophers problem.

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 inter process communication between twoprocesses.
- Ability to design and solve synchronizationproblems.
- Ability to simulate and implement operating system concepts such as scheduling, Deadlock management, file management, and memorymanagement.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

L T/P/ C

II Year B.Tech IT-ISem - /3/1.5

(R18A0584) DATA STRUCTURESLAB

OBJECTIVES:

- To make the student learn a object oriented way of solvingproblems.
- To make the student write ADTS for all datastructures.

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) Linkedlist(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 use both recursive and non recursive functions to perform thefollowing searching operations for a Key value in a given list of integers:

a) Linearsearch
b) Binarysearch.

Week 7.

Write a program that implements the following sorting

1. Bubblesort
2. Selection sort
3. Quicksort.

Week 8.

Write a program that implements the following

1. Insertion sort
2. Mergesort
3. 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 searchtree.
b) Delete an element from a binary searchtree.
c) Search for a key element in a binary searchtree.

Week 11.

Write a program to implement the tree traversal methods.

Week 12.

Write a program to perform the followingoperations:

a) Insert an element into a AVLtree.
b) Delete an element from a AVLtree.
c) Search for a key element in a AVLtree.

TEXTBOOKS:

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 implementit.
- 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 computationcomplexity.
- Student will able to write program for Selection Sort, Bubble Sort, InsertionSort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.

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II Year B.Tech IT-ISem	**2**	**-/-/- -**

(R18A0004) FOREIGNLANGUAGES-FRENCH

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 Frenchlanguage.
2. To hone the basic sentence constructions in day to day expressions for communication in theirvocation.
3. To culminate their major with evidence of a purposefuleducation.

UNIT - I:

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

Writing: Understand and fill out a form

Grammar: Theverbs–to be'and–to have"in thepresent tenseoftheindicative

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 theshops

Writing: A dialogue between a vendor and a customer at themarket

Grammar: Verbs–to want‖,–to can‖ - Express capacity / possibility - Expresswill / 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 thepresent

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 BellRochester
4. Ultimate French Beginner-Intermediate (Coursebook) By LividLanguage
5. Ã 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 A1level.
2. The student will have an advantage in the competitive jobmarket.
3. This course benefits the graduates when pursuing study opportunities in the countries where French is the officiallanguage.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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IIYearB.TechIT-IISem **3 -/-/-3**

(R18A0511) SOFTWAREENGINEERING

Objectives:

The students will be able :

1. To comprehend the various software processmodels.
2. To understand the types of software requirements and SRSdocument.
3. To know the different software design and architecturalstyles.
4. To learn the software testing approaches and metrics used in softwaredevelopment.
5. To know about quality control and riskmanagement.

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 andTools

UNIT - II:

SoftwareRequirements: Functionaland non-functionalrequirements, User requirements, System requirements, Interface specification, the software requirementsdocument.

Requirements engineering process: Feasibility studies,Requirementselicitation and analysis, Requirements validation, Requirementsmanagement.

System models: Context Models, Behavioralmodels,Datamodels, Object models,structuredmethods. UMLDiagrams.

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 Userinterfacedesign: Golden rules, User interface analysis and design, interface analysis, interface design steps, Designevaluation.

UNIT -IV:

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

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

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

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 qualitystandards.

TEXT BOOKS :

1. Software Engineering A practitioner‘s Approach, Roger SPressman,6th edition. McGraw Hill InternationalEdition.
2. Software Engineering, Ian Sommerville, 7th edition, Pearsoneducation.

REFERENCE BOOKS :

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India,2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill,2008
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford UniversityPress.
4. Software Engineering1: Abstraction and modelling, Diner Bjorner, Springer International edition, 2006.
5. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition2006.
6. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & SonsLtd.
7. Software Engineering3: Domains, Requirements, and Software Design, D. Bjorner, Springer InternationalEdition.
8. Introduction to Software Engineering, R. J. Leach, CRCPress.

Course Outcomes:

Students will have the ability:

1. To compare and select a process model for a businesssystem.
2. To identify and specify the requirements for the development of anapplication.
3. To develop and maintain efficient, reliable and cost effective softwaresolutions.
4. To critically think and evaluate assumptions and arguments of theclient.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

L T/P/DC

IIYearB.TechIT-IISem **3 -/-/-3**

(R18A1202)AUTOMATA AND COMPILER DESIGN

OBJECTIVES:

- To provide an understanding of automata ,grammars, languagetranslators.
- Toknowthevarioustechniquesusedincompilerconstruction
- Tobeawareoftheprocessofsemanticanalysis.
- To analyze the code optimization & codegeneration techniques.

UNIT - I:

Formal Language and Regular Expressions: Languages, Definition Languages regular expressions, Finite Automata

– DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Context Free grammars and parsing, derivation, parse trees, Application of FiniteAutomata.

UNIT - II:

Introduction To Compiler, Phases of Compilation, ambiguity LL(K) grammars and LL(1) parsing Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

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

UNIT - III:

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

UNIT - IV:

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

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

UNIT - V:

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

TEXT BOOKS:

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

COURSE OUTCOMES:

- Understand the necessity and types of different language translatorsinuse.
- Apply the techniques and design different components (phases)of acompiler.
- Abilityto implement practical aspects of automatatheory.
- UsethetoolsLex,Yaccincompilerconstruction.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IIYearB.TechIT-IISem **L T/P/DC**
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 bedeveloped.
- 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 abstractclasses.
- To understand the implementation of packages andinterfaces.
- To understand the concepts of exception handling, multithreading and collectionclasses.
- To understand how to connect to the database using JDBC.
- To understand the design of Graphical User Interface using applets and swingcontrols.

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. JavaFundamentals–AComprehensiveIntroduction,HerbertSchildtandDaleSkrien,TMH.
2. Core Java: An Integrated Approach – Dr R NageswaraRao

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. ObjectOrientedProgrammingthroughJava,P.RadhaKrishna,UniversitiesPress.
3. Thinking in Java, Bruce Eckel,PE
4. Programming in Java, S. Malhotra and S. Choudhary, Oxford UniversitiesPress.
5. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and JohnVlissides.

Outcomes:

- An understanding of the principles and practice of object oriented analysis and design intheconstructionofrobust,maintainableprogramswhichsatisfytheirrequirements;
- Acompetencetodesign,write,compile,testandexecutestraightforwardprograms using a high levellanguage;
- An appreciation of the principles of object orientedprogramming;
- Anawarenessoftheneedforaprofessionalapproachtodesignandtheimportanceof good documentation to the finishedprograms.
- Beabletoimplement,compile,testandrunJavaprogramscomprisingmorethanone class, to address a particular software problem.
- DemonstratetheabilitytousesimpledatastructureslikearraysinaJavaprogram.
- BeabletomakeuseofmembersofclassesfoundintheJavaAPI(suchastheMathclass).
- 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 ofrequirements.
- Able to develop applications using Applet, AWT, JDBC andSwings

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech IT -IISem **L T/P/D C**

3 -/-/-3

(R18A0510) DATABASE MANAGEMENT SYSTEMS

OBJECTIVES:

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

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 QueryProcessor.

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, RelationalOperations.

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 – GROUPBY – 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.

TEXT BOOKS:

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

REFERENCE BOOKS:

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

Outcomes:

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IIYearB.TechIT-IISem **L T/P/D C**
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 decisionmaking.
- 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 andsupply.
- To estimate cost and understand market structure, pricingpractices.
- To interpret the financial results of theorganisation.

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, VikasPublications.
- 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, VikasPublications.
- M. Y. Khan and P. K. Jain, Financial Management, McGrawHill

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

L T/P/DC

II Year B.Tech IT-IISem --/2/-0

(R18A0014) ENVIRONMENTAL SCIENCES (Mandatory Course)

Objectives:

1. To understand the importance of ecological balance for sustainabledevelopment
2. To know the importance of Naturalresources
3. To understand the impacts of developmental activities and mitigation measures for recognizing each and every action of us, reflects on the environment andviceversa.
4. To know the significance of wastemanagement

UNIT I- ENVIRONMENTAL EDUCATION AND ECOSYSTEMS [6 periods]

Environmental education: Definition and objective. 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-NATURALRESOURCES [6 periods]

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 [10 periods]

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-WASTEMANAGEMENT [6 periods]

Sources, effects and control of solid 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 [6 periods]

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.

SUGGESTED 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 UniversityPress.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. NewDelhi.
2. Environmental Engineering and science by Gilbert M.Masters and Wendell P. Ela .2008 PHILearning Pvt. Ltd.
3. Environmental Science by Daniel B.Botkin & Edward A.Keller, Wiley INDIAedition.
4. Principles of Environmental Science by William . P. Cunnningham & Mary Inn CunnninghamTata McGRAW –Hill Publishing Company Ltd.
5. Environmental Studies by S. Rama Lakshmi & Purnima Smarath KalyaniPublishers.

Course Outcomes:

1. Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of Ecological principles and environmental regulations which in turn will help in sustainabledevelopment
2. This course will sensitise the students through activities assigned to them after every unit
3. This course will help the students understand the complex relationships between natural and humansystems

OPENELECTIVE-I

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

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II Year B.Tech IT-II Sem **3-/-/-3**

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 Booleanexpressions.
2. To introduce the methods for simplifying Booleanexpressions.
3. To outline the formal procedures for the analysis and design of combinational and sequentialcircuits.
4. To introduce the concept of memories and programmable logicdevices.
5. To illustrate the concept of synchronous and asynchronous sequentialcircuits.

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 suing ROM, PLA, PAL.

TEXT BOOK:

1. MMorrisMano, ‐DigitalDesign‖, 4thEdition, PrenticeHall ofIndiaPVt.,Ltd., 2008/Pearson Education (Singapore) Pvt., Ltd., New Delhi,2003.
2. DonaldPLeachandAlbertPaulMalvino,―DigitalPrinciplesandApplications‖, 6th Edition, TMH,2006.

