JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
COLLEGE OF ENGINEERING (Autonomous), ANANTHAPURAMU
B.Tech (COMPUTER SCIENCE & ENGINEERING)
2017-18
COURSE STRUCTURE

I YEAR I Semester

Sl. No	Subject Code	Subject	L	T	P	C
1	17A15501	English	3	-	-	3
2	17A15101	Mathematics -I	2	2	-	3
3	17A15201	Applied Physics	3	-	-	3
4	17A10101	Environmental Studies	3	-	-	3
5	17A10301	Engineering Drawing	1	1	3	3
6	17A10501	Problem Solving & Computer Programming	3	-	-	3
7	17A15502	English Language Communication Skills Lab	-	1	3	2
8	17A15202	Applied Physics Lab	-	1	3	2
9	17A10502	Computer Programming Lab	-	1	3	2
10	17A12451	Comprehensive Objective Type Examination	-	-	-	1
		Total	**15**	**6**	**12**	**25**

I YEAR II Semester

Sl.No	Subject Code	Subject	L	T	P	C
1	17A25501	Technical Communication and Presentation Skills	3	-	-	3
2	17A25101	Mathematics -II	2	2	-	3
3	17A25102	Mathematical Methods	2	2	-	3
4	17A25301	Applied Chemistry	3	-	-	3
5	17A20501	Data Structures	2	2	-	3
6	17A20502	Digital Logic Design	2	2	-	3
7	17A25302	Applied Chemistry Lab	-	1	3	2
8	17A23501	Engineering Workshop & IT Workshop Lab	-	1	3	2
9	17A20503	Data Structures Lab	-	1	3	2
10	17A29901	Community Service (Audit)	-	-	2	-
11	17A20505	Comprehensive Objective Type Examination	-	-	-	1
		Total	**14**	**11**	**11**	**25**

II YEAR I SEMESTER

S.No	Subject Code	Subject	L	T	P	C
1	17A35401	Managerial Economics and Financial Analysis	3	-	-	3
2	17A35104	Probability and Statistics	2	2	-	3
3	17A32401	Electrical & Electronics Engineering	3	-	-	3
4	17A30501	Object Oriented Programming	2	2	-	3
5	17A30502	Computer Organization	3	-	-	3
6	17A30503	Discrete Mathematics	2	2	-	3
7	17A32402	Electrical&Electronics Engineering Lab	-	1	3	2
8	17A30504	Object Oriented Programming Lab	-	1	3	2
9	17A30507	Comprehensive Objective Type Examination	-	-	-	1
		Total	**15**	**8**	**6**	**23**

II YEAR II SEMESTER

S.No	Subject Code	Subject	L	T	P	C
1	17A40501	Operating Systems	3	-	-	3
2	17A40502	Algorithms	2	2	-	3
3	17A40503	Database Management Systems	3	-	-	3
4	17A40504	Theory of Computation	2	2	-	3
5	17A40505	Linux Programming	3	-	-	3
6	17A45101	Human Values & Professional Ethics(Audit)	2	-	-	-
7	17A40506	Algorithms Lab	-	1	3	2
8	17A40507	Database Management Systems Lab	-	1	3	2
9	17A40508	Operating Systems Lab	-	1	3	2
10	17A40509	Comprehensive Objective Type Examination	-	-	-	1
		Total	**15**	**7**	**9**	**22**

III YEAR I SEMESTER

S.No	Subject Code	Subject	L	T	P	C
1	17A55401	Management Science	3	-	-	3
2	17A50501	Web Technologies	3	-	-	3
3	17A50502	Compiler Design	2	2	-	3
4	17A50505	**Elective I** a. Data Warehousing andMining b. Computer Graphics c. Principles of Programming Languages	3	-	-	3
5	17A50503	Software Engineering	2	2	-	3
6	17A50504	Computer Networks	2	2	-	3
7	17A50506	Software Engineering &Web Technologies	-	1	3	2
8	17A50507	Data Warehousing andMining& Compiler Design Lab	-	1	3	2
9	17A59902	Skill Development Course	-	-	-	-
10	17A50508	Comprehensive Objective Type Examination	-	-	-	1
		Total	**15**	**8**	**6**	**23**

III YEAR II SEMESTER

S.No	Subject Code	Subject	L	T	P	C
1	17A60501	Data Analytics	2	2	-	3
2	17A60502	Object Oriented Analysis &Design	3	-	-	3
3	17A624501	Micro Processors & Micro controllers	3	-	-	3
4	17A60503	Artificial Intelligence	3	-	-	3
5	17A60504	**Open Elective*-I** a. Free and Open Source Software's b. Intellectual Property Rights **c.** Data Science	3	-	-	3
6	17A69901	Foreign Language (Audit)	2	-	-	-
7	17A65501	Advanced Communications Skills Lab	-	1	3	2
8	17A624502	Micro Processors & Micro controllers Lab	-	1	3	2
9	17A60505	OOAD & Data Analytics Lab	-	1	3	2
10	17A60506	Comprehensive Objective Type Examination	-	-	-	1
		Total	**16**	**5**	**9**	**22**

IV YEAR I SEMESTER

S.No	Subject Code	Subject	L	T	P	C
1	17A70501	Software Testing	3	-	-	3
2	17A70502	Mobile Application Development	2	2	-	3
3	17A70503	Design Patterns	2	2	-	3
4	17A70504	Cloud Computing	3	-	-	3
5	17A70505	**Open Elective*-II** a. Software Project Management b. Disaster Management c. Digital Marketing	3	-	-	3
6	17A70506	**Elective – II** a. Digital Forensics & Cyber Laws b. Service Oriented Architecture c. Ethical Hacking	3	-	-	3
6	17A79905	**MOOC-I (Audit)****	-	-	-	-
7	17A70507	Software Testing Lab	-	1	3	2
8	17A70508	Mobile Application Development Lab	-	1	3	2
9	17A70509	Comprehensive Objective type Examination	-	-	-	1
		Total	**13**	**6**	**6**	**23**

Note: Project Work shall initiate in IV-I Semester with a target of submission of Abstract and finalization of topic, and the evaluation of project work shall be done in IV-II Semester