REFERENCES:

1. John FWakerly.‐DigitalDesign,Fourth Edition,Pearson/PHI,2008
2. John MYarbrough,‐DigitalLogic Applicationsand Design‖, ThomsonLearning, 2006
3. CharlesHRoth,‐Fundamentals ofLogicDesign‖, 6thEdition, ThomsonLearning,2013
4. ThomasLFloyd,‐Digital Fundamentals‖,10thEdition,Pearson EducationInc,2011.
5. Donald DGivone, ‐Digital Principlesand 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 Booleanexpressions
2) Design and implement Combinational and Sequentialcircuits.
3) Design and implement Synchronous and Asynchronous SequentialCircuits

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.TechIISem **L T/P/DC**

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 and BCNF-Decompositions and desirable properties -

UNIT V:

Transactions: Transaction concept, transaction state, System log, Commit point, Desirable Properties of a Transaction, concurrent executions, serializability, recoverability, implementation of isolation, transaction definition in SQL, Testing for serializability**,**

Serializability by Locks-Locking Systems with Several Lock Modes-Concurrency Control by Timestamps, validation.

TEXT BOOK:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan,‖ Database System Concepts‖, McGraw-Hill, 6th Edition ,2010.

2. Fundamental of Database Systems, by Elmasri, Navathe, Somayajulu, and Gupta, Pearson Education.

REFERENCES:

1. Raghu Ramakrishnan, JohannesGehrke,–DatabaseManagement System‖,McGrawHill., 3rd Edition2007.

2. Elmasri & Navathe,‖ Fundamentals of Database System,‖ Addison-Wesley Publishing, 5th Edition,2008.

3. Date.C.J, –AnIntroduction to Database‖, Addison-WesleyPub Co, 8th Edition,2006.

4. Peterrob, Carlos Coronel,–DatabaseSystems–Design,Implementation, and Management‖, 9th Edition, Thomson Learning,2009.

OUTCOMES

1. Demonstrate the basic elements of a relational database managementsystem
2. Ability to identify the data models for relevantproblems
3. Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respectdata

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech. II Sem

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3	-/-/-	3

OPEN ELECTIVE I
(R18A0553) DATA STRUCTURES USING PYTHON

OBJECTIVES:

1) To read and write simple Pythonprograms.
2) To develop Python programs with conditionals and loops.
3) To define Python functions and callthem.
4) To use Python data structures –- lists, tuples,dictionaries.
5) To do input/output with files inPython.

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 Lamda function in python.

UNIT IV

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

UNIT V

Sorting: BubbleSort,SelectionSort,InsertionSort,Mergesort,Quicksort.LinkedLists,Stacks,Queues

OUTCOMES:

Upon completion of the course, students will be able to

1) Read, write, execute by hand simple Pythonprograms.
2) Structure simple Python programs for solvingproblems.
3) Decompose a Python program intofunctions.
4) Represent compound data using Python lists, tuples,dictionaries.
5) Read and write data from/to files in PythonPrograms

TEXT BOOKS

1) AllenB.Downey,``ThinkPython:HowtoThinkLikeaComputerScientist__,2nd edition, Updated for Python 3, Shroff/O_Reilly Publishers,2016.
2) R. NageswaraRao,-CorePython Programming‖, dreamtech
3) Python Programming: A Modern Approach, Vamsi Kurama,Pearson

REFERENCE BOOKS:

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.TechIISem **LT/P/C**

3 -/-/- 3

OPEN ELECTIVE - I
(R18A0351) INTELLECTUAL PROPERTY RIGHTS

OBJECTIVES:

- To create an understanding on Intellectual Properties and the importance ofit.
- To acquire knowledge on Trademarks, Trade secrets & unfair completionmethods.
- To create awareness on the protection of copyrights andpatents.
- To attain basic understanding of Cyber laws, Cyber Crime and get an understanding of Privacy ofData.
- To gain knowledge on international aspects and the Emerging Trends inIPR.

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 SpecialTopicscollections.
3. R. RadhaKrishnan,S. Balasubramanian:-Intellectual PropertyRights‖,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 – NewDelhi.
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 rightsetc.,
2. Gain knowledge on Trademarks and TradeSecrets.
3. Brings awareness on the various types of Unfair Competition and gets well versed with exposure to licensing and transfer of Copyrights andPatents
4. Attain awareness of Cyber laws and Cyber Crime, to protect the data fromCybercrime.
5. Comprehend emerging trends in IPRglobally.

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II Year B.TechIISem **L T/P/D C**

3 -/-/- 3

OPEN ELECTIVE - I
(R18A0352) GREEN ENERGY SYSTEMS

OBJECTIVES:

1. The course aims to highlight the significance of alternative sources ofenergy.
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.
3.

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 titled 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 andpumps.

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 Collectionand 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, Springer2013.

REFERENCES:

1. Alternative Building Materials and Technologies / K.S Jagadeesh, B.VVenkata Rama Reddy and K.S NanjundaRa.
2. Principles of Solar Energy / Frank Krieth & John FKreider.
3. Non-Conventional Energy / Ashok V Desai /WileyEastern.
4. Renewable Energy Technologies /Ramesh & Kumar/Narosa
5. Renewable Energy Technologies/ G.DRoy
6.

COURSE OUTCOMES:

1. The student shall understand the principles and working of solar, wind, biomass, geo-thermal, oceanenergies.
2. Green energy systems and appreciate their significance in view of their importancein the current scenario and their potential futureapplication.

IIYearB.Tech.IISem **L T/P/D C**
3 -/-/- 3

OPEN ELECTIVE I

(R18A0555) DATA VISUALIZATION

Course Objectives:

- To learn different statistical methods for Datavisualization.
- To understand the basics of R andPython.
- To learn usage of Watsonstudio.
- To understand the usage of the packages likeNumpy, pandas andmatplotlib.
- To know the functionalities and usages ofSeaborn.

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 / Joindatasets

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, DreamtechPress.
2. Hands on programming with R by Garrett Grolemund,Shroff/O'Reilly; Firstedition
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 Datavisualization.
- Gain knowledge on R andPython
- Understand usage of various packages in R and Python.
- Demonstrate knowledge of Watsonstudio.
- Apply data visualization tools on various datasets.

II Year B.Tech IT-IISem --/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 rigorouseducation.
- 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.

Week 1: A) Write a java program to find the Fibonacci series using recursive and non recursive functions.

B) Write a java program to multiply two givenmatrices.

Week2: A) Write a java program for Method overloading and Constructoroverloading.

B) Write a java program to display the employee details using Scannerclass.

C) Write a java program that checks whether a given string is palindrome ornot.

Week 3: A) Write a java program to represent Abstract class with example.

B) Write a java program to implement Interface using extends keyword.

Week 4: Write a java program to create user defined package.

Week 5: A) Write a java program to create inner classes.

B) Write a java program for creating multiple catch blocks.

Week 6: A) Write a java program for producer and consumer problem using Threads.

B) WriteaJavaprogramthatimplementsamulti-threadapplicationthathasthree threads.

Week 7: A) Write a java program to display File class properties.

B) Write a java program to represent ArrayListclass.

Week 8: Write a Java program loads phone no, name from a text file using hash table.

Week 9: Write an applet program that displays a simple message.

A) Write a Java program compute factorial value usingApplet.

B) Write a program for passing parameters usingApplet.

Week 10: Write a java program for handling Mouse events and Key events

Week11: A) Write a java program that connects to a database usingJDBC
B) Write a java program to connect to database using JDBC &insert valuesinto table
C) Write a java program to connect to a database using JDBC and delete values fromtable.

Week 12: 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 andDale Skrien,TMH.

REFERENCE BOOKS:

2. 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 inOOP.
- Demonstrate an ability to design and develop java programs, analyze, and interpret object oriented data and reportresults.
- Demonstrate an ability to design an object oriented system, AWT components or multithreaded process as per needs andspecifications.
- 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 AND TECHNOLOGY

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II Year B.Tech IT-IISem - -/3/- 1.5

(R18A0586) DATABASE MANAGEMENT SYSTEMSLAB

Objectives:

1. To familiarize database design concepts using ER modeling and Relational model.
2. To enable students to use SQL to query database and perform all types of operations and understanding normalization and effective database design principles
3. To enable students to use Non-Relational DBMS and understand the usage of Document oriented and distributed databases.
4. To enable the students to use TCL and DCL Commands and perform all states of Transaction operations

A. **Practice on SQL Queries to acquire knowledge onRDBMS.**

B. **CaseStudy:**

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, develop ing 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 andTicketing
- 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 Entitites and Relationships, 2.E-R Model, 3.Relational Model 4.Normalization 5.Creating the database 6.Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc. Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example:

Entities:

1. B US
2. Ticket
3. Passenger

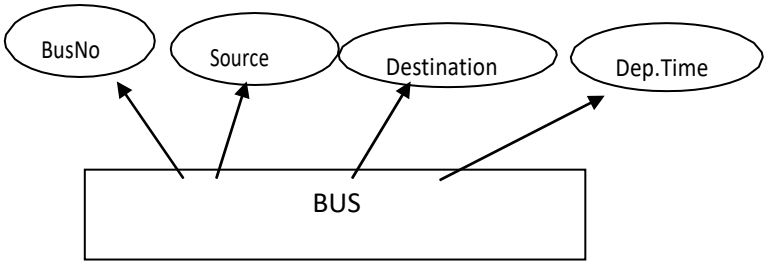
Relationships:

1. Reservation
2. Cancellation

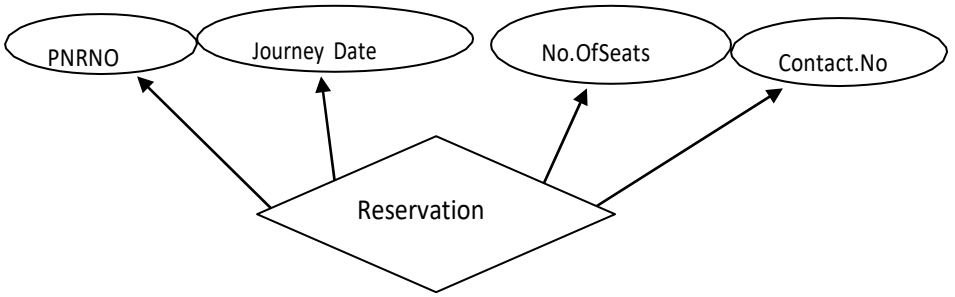
PRIMARY KEY ATTRIBUTES:

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

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



Ex: BusEntity



Ex: Reservation relationship

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

Experiment 2: Concept design with E-R Model Note: -

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

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

Experiment 3: Relational Model

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

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

Example: The passenger looks as below .This is an example. You can add more attributes based on your E-R-Model

This is not normalizedtable.

Passenger Name Age Sex Address

Ticket_id PassportID

Note:Thestudentisrequiredtosubmitadocumentbyrepresentrelationshipsina tabularfashion to the lab teacher.

Experiment 4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain typesof 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 PassportID

Passport_id Ticket_id

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

Experiment5:InstallationofMysql/MongoDB/NoSQLandpracticingDDL,commands

Installation of MySql / MongoDB / NoSQL . 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 commandsetc.

5.a) 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) NotNULL);

Similarly create all other tables.

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

5.b) Installation of MongoDB

Installation of MongoDB on Windows, MongoDB is a cross-platform, document oriented database that provides, high performance, high availability, and easy scalability. MongoDB works on concept of collection and document. In this week You will Learn with MongoDB. How to create Database, Collection, Document, Field, Embedded Documents. Relationships in MongoDB represent how various documents are logically related to each other. Relationships can be modeled via**Embedded** and **Referenced**approaches.

Eg: MongoDB **db.createCollection(name, options)** is used to create collection.

Basic syntax of createCollection() method

```
>use test
switched to db test
>db.createCollection("mycollection")
{ "ok" : 1 }
>
```

created collection by using the command show collections.

```
>show collections
mycollection
system.indexes
```

Installation of NoSQL

NoSQL is a non-relational database management Systems, different from traditional relational database management systems. It is designed for distributed data stores where very large scale of data storing needs.for example Google or Facebook which collects terabits of data every day for their users. Stands for Not Only SQL , No declarative query language, No predefined schema, Key-Value pair storage, Column Store, Document Store, Graph databases, Eventual consistency rather ACID property, Unstructured and unpredictable data, CAP Theorem, Prioritizes high performance, high availability and scalability, BASETransaction

Key Value Pair Based

Data is stored in key/value pairs. It is designed in such a way to handle lots of data and heavy load. Key-value pair storage databases store data as a hash table where each key is unique, and the value can be a JSON, BLOB(Binary Large Objects), string, etc.

For example, a key-value pair may contain a key.

Key	Value
Name	Joe Bloggs
Age	42
Occupation	Stunt Double
Height	175cm
Weight	77kg

Redis, Dynamo, Riak are some examples of key-value store DataBases. They are all based on Amazon's Dynamo paper.

Column-based NoSQL databases are widely used to manage data warehouses, business intelligence, CRM, Library card catalogs,

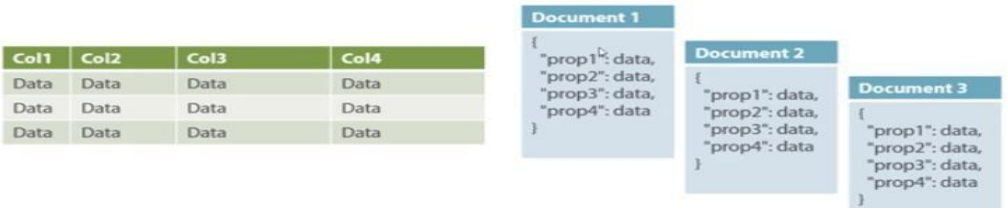
ColumnFamily			
Row Key	Column Name		
	Key	Key	Key
	Value	Value	Value
	Column Name		
	Key	Key	Key
	Value	Value	Value

HBase, Cassandra, HBase, Hypertable are examples of column based database.

Document-Oriented:

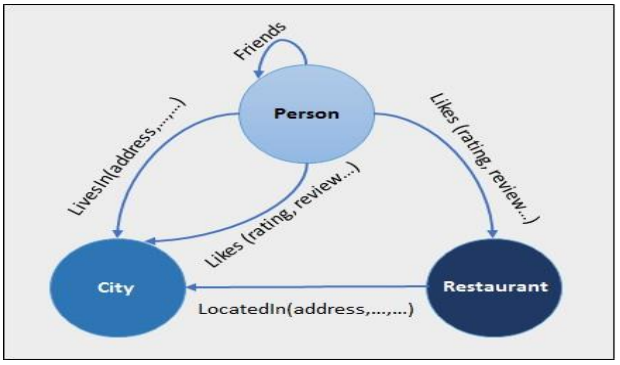
Document-Oriented NoSQL DB stores and retrieves data as a key value pair but the value part is

stored as a document. The document is stored in JSON or XML formats. The value is understood by the DB and can be queried.



Graph-Based

A graph type database stores entities as well the relations amongst those entities. The entity is stored as a node with the relationship as edges. An edge gives a relationship between nodes. Every node and edge has a unique identifier.



Experiment 6: Practicing DML commands

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

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

Inserting values into "Bus" table:

Insert into Bus values(1234,'hyderabad', ‘tirupathi'); Insert into Bus values (2345,’hyderabd’ ‘Banglore’); Insert into Bus values (23,'hyderabd','Kolkata');

Insert into Bus values (45,'Tirupathi,'Banglore'); Insert into Bus values(34,'hyderabd','Chennai');

Inserting values into "Passenger" table:

Insert into Passenger values (1, 45,'ramesh', 45,’M', ‘abc123'); Insert into Passenger values

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

Few more Examples of DML commands:

Select * from Bus; (selects all the attributes and display) UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

Experiment 7: Querying

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

Practice the following Queries:

Display unique PNR_no of all Passengers. Display all the names of male passengers. Display the ticket numbers and names of all the passengers.

Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'. Find the names of passengers whose age is between 30 and 45.

Display all the passengers names beginning with 'A' Display the sorted list of passengers names

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

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

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

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

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

Find the distinct PNR numbers that are present.

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

Find the total number of cancelled seats.

Experiment 10: **Triggers**

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

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

IF NEW.Tickent N0 > 60 THEN SET New.Tickent no = Ticket
no; ELSE SET New.Ticket no = 0; END IF;
END;

Experiment 11: Stored Procedures

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

Eg: CREATE PROCEDURE myProc()
BEGIN
SELECT COUNT(Tickets) FROM Ticket WHERE age>=40; End;

Experiment 12: PL/SQL

In this session you are going to learn PL/SQL programs with Oracle Database

Experiment 13: DCL Commands

DCL commands are used to for granting the permissions for security of data within the users.

Reference Books:

1. Introduction to SQL,Rick F.Vander Lans,Pearsoneducation..
2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova,Pearsoneducation.
3. Oracle PL/SQL Programming,StevenFeuerstein,SPD.
4. SQL & PL/SQL for Oracle 10g,B lack Book, Dr.P.S.Deshpande, DreamTech.
5. Ora cle D atab a se 11 g P L/S QL P ro gra m ming, M .M cLaughlin,TMH.
6. SQL Fundamentals, J.J.Patrick,PearsonEducation.

Course Outcomes:

The students will be able:

- To design a database based on the requirements by applying ER and Relationalmodel.
- To use normal forms for Schema Refinement and Transaction Management and SQL to interact with database to perform all types of DBoperations.
- Toanalyzethebusinessrequirementsandproduceaviablemodelforthe implementation of document oriented and distributeddatabases.
- To apply TCL and DCL Commands and to visualize all states of transactionoperations.

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3-/-/- 3

(R18A0507) DESIGN AND ANALYSIS OFALGORITHMS

OBJECTIVES:

- To analyze performance ofalgorithms.
- To choose the appropriate data structure and algorithm design method for a specifiedapplication.
- To understand how the choice of data structures and algorithm design methods impacts the performance ofprograms.
- 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 intractableproblems.
- To introduce P and NPclasses.

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:

4. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Sartaj Sahni and S. Rajasekharan, UniversitiesPress.
5. 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 andsons.
2. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ.Press
3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, PearsonEducation.
4. Foundations of Algorithms,, R. Neapolitan and K. Naimipour, 4th edition, Jones and Bartlett Studentedition.
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 ofalgorithms.
- Ability to choose appropriate algorithm design techniques for solvingproblems.
- Ability to understand how the choice of data structures and the algorithm design methods impact the performance ofprograms.

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3 -/-/- 3

(R18A0513) PYTHON PROGRAMMING

COURSE OBJECTIVES:

- To learn Programming Concepts of Python.
- To understand Python programs with conditionals and loops.
- To define Python functions and call them.
- To have knowledge of Python data structures –- lists, tuples, dictionaries.
- 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 asreturn 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

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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3 -/-/-3

(R18A0517) WEB TECHNOLOGIES

OBJECTIVES:

- Giving the students the insights of the Internet programming and how to design and implement complete applications over theweb.
- 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 webapplications,
- Programming Common Gateway Interfaces, Programming the User Interface for the webapplications

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, on submit, 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 SessionTracking.

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, ScriptingElements, implicit objects.

Java Beans: Introduction to Beans, Deploying java Beans in a JSP page.

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNITs 1,2)
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson (UNITs 3, 4,5)

REFERENCE BOOKS:

1. Programming world wide web-Sebesta, Pearson Education,2007.
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/ Pearson EducationAsia.
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 Holzner TataMcGraw-Hill.

Course Outcomes:

1. Analyze a web page and identify its elements andattributes.
2. Create web pages using XHTML and Cascading Stylessheets.
3. Installation and usage of Serversoftware's.
4. Database Connectivity to webapplications
5. Build web applications using Servlet andJSP

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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 embeddedsystem
3) To learn the design process of embedded systemapplications.
4) To understands the RTOS and inter-processcommunication.