*** The student should select the subject in the open elective which is not studied in previous semesters.**

****** The student can select the subject of any discipline for **MOOC-I. Edx, CourseEra, NPTEL, Swayam, Udacity.**

IV YEAR II SEMESTER

S.No	Subject Code	Subject	L	T	P	C
1	17A80501	**Elective III** a. Information & Cyber Security b. Software Architecture c. System Applications Product	3	-	-	3
2	17A80502	**Elective – IV** a. Internet of Things b. Image Processing c. High Performance Computin	3	-	-	3
3	17A80503	**Elective – V** a. Entrepreneurship Developme b. Natural Language Processing c. Machine Learning	3	-	-	3
4	17A89905	**MOOC-II(Audit)*** **	-	-	-	-
5	17A80504	Seminar	-	-	4	2
6	17A80505	Project Work	-	-	20	10
7	17A80506	Comprehensive Objective type Examination	-	-	-	1
		Total	**9**	**0**	**24**	**22**

*** The student should select the subject in the open elective which is not studied in previous semesters.**

******* The student should select the subject of discipline centric for **MOOC-II. Edx, CourseEra, NPTEL, Swayam, Udacity.**

Areas: Computer Networks, Artificial Intelligence, Software Engineering, Mobile Adhoc Networks, Sensor networks, Algorithms, Databases, Image Processing etc.,

Note: All End Examinations (Theory and Practical) are of three hours duration.

L – Theory T- Tutorial P – Practical/Drawing C – Credits

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES ******
I B.TECH – I SEMESTER(R-17)
ENGLISH
(w.e.f Academic Year 2017-18)

Subject Code	Title of the Subject	L	T	P	C
17A15501	English	3	-	-	3

COURSE OBJECTIVES	
1	To enable the students to communicate in English for academic and social purpose
2	To enable the students to acquire structures and written expressions required for their profession.
3	To develop and practice critical and evaluative reading
4	To encourage investigating questions of the humanities through rhetorical study
5	To enhance the study skills of the students with emphasis on LSRW skills

COURSE OUTCOMES	
CO1	Develop facility in responding to a variety of situations and contexts calling for purposeful shifts in voice, tone, level of formality, design, medium, and/or structure
CO2	Become effective in the use of different modes of written communication in a professional environment
CO3	Develop capacity to apply different reading methods to evaluate a mass of data on the net and to glean the necessary information
CO4	Learn and use key rhetorical concepts through analyzing and composing a variety of texts
CO5	Well trained in LSRW skills and develop communicative competence

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

SYLLABUS

UNIT –I

Chapter entitled *Humour*from "Using English"
Chapter entitled "Jagadish Chandra Bose" from New Horizons

L- Listening -Techniques - Importance of phonetics
L- Meet & Greet and Leave taking, Introducing Oneself and Others (Formal and Informal situations)
R- -Reading Strategies -Skimming and Scanning
W- Writing strategies- sentence structures
G-Parts of Speech –Noun-number, pronoun-personal pronoun, verb- analysis
V-Affixes-prefix and suffix, root words, derivatives

UNIT –II

Chapter entitled *Inspiration* from "Using English"
Chapter entitled "Dhyan Chand" from <u>New Horizons</u>

L- Listening to details
S- Apologizing, Interrupting, Requesting and Making polite conversations
R-note making strategies
W- Paragraph-types- topic sentences, unity, coherence, length , linking devices
G-Auxiliary verbs and question tags
V- synonyms-antonyms, homonyms , homophones, homographs, words often confused

UNIT –III

Chapter entitled *Sustainable Development* from "Using English"
Chapter entitled "After Twenty Years" from <u>New Horizons</u>

L- Listening to themes and note taking
S- Giving instructions and Directions, making suggestions, Accepting ideas, fixing a time and Advising
R- Reading for details -1
W- Resume and cover letter
G- Tenses – Present tense, Past tense and Future tense
V-Word formation and One-Word Substitutes

UNIT –IV

Chapter entitled *Relationships* from "Using English"
Chapter entitled "The Tiger in the Tunnel" from <u>New Horizons</u>

L- Listening to news
S- Narrating stories, Expressing ideas and opinions and telephone skills
R- Reading for specific details and Information
W- Technical Report writing-strategies, formats-types-technical report writing
G- Voice and Subject – Verb Agreement
V- Idioms and prepositional Phrases

UNIT –V

Chapter entitled Science and Humanism from "Using English"
Chapter entitled a. "Daffodils" b. "Where the mind is Without Fear" from New Horizons
L- Listening to speeches
S- Making Presentations and Group Discussions
R- Reading for Information
W- E-mail drafting
G- Conditional clauses and conjunctions
V- Collocations and Technical Vocabulary and using words appropriately

Text Books:

1. **Using English (for detailed study)** published by Orient Black Swan, 2013
2. **New Horizons (for non detailes study) published by Pearson, 2013**

References:

1. **Raymond Murphy's English Grammar with CD,** Murphy, Cambridge University Press, 2012.
2. **Every Day Dialogues in English- Robert J.Dixson, Prentice Hall of India**
3. **Communication Skills, Sanjay Kumar &Pushpalatha** Oxford University Press, 2012.
4. **A Course in Communication Skills**- KiranmaiDutt& co. Foundation Books, 2012.
5. **Current English grammar and usage-**S M Guptha, PHI, 2013.
6. **A Course in Listening and Speaking-SasiKumar.U, U.K.Cambridge**
7. **Powerful Vocabulary Builder**- Anjana Agarwal New Age International Publishers, 2011.
8. **Writing with a Purpose, Tickoo and Sasi Kumar, OUP, 2011**
9. **Oxford Advanced Learners Dictionary, 9th edition, Oxford, 2016**

Method of Evaluation:

The distribution shall be 40 marks for Internal Evaluation and 60 marks for the External Evaluation. Each Internal examination shall consist of an objective test for 10 marks and a subjective test for 20 marks with duration of 20 and 90 minutes respectively. In addition to that 10 marks will be awarded for assignment.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING******
I B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A15101	**MATHEMATICS – I**	**2**	**2**	**0**	**3**

COURSE DESCRIPTION: First order differential equation, higher order linear differential equations; functions of several variables; applications of integration; multiple integrals, vector calculus.

COURSE OBJECTIVES:

CEO 1: To impart knowledge on the advanced concepts of linear differential equations, functions of several variables, applications of derivatives, multiple integrals and vectors calculus.