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 embeddedsystems.

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 EditionTMH.
2. Kenneth. J. Ayala, The 8051 Microcontroller , 3rd Ed., CengageLearning
3. Introduction to Embedded Systems - shibu k v, Mc Graw HillEducation.

REFERENCE BOOKS:

1. Advanced Microprocessors and Peripherals – A. K. Ray and K.M. Bhurchandi, TMH, 2nd Edition2006
2. Embedded Systems- An integrated approach - Lyla B Das, Pearson education2012.

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 designapproaches
4) Learn the basics ofRTOS

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III Year B.Tech. IT -ISem

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((R18A1203) KNOWLEDGE MANAGEMENT
(Professional Elective 1)

OBJETIVES:

The students will be able to

- define the links between Knowledge Management, organizational learning, innovation and creativity
- understand the fundamental elements of KnowledgeManagement
- learn knowledge management objectives in projects across diversefields

UNIT I

Introduction – KM Life Cycle – Types of Knowledge -Approaches in Organizations -Five components of learning organization- Knowledge Sources.

UNIT II

Essentials of Knowledge Management Tools-Knowledge Creation Process – Knowledge Management Techniques.

UNIT III

Organizational Knowledge Management- Architecture and Implementation Strategies- Building the Knowledge Corporation- Implementing Knowledge Management in organization

UNIT IV

Knowledge Management System Life Cycle- Managing Knowledge Workers- Knowledge Audit- Knowledge Management Practices in Organizations- Case studies

UNIT V

Futuristic KM: Knowledge Engineering- Theory of Computation, Data Structure

TEXT BOOK:

1. Elias.M. Award&HassanM.Ghaziri–‖KnowledgeManagement‖Pearson Education 2003.
2. Knowledge Management – a resource book – A Thohothathri Raman, Excel,2004.
3. Knowledge Management- Elias M. Awad Hasan M. Ghazri, PearsonEducation

REFERENCES:

1 Guus Schreiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel Shadbolt, Walter Van de Velde and Bob Wielinga, –Knowledge Engineering and Management‖, Universities Press,2001.

2 C.W.Holsapple,–HandbooksonKnowledgeManagement‖, InternationalHandbookson Information Systems, Vol 1 and 2,2003

Course Outcomes:

The students will :

- Analyze and define the links between Knowledge Management, organisational learning, innovation and creativity
- Analyze the fundamental elements of KnowledgeManagement
- Examine and evaluate how leadership can be used to facilitate a human infrastructure to diffuse knowledge and enable bestpractice.
- Apply Knowledge Management objectives in projects across diversefields

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(R18A0519) COMPUTER GRAPHICS
(Professional Elective 1)

OBJECTIVES:

- To make students understand about fundamentals and applications ofGraphics.
- To learn and understand 2 D and 3 D transformations and relatedalgorithms.
- To enable them to design animated scenes for virtual objectcreations.
- To make the students present the contentgraphically.

UNIT-I:

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

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-fillalgorithms

UNIT-II:

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

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

UNIT-III:

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

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

UNIT-IV:

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

UNIT-V:

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

TEXT BOOKS:

1 –ComputerGraphics Cversion‖, Donald Hearnand M.PaulineBaker,Pearson Education

2 –ComputerGraphicsPrinciples&practice‖, second edition in C,Foley, VanDam, Feiner and Hughes, PearsonEducation.

REFERENCES:

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

Outcomes:

- Students can animate scenes inentertainment.
- Development of simple graphicsapplications.
- Ability to work in computer aided design for contentpresentation.
- Better analysis of data with pictorial representation.

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III Year B.Tech. IT - I Sem **LT/P/D C**

3 -/-/- 3

(R18A1205) ARTIFICIAL INTELLIGENCE

Course Objectives: To train the students to :

1. Understand different types of AI agents and various search algorithms
2. Learn the fundamentals of knowledge representation.
3. Be aware of knowledge-based systems and to apply knowledge representation and reasoning.
4. Study Markov Models which 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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III Year B. Tech IT –I Sem **L T/P/ C**

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(R18A0588) Python Programming Lab

COURSE OBJECTIVES

- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, and dictionaries.
- 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 ADDITITON 2. TO PERFORM SUBTRACTION
3. TO PERFORM MULTIPICATION 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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. IT -ISem **L T/P/D C**

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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 three**frames**.

2) LOGINPAGE

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

4) REGISTRATION PAGE

Week 2

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

Week 3

Write JavaScript to validate the following fields of the Registration page.

1. **First Name** (Name should contains alphabets and the length should not be less than 6 characters).
2. **Password** (Password should not be less than 6 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 thebook
2) AuthorName
3) ISBNnumber
4) Publishername
5) Edition
6) Price

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

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 remainingcolumns.

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 andDay.
b) Write a PHP Script to check whether the given number is Palindrome ornot
c) A web application that takes name and age from an HTML page. If the age is less than 18, itshouldsendapagewith‖Hello<name>,youarenotauthorizedtovisitthesite‖message, where <name> should be replaced with the entered name. Otherwise itshould send ‖Welcome<name>to thissite‖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).

(i) Write a PHP Program to display current Date, Time and Day.

(**i**) 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>shouldbereplacedwiththeenteredname.Otherwiseitshouldsend ‑Welcome<name>to thissite‖message.

(iv) Aweb 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 andDay.

(ii) A web application that takes name and age from an HTML page. If the age is less than 18, itshouldsendapagewith‑Hello<name>,youarenotauthorizedtovisitthesite‖message, where <name> should be replaced with the entered name. Otherwiseit should send ‑Welcome<name>to thissite‖message.

(iii) Write a program for deploying **Java Beans** in a JSPpage.

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 UniversityPress
2. The Complete Reference PHP — Steven Holzner, TataMcGraw-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 DuckettWROX.
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 webapplications
- Use Tomcat Server for Servlets andJSPs
- Write simple applications with Technologies like HTML, Javascript, AJAX, PHP, Servlets andJSPs
- Connect to Database and getresults
- Parse XML files using Java (DOM and SAXparsers)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. IT -ISem **L T/P/D C**

2 -/-/- -

(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 mock interviews.

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 professionalfields.
- To improve language proficiency and develop the required professionalskills.
- To equip students with tools to organize, comprehend, draft short and long forms of technicalwork.

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.

OPENELECTIVE–II

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech.ISem **L T/P/DC**

3 -/-/- 3

OPEN ELECTIVE II

(R18A1251) MANAGEMENT INFORMATIONSYSTEMS

COURSE OBJECTIVES:

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

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 Defination and orgin 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 india2012.
2. Jawadekar, MIS Text and Cases, TMH,2012.
3. DrMilind MOka–Casesin ManagementInformation system _Everest,2012.
4. AKGupta, Sharma–Management ofSystems‖Macmillan, 2012.
5. SandraSenf–Information TechnologyControl and Audit‖3e, CRC Press,2012.
6. Apache OFBiz for Ecommerce and ERP -https://ofbiz.apache.org/
7. Magneto for Ecommerce (B2B Commerce) -https://magento.com/
8. Adempiere – ERP :http://www.adempiere.net/web/guest/welcome
9. Analytica – DSS -http://www.lumina.com
10. OpenRules – Business Rules and Decision Management system - http://openrules.com/

COURSE OUTCOMES:

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. I Sem	L	T/P/D	C
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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 andpolymorphism;
2) use data types, arrays and strings;
3) implement error-handling techniques using exceptionhandling,
4) create and event-driven GUI using AWTcomponents.

UNIT I: OOP Concepts: Data abstraction, encapsulation, inheritance, Polymorphism, classes and objects, Procedural and object oriented programming paradigms.
Java Basics History of Java, Java buzzwords, data types, variables, constants, scope and life time of variables, operators, expressions, control statements, type conversion and casting, simple java programs, concepts of classes, objects, arrays, strings, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, Buffered Reader class, Scanner class, String Tokenizer class, inner class.

UNIT II: Inheritance – Types of Inheritance, super keyword, and preventing inheritance: final classes and methods.
Polymorphism – Dynamic binding, method overriding, abstract classes and methods.
Interfaces- Interfaces Vs Abstract classes, defining an interface, implement interfaces, extending interface.
Packages- Defining, creating and accessing a package, importing packages.

UNIT III: Exception handling - Concepts of exception handling, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, checked exceptions and unchecked exceptions, built in exceptions.
Multi threading: Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, inter thread communication.

UNIT IV: Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.
Event Handling: Events, Handling mouse and keyboard events, Adapter classes.
Files- Streams- Byte streams, Character streams, Text input/output.

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

AWT controls: Labels, button, text field, check box, and graphics. **Layout Manager –** Layout manager types: border, grid and flow. **Swing** – Introduction, limitations of AWT, Swing vs AWT.

TEXT BOOKS:

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

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, UniversitiesPress.
3. Thinking in Java, Bruce Eckel,PE
4. Programming in Java, S. Malhotra and S. Choudhary, Oxford UniversitiesPress.

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 levellanguage;
3) An appreciation of the principles of object orientedprogramming;
4) An awareness of the need for a professional approach to design and the importance of good documentation to the finishedprograms.
5) Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular softwareproblem.
6) Be able to make use of members of classes found in the JavaAPI.
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 ofrequirements.
8) Able to develop applications using Applet, awt and GUIProgramming.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. I Sem	**L**	**T/P/D**	**C**
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OPEN ELECTIVE II

(R18A01252) SOFTWARE PROJECT MANAGEMENT

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 toproject andprocess management
2) Understanding the basic infrastructure competences (e.g., process modelingand measurement)
3) Understanding the basic steps of project planning, project management, quality assurance, and process management and theirrelationships

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 TechnicalPerspective.

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. WalkerRoyce,–SoftwareProject Management‖,1998, PEA.
2. Henry,–SoftwareProjectManagement‖, Pearson.