CEO 2: To develop skills in analyzing the problems, designing mathematical models, skills in differentiation, integration, and vectors calculus for the problems in engineering.

COURSE OUT COMES: After completion of the course a successful student is able to

CO 1: Acquire knowledge in
- (a) Higher order Differential equations
- (b) Maximum and minimum values for the functions of several variables
- (c) Double and triple integrals
- (d) Differentiation and integration of vector functions.
- (e) Line and surface volume
- (f) Transforming integrals from three dimensional surfaces and volumes

on to plane surfaces

CO 2: Develop skills in analyzing the
- (a) methods for differential equation for obtaining appropriate solutions,
- (b) Properties of oscillatory electrical circuits and heat transfer in engineering systems
- (c) The variations in the properties of functions near their stationary values
- (d) Flow patterns of fluids, electrical and magnetic flux and related aspects

CO 3: Develop skills in designing mathematical models for
- (a) R-C and L-R-C oscillatory electrical circuits
- (b) Mechanical oscillations.
- (c) Deflection of Beams.
- (d) Heat transfer and Newton's laws of cooling
- (e) Engineering concepts involving lengths of curves and areas of planes Flux across surfaces

CO 4: Develop analytical skills in solving the problems involving
- (a) Newton's laws of cooling
- (b) non homogeneous linear differential equations
- (c) maximum and minimum values for the functions
- (d) lengths of curves, areas of surfaces and volumes of solids in engineering

(e) transformations of integrals from three dimensional surfaces and volumes on to plane surfaces

CO 5: Use relevant mathematical techniques for evaluating

(a) various types of particular integrals in differential equations
(b) stationary values for multi variable functions
(c) multiple integrals in change of variables
(d) Integrations of vector functions.

Course Outcome	Program Outcomes					Program Specific Outcomes			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	--	PSOz
CO1	H								
CO2	L	H							
CO3	M		H						
CO4	H	M		H					
CO5	M	L			H				

Correlation Levels: H - High M - Medium L - Low

UNIT-I:

FIRST ORDER DIFFERENTIAL EQUATIONS (6 periods)

Linear and Bernoulli type, exact equations and reducible to exact. Orthogonal trajectories (Both Cartesian and polar forms). Newton's law of cooling.

UNIT II:

HIGHER ORDER LINEAR DIFFERENTIALEQUATIONS(12 periods)

Method for solution of linear equations- Differential operator *D*, Solution of second order linear homogeneous equations with constant coefficients, Solution of Higher order homogeneous linear equations with constant coefficients, Solution of Non homogeneous linear equations- Operator methods for finding particular integrals- for cases – e^{ax}, sinax, cos ax, x^n, $e^{ax}V(x)$, $xV(x)$. Method of Variation of parameters. Applications of linear differential equations- Mechanical and Electrical oscillatory circuits and Deflection of Beams.

UNIT – III

Power Series Expansions &Multi-variable Calculus (8 Lectures)

Taylor series, Maclaurin series. Functions of several variables, Continuity, Partial derivatives, Total derivative, Increment theorem, Chain rule, Tangent plane and Normal line, Mixed derivative theorem, Necessary and sufficient conditions for Maxima, Minima and Saddle point, The method of Lagrange multipliers.

UNIT – IV

Multiple Integrals (6 Lectures)

Double integral, Fubini's theorem, Volumes and Areas, Change of variable in a double integral, special case: Polar coordinates, Triple integral, Applications, Change of variables in a triple integral, Surface area, Line integrals, Surface integrals.

UNIT – V

Vector Calculus (12 Lectures)

Vector functions, Continuity and Differentiability of vector functions, Arc length for space curves, Unit tangent vector, Unit normal and Curvature to plane and space curves, Gradient, Directional derivatives, Vector fields, Divergence and Curl of a vector field, vector integrations, Green's Theorem (without Proof), Stokes' Theorem(without Proof), The divergence theorem(without Proof),verifications and applications.

TEXT BOOKS:

1. Engineering Mathematics-I, E. Rukmangadachari& E. Keshava Reddy, Pearson Publisher
2. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers.

REFERENCES:

1. Engineering Mathematics Volume-I, by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad, S.Chand publication.
2. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India.
3. Higher Engineering Mathematics, by B.V.Ramana, McGraw Hill publishers.
4. Advanced Engineering Mathematics, by Alan Jeffrey, Elsevier.
5. Advanced Engineering Mathematics 3rd Edition,by R.K.Jain&S.R.K.Iyengar, Narosa publishers.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A15201	APPLIED PHYSICS	3	-	-	3

COURSE OBJECTIVES	
1	To make a bridge between the physics in school and engineering courses.
2	To evoke interest on applications of superposition effects like interference and diffraction, the mechanisms of emission of light, the use of lasers as light sources for low and high energy applications, study of propagation of light through transparent dielectric waveguides along with engineering applications.
3	To enlighten the concepts regarding the bulk response of materials to the EM fields and their analytical study in the back-drop of basic Quantum Mechanics and to provide fundamentals of de'Broglie waves, quantum mechanical wave equation and its applications
4	To get an insight into the microscopic meaning of conductivity, classical and quantum free electron models, the effect of periodic potential on electron motion, evolution of band theory to distinguish materials, basic concepts and transport phenomenon of charge carriers in semiconductors.
5	To open new avenues of knowledge in dielectric and magnetic materials which find potential in the emerging micro device applications.
6.	To give an impetus on the subtle mechanism of superconductors using the concept of BCS theory and their fascinating applications. Considering the significance of micro miniaturization of electronic devices and significance of low dimensional materials, the basic concepts of nano and smart materials, their properties and applications in modern emerging technologies are to be elicited.

COURSE OUTCOMES	
CO1	The different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fiber optics.
CO2	Basics of Electromagnetic fields are focused along with the understanding of quantum mechanical picture of subatomic world.

CO3	The discrepancies between the classical estimates and laboratory observations of electron transportation phenomena are successfully explained by free electron theory and band theory. The physical properties exhibited by materials would be lifted through the understanding of properties of semiconductors.
CO4	The dielectric and magnetic response of materials are focused.
CO5	The importance of superconducting materials, nanomaterials and smart materials along with their engineering applications are well elucidated.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

UNIT 1:PHYSICALOPTICS, LASERS AND FIBRE OPTICS

Physical Optics: Introduction to interference – Colours in thin films – Newton's Rings – Michelson interferometer – Fraunhofer diffraction due to single slit, double slit – Diffraction grating(Qualitative).

Lasers: Introduction – Characteristics of laser – Spontaneous and stimulated emission of radiation – Einstein's coefficients – Population inversion – Pumping mechanisms – Nd:YAG laser – He-Ne laser – Applications of lasers.

Fiber optics: Introduction–Principle of optical fiber –Numerical aperture and acceptance angle – V-Number - Types of optical fibers – Optical fiber communication system – Attenuation and losses in optical fibers – Applications of optical fibers.

UNIT 2:ELECTOMAGNETIC FIELDS AND QUANTUM MECHANICS

Electromagnetic Fields: Scalar and Vector Fields – Electric Potential – Gradient, Divergence of fields - Gauss and Stokes theorems - Derivations of Maxwell's equations.

QuantumMechanics: Black Body radiation – Dual nature of radiation – Schrodinger's time independent wave equation – Significance of wave function – Particle in a one dimensional infinite potential well.

UNIT 3: FREE ELECTRON THEORY AND SEMICONDUCTORS

Freeelectrontheory: Classical free electron theory – Sources of electrical resistance – Equation for electrical conductivity – Quantum free electron theory – Fermi-Dirac distribution – Kronig-Penny model (qualitative) – Origin of bands in solids – Effective mass.

Semiconductorphysics: Introduction –Direct and Indirect band gap semiconductors – Drift & diffusion currents – Einstein's equation – Continuity equation – Hall Effect.

UNIT 4: **DIELECTRICSAND MAGNETIC MATERIALS**

Dielectrics: Introduction – Dielectric Polarization – Types of Polarization – Lorentz field – Clausius-Mosotti equation – Piezoelectricity – Ferro electricity – Dielectric strength, loss and breakdown.

Magneticmaterials: Introduction – Basic definitions – Origin of magnetic moment – Classification of magnetic materials – Hysteresis – Soft and hard magnetic materials – Applications of magnetic materials.

UNIT 5: **ADVANCED MATERIALS**

Superconductors: Introduction – Properties of superconductors – Meissner effect– Type I and type II superconductors – ac and dc Josephson effects – BCS theory (qualitative) – High T_c superconductors – Applications of superconductors.

Nanomaterials: Introduction – Surface area and quantum confinement – Physical properties: optical, thermal, mechanical and magnetic – Applications of nanomaterials.

SmartMaterials: Shape Memory Alloys: Definition – Two phases – One way and two way memory effect – Pseudo elasticity – Applications of shape memory alloys.

Prescribed Text books:

1. Engineering physics – D.K. Battacharya and PoonamTandon, Oxford University press.

2. Engineering physics – M.N. Avadhanulu and P.G. KrshiSagar, Chand and Co.

Reference Books:

1. Fundamentals of Physics – Halliday, Resnick and Walker, John Wiley &Sons
2. Introduction to modern optics – Grant R Fowles
3. A text book on Optics – Brijlal&Subramanyam
4. Semiconductor physics and devices- Basic principle – Donald A, Neamen, McGraw Hill

5. Introduction to Nanotechnology – C P Poole and F J Owens, Wiley
6. Shape Memory Alloys-Modeling and Engg. Applications – C Lagoudas, Springer
7. Engineering Physics – V. Rajendran, K.Thyagarajan Tata MacGraw Hill Publishers
8. Engineering Physics – S.O.Pillai, New Age Publications
9. Engineering Physics - Sanjay D. Jain, D. Sahasrambudhe and Girish, University Press
10. Engineering Physics – D K Pandey, S. Chaturvedi, Cengage Learning
11. Engineering Physics – M. Arumugam, Anuradha Publications

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****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A10101	Environmental Studies	3	-	-	3

COURSE OBJECTIVES	
1	To make the students to get awareness on environment, to understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life to save earth from the inventions by the engineers.

COURSE OUTCOMES	
CO1	Critical Thinking: demonstrate critical thinking skills in relation to environmental affairs.
CO2	Communication: demonstrate knowledge and application of communication skills and the ability to write effectively in a variety of contexts.
CO3	Interdisciplinary Synthesis: demonstrate an ability to integrate the many disciplines and fields that intersect with environmental concerns
CO4	Ecological Literacy: demonstrate an awareness, knowledge, and appreciation of the intrinsic values of ecological processes and communities
CO5	Sustainability: demonstrate an integrative approach to environmental issues with a focus on sustainability

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓					✓		✓			✓	✓
CO2	✓		✓		✓							✓
CO3	✓		✓		✓		✓		✓	✓		
CO4		✓		✓				✓			✓	
CO5	✓		✓			✓			✓			✓

UNIT – I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES: – Definition, Scope and Importance – Need for Public Awareness.

NATURAL RESOURCES : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern

agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources:

UNIT – II

ECOSYSTEMS : Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological sucession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem.
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

BIODIVERSITY AND ITS CONSERVATION : Introduction 0 Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-soports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – III

ENVIRONMENTAL POLLUTION : Definition, Cause, effects and control measures of :

a. Air Pollution.
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

SOLID WASTE MANAGEMENT : Causes**,** effects and control measures of urban and industrial wates – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNIT – IV

SOCIAL ISSUES AND THE ENVIRONMENT : From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global

warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT – V

HUMAN POPULATION AND THE ENVIRONMENT : Population growth, variation among nations. Population explosion – Family Welfare Proggramme. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies.

FIELD WORK : Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, birds – river, hill slopes, etc..