Reference Books:

1. Richard H.Thayer.‖ Software Engineering Project Management‖, 1997, IEEE Computer Society.
2. ShereK.D.:–SoftwareEngineeringand Management‖,1998,PHI.
3. S.A.Kelkar,–SoftwareProject Management: AConciseStudy‖,PHI.
4. Hughes Cotterell, –SoftwareProject Management‖, 2e, TMH. 88 5. KaeronConway, –SoftwareProject Management from Concept toD

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 ofproject
2) Compare and differentiate organization structures and projectstructures.
3) Implement a project to manage project schedule, expenses and resource with the application of suitable project managementtools

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech.I sem T/P/D

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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,2 nd 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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. TechISem **L T/P/D C**

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OPEN ELECTIVE II

(R15A0354) NANO TECHNOLOGY

COURSE OBJECTIVES:

- To learn about basis of NanoMaterials.
- In this course we focus on synthetic aspects for the design of nanostructuredmaterials.
- 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 nanostructuredmaterials.
- 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 thesenanostructures.
- The dependence of various properties (dielectric, magnetic and optical) with size will bediscussed.

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 nano particles, Electronic conduction with nano- particles.

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

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

UNIT–III

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

UNIT–IV

Tools to Characterize Nanomaterials: X-Ray Diffraction (XRD), Small Angle X-ray

scattering (SAXS), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscope (STM), Field Ion Microscope (FEM), Three-dimensional Atom Probe (3DAP), Nanoindentation

UNIT–V

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

TEXT BOOKS:

1. Text Book of Nano Science and Nano Technology – B.S. Murthy, P. Shankar, Baldev Raj, B.B. Rath and James Munday, 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 Ltd1996.

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.

MALLA REDDY COLLEGE OF ENGINEERING ANDTECHNOLOGY

III Year B.Tech. IT -IISem **LT/P/DC 3**

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(R18A0518) COMPUTER NETWORKS

OBJECTIVES:

- To introduce the fundamentals of computernetworks.
- To demonstrate the framework of TCP/IP & OSImodel.
- To know the role of various protocols inNetworking.
- To learn the detailed functioning of various networklayers.

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 andgateways.

UNIT - III:

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Count to Infinity Problem, Link State Routing, Path Vector Routing, Hierarchical Routing; Congestion control algorithms,

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

UNIT - IV:

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

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

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

TEXT BOOKS:

1. Computer Networks - Andrew S Tanenbaum, 4th Edition, PearsonEducation.
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, PearsonEducation.

Outcomes:

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

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III Year B.Tech. IT -IISem **L T/P/D C**

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(R18A0524) DATA WAREHOUSING AND DATA MINING

OBJECTIVES:

- Study data warehouse principles and itsworking.
- Learn data mining concepts and understand association rulesmining.
- Study classificationalgorithms
- Gain knowledge of how data is grouped using clusteringtechniques.

UNIT-I

Data warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction-Transformation-Loading, Logical(Multi- Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact- Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture-ROLAP, MOLAP and HOLAP.

UNIT-II

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or Data Warehouse System, Major issues in DataMining.

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; APRIOIRI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set- Maximal Frequent Item Set, Closed Frequent Item Set.

UNIT-IV

Classification: Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers , Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction ; Naive-Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics.

Prediction: Accuracy and Error measures. Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods

UNIT-V

Cluster Analysis : Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods,

Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model based Clustering Methods, Outlier Analysis.

TEXT BOOKS:

1) Data Mining- Concepts and -1.chniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition,2006.

2) Introduction to Data Mining, Psng-Ning Tan, Vipin Kumar, Michael Steinbanch, PearsonEducatior.

REFERENCE BOOKS:

1) Data Mining Techniques, Arun KPujari, 3rd Edition, UniversitiesPress.
2) Data Warehousing Fundament's, Pualraj Ponnaiah, Wiley StudentEdition.
3) The Data Warehouse Life CycleToolkit — Ralph Kimball, Wiley StudentEdition.
4) Data Mining, Vikaram Pudi, P Rddha Krishna, Oxford UniversityPress

Outcomes:

- Comparison of functional differences between data warehouse and databasesystems.
- Ability to perform the pre-processing of data and apply mining techniques onit.
- Capability to identify the association rules, classification and clusters in large datasets.
- Skills to solve real world problems in business and scientific information usingdatamining

MALLA REDDY COLLEGE OF ENGINEERING ANDTECHNOLOGY

III Year B.Tech. IT -IISem LT/P/DC 3 - /-/- 3

(R18A0525)LINUX PROGRAMMING

OBJECTIVES:

- To develop the skills necessary for Unix systems programming including file system programming, process and signal management, and inter processcommunication.
- To make effective use of Unix utilities and Shell scripting language such asbash.
- To develop the basic skills required to write network programs usingSockets.

UNIT I

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.

Sed-Scripts, Operation, Addresses. A**wk**- Execution, Fields and Records, Scripts, Operation, Patterns, Actions.

Shell programming with Bourne again shell(bash)- Introduction, shell responsibilities, pipes and

Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples.

UNIT II

Files and Directories- File Concept, File types, File System Structure, file metadata-Inodes, kernel support for files, system calls for file I/O operations- open, create, read, write, close, lseek, dup2,file status information-stat family, file and record locking-lockf and fcntl functions, file permissions - chmod, fchmod, file ownership-chown, lchown, fchown, links-soft links and hard links – symlink, link, unlink.

Directories-Creating, removing and changing Directories-mkdir, rmdir, chdir, obtaining current working directory-getcwd, Scanning Directories-opendir, readdir, closedir, rewinddir, seekdir, telldir functions.

UNIT III

Process – Process concept, Kernel support for process, process identification, process hierarchy, process states, process control - process creation, waiting for a process, process termination, zombie process, orphan process, system call interface for process management-fork, vfork, exit, wait, waitpid, exec family.

Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, kill, raise , alarm, pause, abort, sleep functions.

UNIT IV

Interprocess Communication - Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, **pipes**-creation, IPC between related processes using unnamed pipes, FIFOs-creation, IPC between unrelated processes using FIFOs (Named pipes),differences between unnamed and named pipes, popen and pclose libraryfunctions.

Message Queues- Kernel support for messages, APIs for message queues, client/server example.

Semaphores-Kernel support for semaphores, APIs for semaphores.

UNIT V

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

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

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan,PHI.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das,TMH,2006.
3. Unix Network Programming, W.R.Stevens, PHI

REFERENCE BOOKS:

1. Linux System Programming, Robert Love, O'Reilly, SPD,rp-2007.
2. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables,Pearson2003,
3. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson.
4. System Programming with C and Unix, A.Hoover,Pearson.

Outcomes:

1. Identify and use Linux utilities to create and manage simple file processingoperations
2. Develop shell scripts to perform more complex tasks.
3. Illustrate file processing operations such as standard I/O and formattedI/O.
4. Generalize Signal generation and handlingsignals.
5. Develop client server Inter Process Communication (IPC)Mechanisms.
6. Illustrate multithreading concepts to reduce the wastage ofCPUtime.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. IT -IISem **L T/P/D C**

3 -/-/- 3

(R18A0520) DISTRIBUTED SYSTEMS
(Professional Elective 2)

Objectives:

- To learn the principles and programming models used in distributedsystems.
- To know the concept ofIPC
- To understand the framework of DFS andDSM.
- To be aware of the concept of Distributedtransaction.

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 inUNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between distributed objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI

UNIT IV

Distributed File Systems: Introduction, File Service

Architecture, Case Study 1: Sun Network File System.

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 & Fransis Group,2007.

Course Outcomes:

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. IT -IISem

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,HaoxiangWang,ComputerandCyberSecurity:Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335,2018.

REFERENCES:

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

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

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. IT -IISem **LT/P/DC 3**

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(R18A0527) MOBILE COMPUTING
(Professional Elective 2)

Course Objectives:

- To make the student understand the concept of mobile computing paradigm, its novel applications andlimitations.
- 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 & TransportLayer
- To understand the database issues in mobile environments & data deliverymodels.
- To understand the ad hoc networks and related concepts.
- To understand the platforms and protocols used in mobileenvironment.

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/(IEEE802.11)

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.JochenSchiller, ‐Mobile Communications‖,Addison-Wesley, Second Edition, 2009. 2.RajKamal, ‐Mobile Computing‖, Oxford University Press, 2007, ISBN: 0195686772.

REFERENCE BOOKS:

1. Jochen Schiller,‐MobileCommunications‖,Addison-Wesley,Second Edition,2004.
2. Stojmenovic and Cacute,‐Handbook ofWirelessNetworksand MobileComputing‖, Wiley, 2002, ISBN0471419028.
3. RezaBehravanfar,‐MobileComputingPrinciples: DesigningandDevelopingMobile Applications with UML and XML‖, ISBN: 0521817331, Cambridge University Press, Oct 2004.

Course Outcomes:

- Able to think and develop new mobileapplication.
- 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/oralgorithms/protocols.
- Able to understand & develop any existing or new protocol related to mobile environment

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. IT -IISem **L T/P/DC**

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(R18A1281)DATAWARE HOUSING & DATAMININGLAB

OBJECTIVES:

Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration and Pentaho Business Analytics), Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA), Understand the data sets and data preprocessing, Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering and regression, Exercise the data mining techniques with varied input values for differentparameters.

LIST OF EXPERIMENTS:

Experiments using Weka & Clementine Tools

1. Data Processing Techniques:
   (i) Data cleaning (ii) Data transformation - Normalization (iii) Data integration
2. Data Warehouse schemas – star, snowflake, fact constellation
3. Data cube construction – OLAPoperations
4. Data Extraction, Transformations & Loadingoperations
5. Implementation of Attribute oriented inductionalgorithm
6. Implementation of apriorialgorithm
7. Implementation of FP – Growthalgorithm
8. Implementation of Decision TreeInduction
9. Calculating Information gainmeasures
10. Classification of data using Bayesianapproach
11. Classification of data using K – nearest neighbour approach
12. Implementation of K – meansalgorithm
13. Implementation of PAMalgorithm

Outcomes:

- Ability to add mining algorithms as a component to the existingtools
- Ability to apply mining techniques for realisticdata.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech. IT -IISem **L T/P/DC**

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(R18A0590) LINUX PROGRAMMING LAB

OBJECTIVES:

- To write shell scripts to solveproblems
- To implement some standard Linux utilities such as ls, cp etc using systemcalls.
- To develop network-based applications usingC.