TEXT BOOKS :

(1) Text book of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission, Universities Press.
(2) Environmental Studies by Kaushik, New Age Pubilishers.
(3) Environmental Studies by Benny Joseph, TMHPubilishers

REFERENCES :

(1) Environmental Studies by Dr.S.AzeemUnnisa, Academic Publishing Company
(2) Textbook of Environmental Science by Deeksha Dave and E.Sai Baba Reddy, CengagePubilications.
(3) Text book of Environmental Sciences and Technology by M.Anji Reddy, BS Publication.
(4) Comprehensive Environmental studies byJ.P.Sharma, Laxmi publications.
(5) Environmental sciences and engineering – J. Glynn Henry and Gary W. Heinke – Printice hall of India Private limited.
(6) Introduction to Environmental engineering and science by Gilbert M. Masters and Wendell P. Ela - Printice hall of India Private limited.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF ELECTRICAL ENGINEERING ******
I B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A10301	Engineering Drawing	1	1	3	3

COURSE OBJECTIVES	
1	To draw and understand the practical importance of geometrical constructions.
2	To understand the representation of the regular planes and solids in first angle of projections

COURSE OUTCOMES	
CO1	Student will be familiar with the BIS conventions and dimensions
CO2	Student will be familiar with the positions of points and straight lines under different cases
CO3	Student will be able to represent regular planes and solids on the drawing sheet for various cases
CO4	Student can draw the development for regular solids
CO5	Student will familiarize with the 2D and 3D projections of various figure

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

SYLLABUS
(Common to EEE, ECE and CSE).

Unit-I

Introduction to Engineering Drawing: Principles of Engineering Graphics and their significance Drawing Instruments and their Use – BIS Conventions in drawing and Lettering.
Curves used in practice:

a) Conic sections including the Rectangular Hyperbola
b) Cycloid, Epicycloid and Hypocycloid –Normals and Tangents
c) Involute of a circle –Normals and Tangents

Principles of orthographic projection, I and III angle projections –Conventions –Projections of points.

Unit –II

Projection of lines inclined to both planes –traces, Projection of plane figures inclined to both planes.

Unit –III

Projection of simple solids inclined to both planes.

Unit –IV

Sections and Developments: Sections and Sectional views of Regular solids –Prism, Cylinder, Pyramid, Cone – True shapes.

Unit –V

Isometric projections: Principles of pictorial representations-Isometric projection- Isometric scale-Isometric views- conventions- Isometric views of plane figures, solids-Isometric projection of objects with non isometric lines-Isometric projection of spherical parts.

TEXT BOOKS:

1. Engineering Drawing, N.D. Bhat, Charotar Publishers
2. Engineering Drawing, K.L. Narayana& P. Kannaih, Scitech Publishers, Chennai.

REFERENCES:

1. Engineering Drawing, Johle, Tata McGraw-Hill Publishers.
2. Engineering Drawing, Shah and Rana,2/e, Pearson Education
3. Engineering Drawing and Graphics, Venugopal/New age Publishers
4. Engineering Graphics, John&john.

Method of Evaluation:

The distribution shall be 40 marks for Internal Evaluation and 60 marks for the External Evaluation.

Internal mid examination for 30 marks and internal assessment for 10 marks shall be awarded for internal evaluation.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A10501	**Problem Solving and Computer Programming**	3	-	-	3

COURSE OBJECTIVES	
1	To understand the various steps in Program development.
2	To understand the basic concepts in C Programming Language.
3	To learn how to write modular and readable C Programs
4	To understand the basic concepts such as Abstract Data Types, Linear and Non Linear Data structures.
5	To understand the notations used to analyze the Performance of algorithms.

COURSE OUTCOMES	
CO1	Develop flowcharts, algorithms for given complex problems.
CO2	Analyze basic programming constructs.
CO3	Write C programs for real world problems.
CO4	Implement C programming by using various control structures.
CO5	Appreciate coding standards and best practices for program development.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓					✓		✓			✓	✓
CO2	✓		✓		✓							✓
CO3	✓		✓		✓		✓		✓	✓		
CO4		✓		✓				✓			✓	
CO5	✓		✓			✓			✓			✓

UNIT - I

Introduction: Programs and Programming, Programming Languages, Compiler, Interpreter, Loader and Linker, Program Execution, Classification of Programming, Structured Programming Concept, Algorithms, Flowcharts, System Developments.

Fundamentals Algorithms: Exchange the Values between two variables, Counting, Summation of set of numbers, Factorial Computation, Generation of the Fibonacci sequence, Reversing the digits of a integer.

Basics Of C: Introduction**,** Developing Programs in C, A Simple C program, Parts of C Program Revisited.

UNIT – II

Structure of C: Structure of a C Program, Concept of a Variable, Data Types in C, Program Statements, Declaration, Tokens, Operators and Expressions, Type conversion in C.

Input and Output: Introduction, Basic Screen and Keyboard I/O in C, Non-Formatted Input and Output, Formatted Input and Output Function.
Control Statements: Introduction, Specifying Test Condition for Selection and Iteration, Writing Test Expression, Conditional Execution and Selection, Iteration and Repetitive Execution. Nested Loops.

UNIT – III
Arrays And Strings: Introduction, One-Dimensional Array, Strings, Multidimensional Arrays, Arrays of Strings.
Function: Introduction, Concept of Functions, Using Functions, Call by Value Mechanism, Working with Functions, Passing Arrays to Functions, Scope and Extent, Inline Function, Recursion.

UNIT - IV
Factoring Methods: Finding Square root of a Number, The Smallest Deviser of an Interger, The GCD of Two Integers, Generating Prime Numbers.
Pointers – Introduction, Understanding Memory, Address Operator, Pointer, Void Pointer, Null Pointer, Use of pointer, Arrays and Pointers, Pointers and string, Pointers and string, Pointers to pointers, Array of pointers, Pointers to Function, Dynamic Memory Allocation.
Introduction to Data Structures, Single Linked List.

UNIT – V

User-Defined Data Types and Variables: Introduction, User-defined Data Types, Structures, Union, Enumeration Types.
Files in C: Introduction, Using Files in C, Working with text Files, Working with Binary Fields, Direct File Input and Output, Files of Records, Random Access to Files of Records.

TEXT BOOKS:

1. Programming in C, PradipDey, Manas Ghosh, Second Edition, OXFORD,
2. How to Slove it by Computer by R.G. Dromey, Pearson.

REFERENCES:

1. Programming in C and Data Structures, Jeri R. Hanly, Elliot B. Koffman, Ashok Kamthane and A.Ananda Rao, Pearson Education.
2. Value Range analysis of C programs by simon, Axel by New Age International Publishers.
3. C Programming with problem solving, J.A. Jones & K. Harrow, dreamtech Press
4. Programming in C – Stephen G. Kochan, III Edition, PearsonEductaion.
5. C for Engineers and Scientists, H.Cheng, Mc.Graw-Hill International Edition Education / PHI
6. C Programming & Data Structures,E.Balagurusamy,TMH.
7. Complete Reference – C, Herbert Schildt,TMH.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – I SEMESTER(R-17)
English Language Communication Skills Lab
(w.e.f Academic Year 2017-18)

Subject Code	Title of the Lab	L	T	P	C
17A15502	English Language Communication Skills Lab	-	1	3	2

COURSE OBJECTIVES	
1	To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
2	To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
3	To provide opportunities for practice in using English inday to day situations
4	To improve the fluency in spoken English and neutralize mother tongue influence
5	To train students to use language appropriately for debate, group discussion and public speaking

COURSE OUTCOMES	
CO1	Better Understanding of nuances of language through audio- visual experience and be independent learners
CO2	The significance of paralinguistic features will be understood by the students and they will try to be intelligible.
CO3	Become good at Inter-personal skills
CO4	Achieve neutral accent and be free from mother tongue influence
CO5	Being an active participant in debates and group discussion, showing ability to express agreement, argument to summarize ideas to elicit the views of others and present own ideas;

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

UNIT- I

Phonetics – Introduction to Sounds of Speech – Vowels – Consonants – Phonetic Transcription & Orthographic Transcription

UNIT – II

Syllabification – Word Stress – Rules of word stress – Intonation – Falling tone and Rising tone

UNIT – III

Situational Dialogues – Role-play – Expressions in various situations – Self Introduction – Introducing others – Greetings – Apologies – Requests – Giving directions -Social and Professional etiquettes – Telephone Etiquettes

UNIT – IV

JAM – Describing Pictures, Photographs, Products, and Process – Talking about Wishes- Information Transfer.

UNIT – V

Debates - Group Discussions-1

MINIMUM REQUIREMENT FOR ELCS LAB:

The English Language Lab shall have two parts:

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.

2. The Communication Skills Lab with movable chairs and audio-visual aids with a P.A. system, Projector, a digital stereo-audio & video system and camcorder etc.

System Requirement (Hardware component):

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

i) P – IV Processor
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB

ii) Headphones of High quality

SUGGESTED SOFTWARE:

1. Walden Infotech English Language Communication Skills.
2. Clarity Pronunciation Power – Part I (Sky Pronunciation)
3. Clarity Pronunciation Power – part II
4. LES by British council
5. TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
6. *DELTA's key to the Next Generation TOEFL Test: Advanced Skills Practice.*
7. Lingua TOEFL CBT Insider, by Dreamtech
8. English Pronunciation in Use (Elementary, Intermediate, Advanced) CUP
9. Cambridge Advanced Learners' English Dictionary with CD.

REFERENCE BOOKS:

1. **A Textbook of English Phonetics for Indian Students** 2nd Ed T. Balasubramanian. (Macmillian), 2012.
2. **A Course in Phonetics and Spoken English**, DhamijaSethi, Prentice-Hall of India Pvt.Ltd
3. **Speaking English Effectively**, 2nd Edition Krishna Mohan & NP Singh, 2011. (Mcmillan).
4. **A Hand book for English Laboratories**, E.Sureshkumar, P.Sreehari, Foundation Books,2011
5. **English Pronunciation in Use. Intermediate & Advanced**, Hancock, M. 2009. CUP
6. **Basics of Communication in English**, Soundararaj, Francis. 2012.. *New Delhi: Macmillan*
7. **Spoken English** (CIEFL) in 3 volumes with 6 cassettes, OUP.
8. **English Pronouncing Dictionary**, Daniel Jones Current Edition with CD.Cambridge, 17th edition, 2011.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – I SEMESTER

Subject Code	Title of the Lab	L	T	P	C
17A15202	Applied Physics Laboratory	-	1	3	2

COURSE OBJECTIVES	
1	The Objective of this course is to make the students gain practical knowledge to correlate with the theoretical studies.
2	To develop practical applications of engineering materials and use of principle in the right way to implement the modern technology.
3	To train engineering students on basis of measurements and the instruments
4	To equip the students with practical knowledge in electronic, optics, and heat experiments

COURSE OUTCOMES	
CO1	On Completion of this course, students are able to – Develop skills to impart practical knowledge in real time solution.
CO2	Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations.
CO3	Understand measurement technology, usage of new instruments and real time applications in engineering studies.
CO4	The student will be able to analyze the physical principle involved in the various instruments, also relate the principle to new application.
CO5	The various experiments in the areas of optics, mechanics and thermal physics will nurture the students in all branches of Engineering.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓					✓		✓			✓	✓
CO2	✓		✓		✓							✓
CO3			✓		✓		✓		✓	✓		
CO4		✓		✓							✓	
CO5	✓		✓			✓			✓			✓

LIST OF EXPERIMENTS

Any TEN of the following experiments have to be performed during the SEMESTER

1. Determination of wavelengths of variouscolours of mercury spectrum using diffraction grating in normal incidence method.

2. Determination of dispersive power of the prism
3. Determination of thickness of thin object by wedge method.
4. Determination of radius of curvature of lens by Newton's rings.
5. Laser : Diffraction due to single slit
6. Laser : Diffraction due to double slit
7. Laser: Determination of wavelength using diffraction grating
8. Determination of Numerical aperture of an optical fiber.
9. Meldes experiment: Determination of the frequency of tuning fork
10. Sonometer: Verification of the three laws of stretched strings
11. Energy gap of a material using p-n junction diode
12. Electrical conductivity by four probe method
13. Hall effect : Determination of mobility of charge carriers in semiconductor
14. B-H curve
15. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
16. Determination of dielectric constant and Curie temperature of a ferroelectric material.

Note: Out of 10 experiments, two experiments will be performed using virtual laboratory

Data Books Required: Nil

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING ******
I B.TECH – I SEMESTER
(LAB)

Subject Code	Title of the Lab	L	T	P	C
17A10502	**Computer Programming Lab**	-	1	3	2

COURSE OBJECTIVES	
1	To work with the compound data types
2	To explore dynamic memory allocation concepts
3	Able to design the flowchart and algorithm for real world problems
4	Able to write C programs for real world problems using simple and compound data types
5	Employee good programming style, standards and practices during program development

COURSE OUTCOMES	
CO1	Translate algorithms in to programs
CO2	Code and debug programs in C program language using various constructs.
CO3	Formulate problems and implement algorithms in C.
CO4	Able to use different data types in a computer program

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓					✓		✓			✓	✓
CO2	✓		✓		✓							✓
CO3			✓		✓		✓		✓	✓		
CO4		✓		✓							✓	

LIST OF EXPERIMENTS

Week-1
1) Write a C program to make the following exchange between the variables a-> b -> c->d - > a
2) Write a C program to carry out the arithmetic operations addition, subtraction, multiplication, and division between two variables
3) Write a C program for printing prime numbers between 1 and n.