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 init.

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 argumentfiles.

Week 3:

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

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 givennumber.

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 executepermissions

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 aC program to create child processand allowparent process to display–parent‖and thechild to display–child‖ on thescreen

b) Write a C program to create zombieprocess

c) Write a C program to illustrate how an orphan process iscreated

Week 9:

a) Write a C program that illustrate communication between two process using unnamed pipes

b) Write a C program that illustrates communication between two process using named pipes orFIFO.

Week 10:

a) Write a C program for FileLocking.

b) Write a C program that receives a message from message queue and displaythem.

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

MALLA REDDY COLLEGE OF ENGINEERING ANDTECHNOLOGY

III Year B.Tech. IT -IISem **L T/P/D C**

2 -/-/- -

(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 contributionshasbeenrecognizedthroughouttheworldanditgraduallymadeit‐asoneof the strongest court in theworld‖.

Thiscourse‐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 itspower.
- To enable the students to analyze the politicalprinciples.
- To enable the students to be aware of their fundamental rights andduties.

The following course content is prescribed for thiscourse.

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 underArticle21.

OUTCOMES:

Students will be able to:

- improve their knowledge about Indianconstitution
- value their identity and exercise their fundamentalrights.
- understand how differently government bodiesfunction.

OPENELECTIVE–III

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech.IISem **L T/P/DC**

3 -/-/- 3

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 andsensors.
3) To study about AVR RISC Microcontroller architecture indetail.
4) To study about ARM Processor indetail.
5) To study about Artificial Intelligence inRobotics.

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 approch‖, Pearson Education,
India2003.

[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 andsensors.
3) Understand AVR RISC Microcontroller architecture indetail.
4) Understand about ARM Processor indetail.
5) Understand about Artificial Intelligence inRobotics.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech.II Sem

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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.

UNITI: 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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IIIYear B.Tech -IISem **L T/P/D C**

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(OPEN ELECTIVE - III)
(R18A1253) SOFTWARE TESTING TECHNIQUES

COURSE OBJECTIVES:

- Knowing the concepts of Software Engineering and software development life cycle.
- Understanding the foundations, techniques, and tools in the area of software testing and its practice in theindustry.
- Learning the functional aspect of the various testingtechniques.
- Knowledge of the creation of test cases and usage of testingtools.

UNIT – IINTRODUCTION

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.

UNIT – II SOFTWARE TESTING REQUIREMENTS

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.

UNIT – III TESTING TECHNIQUES

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.

UNIT – IV TESTING TYPES

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.

UNIT – V TEST CASE DESIGN

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, secondedition.
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, Gopalaswamy Ramesh,‖Software Testing: Principles and Practice‖, Pearson Education India, First Impression2006.
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 givenapplication.
4) Development of test cases and selection of appropriate testingtool.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech.IISem

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OPEN ELECTIVE III

(R18A0355) TOTAL QUALITY MANAGEMENT

COURSE OBJECTIVES:

- To facilitate the understanding of Quality Management principles and process.
- 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 AcceptanceSampling.

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 &TregoeMethodology.

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 thesystem.

TEXT BOOK:

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

REFERENCE BOOKS:

- Beyond TQM / RobertL.Flood
- Total quality management by PaneerSelvam
- Statistical Quality Control / E.L.Grant.
- Total Quality Management:A Practical Approach/H.Lal
- Quality Management/Kanishka Bedi/Oxford UniversityPress/2011
- Total Engineering Quality Management/SunilSharma/Macmillan

COURSE OUTCOMES:

1) The student would be able to apply the tools and techniques of quality management to manufacturing and servicesprocesses.
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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III Year B.Tech.IISem **L T/P/D C**

3 -/-/- 3

OPEN ELECTIVE III

(R18A0251) ELECTRICAL SYSTEMS & APPLICATIONS

COURSE OBJECTIVES:

- To introduce the fundamental concepts of electro mechanical energyconversion
- To familiarize the students with the principle of operation, constructional features and operational characteristics of various types of Motors used in the engineering and consumerIndustry

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. Uppaland G. C. Garg,-Electrical Wiring, Estimating&Costing‖, Khannapublishers, 2008.

2 K. B. Raina,-ElectricalDesign, Estimating&Costing‖, NewageInternational,2007.

3 H. Joshi, -ResidentialCommercial andIndustrialSystems‖,McGrawHill Education,2008.

REFERENCE BOOKS:

1 N.V. Suryanarayana,-Utilization ofElectrical Power includingElectricdrivesand Electric traction‖, New Age International (P) Limited Publishers, 1stEdition,1994.

2 E.Open Shaw Taylor,-Utilization of Electric Energy‖,OrientLongman,1st Edition,1937

COURSE OUTCOMES:

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

1) Maintain/Troubleshoot various lamps and fittings inuse.
2) Design Illumination systems for variousapplications.
3) Utilize effectively the electrical systems inindustries.

MALLA REDDY COLLEGE OF ENGINEERING ANDTECHNOLOGY

III Year B.Tech.IISem	**L**	**T/P/DC**
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OPEN ELECTIVE III
(R18A0554) OPERATING SYSTEM CONCEPTS

OBJECTIVES:

- To learn the fundamentals of OperatingSystems.
- To learn the mechanisms of OS to handle processes and threads and their communication
- To learn the mechanisms involved in memory management in contemporaryOS
- Mutual exclusion algorithms, deadlock detection algorithms and agreementprotocols
- To know the components and management aspects of concurrencymanagement

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:

MemoryManagement:

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 –Avil Silberschatz 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 of India

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 AND TECHNOLOGY

IV Year B.Tech IT –ISem

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(R18A1206) PROGRAMMING FOR APPLICATION DEVELOPMENT

Course Objectives:

1. To get an overview of the various technologies, which can help in the implementation of the various liveProject.
2. To Understand the Basic Concepts ofC#
3. To Understand the Exception HandlingMechanisms
4. To Understand the Various Concepts of .netAssemblies

UNIT I:

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

UNIT II:

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

UNIT III:

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

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

UNIT IV:

Delegates And Events: Understanding the .NET Delegate type, defining a Delegate Type in C#, The System. Multicast Delegate and System. Delegate Base Classes, PROGRAMMING

WITH .NET ASSEMBLIES: Configuring .NET Assemblies, defining Custom Namespaces, The role of .NET Assemblies, Understanding the Format of a .NET assembly, Building and Consuming a Single-File Assembly, Building and Consuming a Multifile Assembly, Understanding Private Assembly, Understanding Shared Assembly, Consuming a Shared Assembly, Configuring Shared assemblies.

UNIT V:

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

2. Herbert Schildt (2004), The Complete Reference: C#, Tata McGraw-Hill, New Delhi, India. 3.Simon Robinson, Christian N agel, Karli Watson, Jay Gl (2006), Professional C#, 3rd edition, Wiley &Sons,India.

Course Outcome:

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

1. Implementation of Oops Concepts inASP.net
2. Be able to Implement, Compile, Test & Run ApplicationsPrograms.
3. Demonstrate the ability to use Exception HandlingMechanisms.
4. Able to Develop Applications usingAsp.net,C#.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV B.Tech I sem **L T/P/D C**

3 -/-/- 3

(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 recourses 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.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV Year B.Tech IT –I Sem **L T/P/C**
3 -/-/- 3

(R18A0523) CLOUD COMPUTING

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

Outcomes:

- Ability to analyze various service delivery models of cloud computing
- Capability to interpret the ways in which the cloud can be programmed and deployed.
- Capacity 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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IV Year B.Tech IT –I Sem **L T/P/D C**

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(R18A1208) BUSINESS DATA ANALYTICS

Course Objectives:

- To study about the different types of data and analytics.
- To introduce big data tools and information standard formats.
- To study classifications of Business Analytics.
- To learn the applications and technologies of Business Analytics.
- To study about future impact and emerging trends in Business Analytics.

Unit I

Big Data

Types of Digital Data: Structured, Unstructured and Semi- Structured data.

Big Data from business Perspective: Introduction of Big data, Big data Architecture, Characteristics of Big data, Data in the Warehouse: Data Warehouse Introduction, Difference between Data Ware house and Big data., Importance of Big data, Applications of Big data, Big data tools.

Unit II

Introduction to MongoDB and MapReduce Programming

MongoDB: Why MongoDB-Terms used in RDBMS and MongoDB- Data Types- MongoDB Query Language. MapReduce: Mapper-Reducer-Combiner-Partitioner-Searching-Sorting-Compression.

Unit III

Business Analytics- Descriptive and Predictive Analytics

Introduction to Business Analytics: What and Why Business Analytics, Business Analytics Importance, Descriptive Analytics-Data Warehousing, Business Reporting, Visual Analytics, and Business Performance Management, Predictive Analytics- Techniques for Predictive Modeling, Web Analytics, Web Mining, and Social Analytics-Case Study.

Unit IV

Business Analytics-Prescriptive Analytics

Prescriptive Analytics-Case Study, Model-Based Decision Making: Optimization and Multi-Criteria Systems, Modeling and Analysis: Heuristic Search Methods and Simulation-Case Study.

Unit V

Business Analytics: Emerging Trends and Future Impacts

Opening Vignette, Location-Based Analytics for Organizations, Analytics Applications for Consumers, Web 2.0 and Online Social Networking, Cloud Computing and Bl, Impacts of Analytics in Organizations, Analytics Ecosystem.