Week-2
1) Write a C program to construct a multiplication table for a given number.
2) Write a program to reverse the digit of a given integer.
3) Write a C program to find the sum of individual digits of a positive integer.
4) Write a C program to calculate the factorial of a given number

Week-3
1) Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

2) Write a program to calculate tax, given the following conditions:

a) If income is less than 1,50,000 then no tax.
b) If taxable income is in the range 1,50,001 – 300,000 then charge 10% tax
c) If taxable income is in the range 3,00,001 – 500,000 then charge 20% tax
d) If taxable income is above 5,00,001 then charge 30% tax

Week-4

1) Write a program to print the calendar for a month given the first Week- day of the month.

Input the first day of the month (Sun=0,Mon=1,Tue=2,Wed=3,.....) :: 3

Total number of days in the month : 31

Expected output

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
-	-	-	*1*	*2*	*3*	*4*
5	*6*	*7*	*8*	*9*	*10*	*11*
12	*13*	*14*	*15*	*16*	*17*	*18*
19	*20*	*21*	*22*	*23*	*24*	*25*
25	*26*	*27*	*28*	*29*	*30*	*31*

2) Write a C program to find the roots of a quadratic equation

Week-5

1) Write a program to print the Pascal triangle for a given number
2) Write a C program to find the GCD (greatest common divisor) of two given integers
3) Write a C program to construct a pyramid of numbers.
4) Write C code to define a function cash_dispense, which takes an amount as its input, and returns the number of 1000, 500, 100, 50, 20, 10, 5, 2, 1 rupee denomination that make up the given amount

Week-6

1) Write C code to reverse the contents of the array. For example, [1,2,3,4,5] should become [5,4,3,2,1]
2) Write a C program that uses functions to perform the following:

i) Addition of Two Matrices

ii) Multiplication of Two Matrices

3) Write a program that will search and find out the position where the given key element exist in a user chosen array and print it as output.

Week-7

1) Write C code to compute the frequency table of survey responses given by 20 users. The survey responses range from 1 to 5 and are stored in an array. For example, 10 responses are stored in the array [1,1,5,2,3,3,5,5,2,2]. The frequency table will be as shown below:

a. 1 = 2
b. 2 = 3
c. 3 = 2

d. 4 = 0

e. 5 = 3

2) Write a program to define a function to sort an array of integers in ascending order by using exchange sort.

Week-8

1) Write a C program to check whether a given string is a palindrome or not, without using any built-in functions.
2) Write a C program to determine if the given string is a palindrome or not by using string functions.
3) Write a function that accepts a string and delete the first character.
4) Write a function that accepts a string and delete all the leading spaces.

Week-9 Write a program to accept a string from user and display number of vowels, consonants, digits and special characters present in each of the words of the given string.

Week-10

1) Write a C program to define a union and structure both having exactly the same numbers using the sizeof operators print the sizeof structure variables as well as union variable
2) Declare a structure *time* that has three fields *hr*, *min*, *secs.* Create two variables,*start_time*and*end_time.* Input there values from the user. Then while *start_time* is not equal to *end_time* display GOOD DAY on screen.

Week-11

1) Write a program to read in an array of names and to sort them in alphabetical order. Use sort function that receives pointers to the functions strcmp, and swap, sort in turn should call these functions via the pointers.
2) Write a program to read and display values of an integer array. Allocate space dynamically for the array using the *malloc().*
3) Write a program to calculate area of a triangle using function that has the input parameters as pointers as sides of the triangle.

Week-12

1) Two text files are given with the names text1 and text2. These files have several lines of text. Write a program to merge (first line of text1 followed by first line of text2 and so on until both the files reach the end of the file) the lines of text1 and text2 and write the merged text to a new file text3.
2) Write a program to split a given text file into n parts. Name each part as the name of the original file followed by .part<**n**> where n is the sequence number of the part file.

Reference Books:

1. Computer Science, A Structured Programming Approach Using C by Behrouz A. Forouzan& Richard F. Gilberg, Third Edition, Cengage Learning
2. C Programming A Problem-Solving Approach, Behrouz A. Forouzan& E.V. Prasad, F. Gilberg, Third Edition, Cengage Learning
3. Programming with C RemaTheraja, Oxford
4. "C Test Your Skills", Kamthane, Pearson Education
5. Programming in C: A Practical Approach, Ajay Mittal, Pearson
6. Problem solving with C, M.T.Somasekhara, PHI
7. C Programming with problem solving, J.A. Jones & K. Harrow,Dreamtech Press
8. Programming withc, Byron S Gottfried, Jitender Kumar Chhabra, TMH, 2011

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – II SEMESTER(R-17)
Technical Communication and Presentation Skills
(w.e.f Academic Year 2017-18)

Subject Code	Title of the Subject	L	T	P	C
17A25501	Technical Communication and Presentation Skills	3	0	0	3

COURSE OBJECTIVES	
1	To develop awareness in students of the relevance and importance of technical communication and presentation skills.
2	To prepare the students for placements
3	To sensitize the students to the appropriate use of non-verbal communication
4	To train students to use language appropriately for presentations and interviews
5	To enhance the documentation skills of the students with emphasis on formal and informal writing

COURSE OUTCOMES	
CO1	Become effective technical communicators
CO2	Be job-ready and able to face interviews confidently
CO3	Sensitive use of non-verbal language suitable to different situations in professional life
CO4	Learn and use keys words, phrases and sentence structures making a mark in interviews and presentation skills
CO5	Effective writing skills with the ability to use different styles for different situations

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

SYLLABUS

UNIT 1: Basics of Technical Communication – Introduction – Objectives & Characteristics of Technical Communication – Importance and need for Technical communication - LSRW Skills – Barriers to effective communication