Textbooks:

1. MarcJ.Schniederjans,DaraG.Schniederjans,ChristopherM.Starkey-Business Analytics Principles, Concepts and Applications (What, Why and How),Pearson.2014.
2. Business Intelligence and Analytics – R. Sharada, D Delen , E. Turbon - Tenth Edition.
3. Fundamentals of Business Analytics , R.N.Prasad & Seema Acharya, WileyPublications,2nd Edition,2016.

REFERENCEBOOKS:

Frank J Ohlhorst,—Big Data Analytics: Turning Big Data into Big Money Wiley and SAS Business Series,2012.

Course Outcomes: Students shall be able to

- Design the database for Data Analytics.
- Obtain knowledge on information standard formats.
- Work on tool like MongoDB and understand Machine learning algorithms.
- Design the Business Analytics Applications for Consumers.
- Understand impact and trends in Business Analytic.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV Year B. Tech. IT –I Sem **L T/P/ C**
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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, 3rdEdition, 1997.
2. Ethem Alpaydin, "Introduction to Machine Learning", MIT Press, Prentice Hall of India, 3rd Edition2014.
3. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar " Foundations of Machine Learning", MIT Press,2012.

Reference Books

1. Charu C.Aggarwal, "DataClassificationAlgorithmsandApplications",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 Kambers and JianPei, "Data Mining Concepts andTechniques",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.

MALLA REDDY COLLEGE OF ENGINEERING ANDTECHNOLOGY

IV Year B.Tech IT –ISem **LT/P/DC 3**

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(R18A0531) INTERNET OF THINGS
(Professional Elective 3)

Objectives

:

1. To introduce the terminology, technology and itsapplications
2. To explain the concept of M2M (machine to machine) with necessary protocols
3. To introduce the Python Scripting Language which is used in many IoT devices
4. To elucidate the Raspberry PI platform, that is widely used in IoT applications
5. To explain the implementation of web based services on IoTdevices

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 NETCOZF, 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 AP

Course Outcomes :

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

1. Explain the importance and usage ofIOT.
2. Describe the various IOT levels andprotocols.
3. Develop programs inPython.
4. Illustrate the functioning of IOTdevices.
5. Relate IOT to cloud computing and webapplications.

TEXT BOOK:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN:9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN:9789350239759
3. www.universityupdates.in ||www.android.universityupdates.in

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV Year B.Tech IT –ISem **L T/P/D C**

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(R18A0522) SOFTWARE TESTING METHODLOGIES
(Professional Elective 3)

Objectives:

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

UNIT I:

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

UNIT II:

Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

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:

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

REFERENCES:

1. The craft of software testing - Brian Marick, PearsonEducation.
2. Software Testing Techniques –SPD(Oreille)
3. Software Testing in the Real World – Edward Kit,Pearson.
4. Effective methods of Software Testing, Perry, JohnWiley.
5. Art of Software Testing – Meyers, JohnWiley.

OUTCOMES:

1. Ability to test a process for continuous quality improvement
2. Generation of test cases fromrequirements
3. Analysis of Modeling techniques: UML: FSM and State charts, Combinatorial designetc. 4.Test generation from models.
5. Test adequacy assessment.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV Year B.Tech IT –ISem **L T/P/D C**

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(R17A1282) PROGRAMMING FOR APPLICATIONDEVELOPMENT LAB

WEEK 1

Learning to use Visual Studio 2019
IDE Building Console Application
Project

WEEK 2

Write a Program to generate the factorial of a given number by using command line argument
Write a Program to generate Fibonacci series
Write a program to generate the temperature conversion

WEEK 3

Write a program to generate Pascal Triangle .
Write a program which asks for a symbol and a width, and displays a triangle of that width, using that number for the inner symbol

WEEK 4

Write a program to find the second highest value in an array
Write a program that at accept an array and a number to be searched in an array if found display proper message and its position in a array

WEEK 5

Write a console program to develop tic-tac toe game
Create a function named "ChangeChar" to modify a letter in a certain position (0 based) of a string,replacingitwithadifferentletterex:ChangeChar(‒crush‖,2,‘a‘)

WEEK 6

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

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

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

WEEK 7

1. Write a program to create interface named test. In this interface the member function is square. Implement this interface in arithmetic class.Create one new class called ToTestInt in this class use the object of arithmeticclass.
2. Create an outer class with a function display, again create another class inside the outer class named inner with a function called display and call the two functions in the mainclass.

WEEK 8

1. Write a program for example of try and catch block. In this check whether the given array size is negative ornot.
2. Write a program to illustrate usage of try multiple catch with finallyclause

3. Write a program for creation of user defined exception to show whether candidate is eligible to caste vote.

WEEK 9

1. Create a console application that displays current date a time for 10 times with the time interval of 2 seconds(use sleep()method

2. Write a program that demonstrates a high-priority thread using Sleep to give lower-priority threads a chance torun.

WEEK 10

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

WEEK 11

1. Create a console application to deploy on global assemble cache(usinggacutil)

2. Create a bank namespace with various classes (Saving , Current) and implement the namespace in anotherapplication

WEEK 12

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

Write a program to update books details using sql procedures

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. Tech IT –I Sem **L T/P/D C**

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(R18A1283) Mobile Application Development Lab

Course Objectives:

Upon completion of this course, students are expected to:

□ To learn how to develop Applications in android environment.

□ To learn how to develop user interface applications.

□ Create a mobile Application by using various components like activity, views, services, content providers and receivers

□ To learn how to develop URL related applications.

□ To learn how to develop storing, sharing and retrieving the data in Android 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.
11. Develop an Android application using controls like Button, TextView, EditText for designing aCalculator having basic functionality like Addition, Subtraction, Multiplication, and Division.
12. Develop a simple application with one EditText so that the user can write some text in it. Create a button called “Convert Text to Speech” that converts the user input text into voice.

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IVYear B.Tech IT–IISem **LT/P/D**

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(R18A1209)TOOLS AND TECHNIQUES OF DATA SCIENCE

Course Objectives

- To understand the various concepts in Data science process.
- To study the applications of Data Science.
- To learn to set up the data science tools environment and implement in Python and R
- To learn to write programs in Python and R for data science projects.
- To know the process of data visualization & data manipulation w.r.to Data Science.

UNIT - I

Introduction to Data Science – The data science process – Roles in data science project – Stages of Data Science Project – Defining the goal – Data collection and Management – Modelling – Model evaluation – Presentation and documentation – Model deployment and Maintenance

Applying Data science in Industry – Benefits from Business centric Data Science – Data Analytics and Types – Common Challenges in Analytics – Distinguishing between Business Intelligence and Data Science

UNIT-II

Using Data Science to Extract meaning from Data – Machine learning –Modeling with instances

Data science tools environment - Python – overview - Setting up Data science toolbox.

UNIT – III

Usage of Data Science tools environment-Essential concepts and Tools – Obtaining Data-Managing your Data workflow-Drake

Techniques using Python Tools - k – Nearest Neighbours – Naive Bayes

UNIT-IV

Techniques using R Tools - R programming overview - Loading data into R – Modeling methods – choosing and evaluating models – Linear and logistic Regression

UNIT-V

Data manipulation using Pandas- Installing and using Pandas-Introducing Pandas Objects-Data Indexing and selection-Handling Missing data, Merge and joining Data sets, Aggregation and Grouping.

Data visualization using Mat plot lib – Simple Line Plots-Simple scatter plots,Multiplesubplots,Visualization with sea born.

TEXT BOOKS:

1. J. Janssens, Data science at the command line, First edition. Sebastopol, CA:O'Reilly, 2014..
2. J. Grus, Data Science from Scratch: First Principles with Python, First edition.Sebastopol, CA: O'Reilly Media, 2015.
3. N. Zumel and J. Mount, Practical data science with R. Shelter Island, NY: ManningPublications Co, 2014.

REFERENCE BOOKS:

1. L. Pierson and J. Porway, Data science, 2nd edition. Hoboken, NJ: John Wiley and Sons, Inc, 2017.
2. C. O'Neil and R. Schutt, Doing Data Science: Straight Talk from the Frontline, First edition. Beijing ; Sebastopol: O'Reilly Media, 2013.
3. J. VanderPlas, Python Data Science Handbook: Essential Tools for Working withData, First edition. Shroff/O'Reilly, 2016.
4. S. R. Das, Data Science: Theories, Models, Algorithms, and Analytics. . https://srdas.github.io/MLBook/.

Course Outcomes:

Students will be able to

- Demonstrate the basic knowledge of data science process.
- Setup the software environment for python and R Lanaguage and apply various techniques to work with data.
- Manipulate and visualize the data using tools like pandas and mat plot lib.
- Analyze the various data science related projects.

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IV Year B.Tech IT –IISem LT/P/DC 3

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(R18A0535) IMAGE PROCESSING
(Professional Elective 4)

Course Objectives:

- To comprehend the relation between human visual system and machine perception and processing of digitalimages.
- To provide a detailed approach towards image processing applications like enhancement, segmentation, andcompression.

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 FrequencyDomain.

UNIT – III:

Image Restoration: Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, InteractiveRestoration.

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 MissTransformation.

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 2000Standards.

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, 2ndEdition

Course Outcomes:

- Exploration of the limitations of the computational methods on digitalimages.
- Expected to implement the spatial and frequency domain image transforms on enhancement and restoration ofimages.
- Elaborate understanding on image enhancementtechniques.
- Expected to define the need for compression and evaluate the basic compressionalgorithms.

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IV Year B.Tech IT –IISem **L T/P/D C**

3 -/-/- 3

(R18A1210) ADHOC AND SENSOR NETWORKS

(Professional Elective 4)

Objectives:

- To understand the concepts of sensor networks.
- To know the MAC and transport protocols for ad hoc networks.
- To learn the security of sensor networks.
- To gain knowledge of the applications of ad-hoc and sensor networks.
- To understand various security practices and protocols of ad-hoc and sensor networks.

UNIT – I

Introduction to Ad Hoc Wireless Networks: Characteristics of MANETS, Applications of MANETS, Challenges Routing In MANETS: Topology based versus position based approaches, Topology based routing protocols, and position based routing, other routing protocols

UNIT – II

Data Transmission In MANETS: The broadcast storm, Multicasting, Geo casting. TCP Over Ad Hoc Networks: TCP protocol overview, TCP and MANETS, Solutions for TCP over Ad Hoc

UNIT – III

Basics Of Wireless Sensors And Applications: The Mica Mote, Sensing and Communication Range, Design Issues, Energy Consumption, Clustering of Sensors, Applications. Data Retrieval in Sensor Networks: Classification of WSNs, MAC Layer, Routing Layer, High- Level Application Layer Support, Adapting to the Inherent Dynamic Nature of WSNs.

UNIT – IV

Security: Security in Ad Hoc Wireless Networks, Key Management, Secure Routing, Cooperation in MANETs, Intrusion Detection Systems Sensor Network Platforms and Tools: Sensor network Hardware, Sensor Network Programming Challenges, and Node-Level Software Platforms.

UNIT – V

Operating System-Tiny OS: Imperative Language: nesC, Data flow style language: TinyGALS, Node-Level Simulators, NS-2 and its sensors network extension, TOSSIM.

Text Books:

1. Ad Hoc and Sensor Networks: Theory and Applications, Carlos de Morais Cordeiro and Dharma Prakash Agrawal, World Scientific Publications / CambridgeUniversityPress,2006.

2. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science Imprint, Morgan Kauffman Publishers,2005.

References:

1. Ad Hoc Wireless Networks: Architectures and Protocols, C. Siva Ram Murthy and B. S. Manoj, Pearson Education,2004.

2. Guide to Wireless Ad Hoc Networks, Sudip Misra, Isaac Woungang, and Subhas Chandra Misra, Springer International Edition,2011.

3. Guide to Wireless Sensor Networks, Sudip Misra, Isaac Woungang, and Subhas Chandra Misra, Springer International Edition,2012.

4. Wireless Mesh Networking, Thomas Krag and Sebastin Buettrich, O'ReillyPublishers,2007.

5. Wireless Sensor Networks – Principles and Practice, Fei Hu, Xiaojun Cao, An Auerbach book, CRC Press, Taylor & Francis Group,2010.

6. Wireless Ad hoc Mobile Wireless Networks-Principles, Protocols and Applications, Subir Kumar Sarkar, et al., Auerbach Publications, Taylor & Francis Group,2008.

7. Wireless Ad hoc Networking, Shih-Lin Wu, Yu-Chee Tseng, Auerbach Publications, Taylor & Francis Group,2007

8. Wireless Ad hoc and Sensor Networks–Protocols, Performance and Control, Jagannathan Sarangapani, CRC Press, Taylor & Francis Group, 2007,rp2010.

9. Security in Ad hoc and Sensor Networks, Raheem Beyah, et al., WorldScientific Publications /Cambridge University Press,2010

Course Outcomes:

- Ability to understand the state-of-the-art research in the emerging subject of Ad Hoc and Wireless Sensor Networks.
- Ability to analyze protocols developed for Ad Hoc and sensor networks.
- Ability to identify and address the security threats in Ad Hoc and sensor networks.
- Ability to solve the issues in real-time application development based on ASN.
- Ability to conduct further research in the domain of ASN.

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IV Year B.Tech IT –IISem **L T/P/D C**

3 -/-/- 3

(R18A0528) SERVICE ORIENTEDARCHITECTURE

(Professional Elective 4)

OBJECTIVES:

- The student should be madeto:
- Learn XMLfundamentals.
- Be exposed to build applications based onXML.
- Understand the key principles behindSOA.
- Be familiar with the web services technology elements for realizingSOA.
- Learn the various web servicestandards.

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 OrientedArchitecture: Concepts, Technology, and Design‖, Pearson Education, 2005.

REFERENCES:

1. Frank P.Coyle,–XML,Web Servicesand theData Revolution‖,PearsonEducation,2002.
2. EricNewcomer,Greg Lomow,–UnderstandingSOAwith WebServices‖,Pearson Education,2005.
3. Sandeep Chatterjee and JamesWebber,–DevelopingEnterpriseWeb Services: An Architect's Guide‖, 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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IV Year B.Tech IT –IISem **L T/P/D C**

3 -/-/- 3

(R18A1211) ADVANCED DATABASES

(Professional Elective 5)

Objectives:

- Learn the modelling and design ofdatabases.
- Acquire knowledge on parallel and distributed databases and itsapplications.
- Study the usage and applications of Object Orienteddatabase
- Understand the principles of intelligentdatabases.

UNIT I:

Parallel and Distributed Databases:

Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems .**Parallel Databases:** I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism – Design of Parallel Systems. **Distributed Database Concepts:** Distributed Data Storage – Distributed Transactions –Commit Protocols – Concurrency Control – Distributed QueryProcessing..

UNIT II:

Object Relational Databases: Concepts for Object Databases: Object Identity –Object structure – Type Constructors – Encapsulation of Operations – Methods – Persistence –Type and Class Hierarchies – Inheritance – Complex Objects . **Object Database Standards, Languages and Design:** ODMG Model – ODL – OQL. **Object Relational and Extended – Relational Systems:** Object Relational features in SQL/Oracle.

UNIT III:

Intelligent Databases: Active Databases: Syntax and Semantics (Starburst, Oracle, DB2)-Taxonomy- Applications Design Principles for Active Rules. **Temporal Databases:** Overview of Temporal DatabasesTSQL2. **Deductive Databases:** Logic of Query Languages – Data log Recursive Rules Syntax and Semantics of Data log Languages- Implementation of Rules and Recursion Recursive Queries in SQL. **Spatial Databases:** Spatial Data Types- Spatial Relationships Spatial Data Structures- Spatial Access Methods- Spatial DB Implementation.

UNIT IV:

Advanced Data Models: Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management -Location Dependent Data Distribution - Mobile Transaction Models. **Concurrency Control**: Transaction Commit Protocols- Multimedia Databases Information Retrieval- Data Warehousing Data Mining- Text Mining.

UNIT V:

Emerging Technologies:

XML Databases: XML-Related Technologies-XML Schema- XML Query Languages-Storing XML in Databases-XML and SQL- Native XML Databases. **Web Databases:** Geographic Information Systems- Biological Data Management. **Cloud Based Databases:** Data Storage Systems on the Cloud. Cloud Storage Architectures-Cloud Data Models- Query Languages. Introduction to BigData-Storage-Analysis.

Text Books:

1. R. Elmasri,S.B.Navathe,–Fundamentals of DatabaseSystems‖, Fifth Edition, Pearson Education/Addison Wesley,2007.
2. Thomas Cannollyand CarolynBegg,–DatabaseSystems,APractical Approach to Design,Implementation and Management‖, Third Edition, Pearson Education,2007.

References:

1. Henry FKorth, Abraham Silberschatz, S. Sudharshan, –DatabaseSystemConcepts‖,Fifth Edition, McGraw Hill, 2006.

Outcomes:

- Demonstrate the emerging databases such as XML, Cloud and BigData.
- Estimate the inquisitive attitude towards research topics indatabases.
- Apply the knowledge of XML in designing the databases.
- Develop the databases that are used in cloud andbigdata.

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IV Year B.Tech IT –IISem **L T/P/DC**

3 -/-/- 3

(R18A0534) BLOCK CHAIN TECHNOLOGY
(Professional Elective 5)

Course Objectives

- To enable the student to understand and appreciate, the importance of block chain technology and application of cryptography in block chain.
- To gain awareness of various implementations of block chain technology such as bit coin, Ethereum, and Hyper ledger.
- To understand the structure of a Block chain and why/when it is better than a simple distributed database.
- To provide conceptual understanding of the function of Block chain as a method of securing distributed ledgers.
- To understand a smart contract, Hyper ledger and its legal implications.

UNIT - I

Introduction to Block chain Technology – Distributed systems – The history of block chain – Introduction to block chain – CAP theorem and block chain – Benefits and limitations of block chain – Decentralization using block chain - Methods of decentralization – Routes to decentralization

UNIT-II

Cryptography in Block chain: Introduction – cryptographic primitives – Assymetric cryptography – public and private keys -line interface – Bit coin improvement proposals (BIPs) – Consensus Algorithms.

UNIT – III

Bit Coin - Introduction – Transactions – Structure - Transactions types – The structure of a block– The genesis block – The bit coin network– Wallets and its types– Bit coin payments– Bit coin investment and buying and selling bit coins – Bit coin installation – Bit coin programming and the command-line interface – Bit coin improvement proposals (BIPs).

UNIT-IV

Ethereum - Ethereum block chain- Elements of the Ethereum block chain– 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 Hyper ledger – – History of Smart Contract – Ricardian contracts - The DAO. Hyper ledger projects – Hyper ledger as a protocol – Fabric – Hyper ledger Fabric – Saw tooth lake – Corda Architecture.

TEXT BOOKS:

1. Bashir, Mastering Block chain: 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 bit coin, First edition. Sebastopol CA: O'Reilly,2015.
2. Z. Zheng, S. Xie, H. Dai, X. Chen, and H. Wang, ‐An Overview of Block chain Technology: Architecture, Consensus, and Future Trends,‖ in 2017 IEEE International Congress on Big Data (Big Data Congress), 2017, pp.557–564.

Course Outcomes:

- Ability to apply the concepts of block chain technology.
- Ability to analyze Bit coin Crypto currency and underlying Block chain network.
- Apply knowledge of implementations of Bit coin, Ethereum and Hyper ledger to develop solutions in theappropriate domains.
- Ability to comprehend decentralization and the role of Block chain in it.
- Ability to understand Hyper ledger project and its components; critically analyze the challenges and future opportunities in Block chain technology.

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IV Year B.Tech IT –IISem **L T/P/DC3**

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(R18A1212) MIDDLEWARE TECHNOLOGIES

(Professional Elective 5)

UNIT-I

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

UNIT-II

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

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

UNIT III

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

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

UNIT IV

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

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

UNIT V

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

TEXT BOOKS :

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

REFERENCES :

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