UNIT II

Informal and Formal Conversation - Verbal and Non-verbal communication –Kinesics, Proxemics, Chronemics, Haptics, Paralanguage

UNIT III

Written communication – Differences between spoken and written communication – Features of effective writing –Advantages and disadvantages of spoken and written communication- Art of condensation- summarizing and paraphrasing

UNIT IV

Presentation Skills – Nature and importance of oral presentation – Defining the purpose – Analyzing the audience - Planning and preparing the presentation, organizing and rehearsing the presentation –Individual and group presentations - Handling stage fright

UNIT V

Interview Skills – The Interview process –Characteristics of the job interview – Pre-interview preparation techniques – Projecting the positive image – Answering Strategies

Text Books:

1. **Effective Technical Communication,** Ashrif Rizvi, TataMcGrahill, 2011
2. **Technical Communication** by Meenakshi Raman &Sangeeta Sharma,3rd Edition, O U Press 2015

References:

1.Communication Skills by Pushpalatha& Sanjay Kumar, Oxford Univsesity Press

2.Books on **TOEFL/GRE/GMAT/CAT/IELTS** by Barron's/DELTA/Cambridge University Press.2012.

3. **Soft Skills for Everyone,** Butterfield Jeff, Cengage Publications, 2011.

4. **Management Shapers Series** by Universities Press (India) Pvt Ltd., Himayatnagar, Hyderabad 2008.

5. **Successful Presentations** by John Hughes & Andrew Mallett, Oxford.

6. **Winning at Interviews** by Edgar Thorpe and Showick Thorpe, Pearson

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING******
I B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A25101	**MATHEMATICS – II**	2	2	-	3

COURSE DESCRIPTION: Fourier series; Fourier integrals and transforms; Laplace transforms; z – transforms;partial differential equations.

COURSE OBJECTIVES:

CEO 1: To impart basic knowledge on Fourier series, Fourier transforms, Laplace Transforms, z-transforms and partial differential equations.

CEO 2: To develop skills in analyzing the problems, designing mathematical models,
Fourier series, Fourier transforms, Laplace transforms, z-transforms and partial differential equations for the problems in engineering.

COURSE OUTCOMES: After completion of the course a successful student is able to

CO 1: Acquire basic knowledge in
- (a) Fourier series and Fourier transforms
- (b) Fourier integrals
- (c) Laplace transforms and their applications
- (d) z- transforms and their applications
- (e) Solving partial differential equations
- (f) Heat transfer and wave motion

CO 2: Develop skills in Analyzing the
- (a) Properties of Fourier series for a given function
- (b) Partial differential equations through different evaluation methods
- (c) Difference equations through z – transforms
- (d) Engineering systems and processes involving wave forms and heat transfer

CO 3: Develop skills in designing mathematical models for
- (a) Problems involving heat transfer and wave forms
- (b) Engineering concepts involving, Fourier transforms, Fourier integrals, Laplace transforms, z-transforms and difference equations

CO 4: Develop analytical skills in solving the problems involving
- (a) Fourier series and Fourier transforms
- (b) Laplace transforms

(c) Z-transforms and difference equations
(d) Heat transfer and wave motion

CO 5: Use relevant transformation techniques for
(a) Obtaining Fourier transforms for different types of functions
(b) Laplace transforms
(c) Z- transforms
(d) Partial differential equations

Course Outcome	Program Outcomes					Program Specific Outcomes			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	--	PSOz
CO1	H								
CO2	L	H							
CO3	M		H						
CO4	H	M		H					
CO5	M	L			H				

Correlation Levels: H - High M - Medium L – Low

UNIT- I :

FOURIER SERIES (7 periods)

Fourier series: Determination of Fourier coefficients (Euler's formulae),Fourier series of even and odd functions, convergence of Fourier series (Dirichlet conditions), Half-range Fourier sine and cosine expansions, Parseval's formula, Complex form of Fourier series.

UNIT- II:

FOURIER INTEGRALS AND FOURIER TRANSFORMS(8 periods)

Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier transform, Fourier sine and cosine transforms –properties, Inverse transform and finite Fourier transforms.

UNIT-III:

LAPLACE TRANSFORMS (12 periods)

Laplace transforms of standard functions. Properties of Laplace transform. First and second shifting Theorems. Laplace transforms of derivatives and integrals. Inverse transforms. Convolution theorem, inverse Laplace transforms by convolution theorem. Laplace transform of periodic functions, Step and Impulse functions, Applications of Laplace transforms to ordinary differential equations of first and second order with constant coefficients.

UNIT-IV :

Z- TRANSFORMS (9 periods)

Z – transforms, inverse Z– transforms, damping rule, shifting rule, initial and final value theorems. Convolution theorem, Solution of difference equations by Z– transforms.

UNIT – V :

PARTIAL DIFFERENTIAL EQUATIONS (9 periods)

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions ,Method of separation of variables , Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace's equation under initial and boundary conditions.

TEXT BOOKS:

1. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers.
2. Engineering Mathematics, Volume - II, E. Rukmangadachari Pearson Publisher.

REFERENCES:

1. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad S. Chand publication.
2. Higher Engineering Mathematics, by B.V.Ramana, McGraw Hill publishers.
3. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India.
4. Advanced Engineering Mathematics 3rd Edition,by R.K.Jain&S.R.K.Iyengar, Narosa publishers

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A25102	**Mathematical Methods**	2	2	-	3

COURSE DESCRIPTION:
Fundamentals of matrix theory;numerical solutions of equations curve fitting; interpolation; numerical differentiation and integration;numerical solutions of ordinary differential equations.

COURSE OBJECTIVES:

CEO 1:To impart basic knowledge on ranks of matrices, systems of linear equations,numerical methods to solve algebraic and transcendental equations,differential equations, numerical differentiation and integration.

CEO 2:To develop skills in analyzing various numerical techniques, designing mathematical models, numerical techniques for engineering problems and
fitting of curves toexperimentaldata.

COURSE OUTCOMES: After completion of the course a successful student is able to

CO 1 :Acquire basic knowledge in
(a) Finding the rank of matrices and analyzing them.
(b) Solving algebraic and transcendental equations by various numerical methods.
(c) Fitting of various types of curves to the experimental data.
(d) Estimating the missing data through interpolation methods.
(e) Identification of errors in the experimental data
(f) Finding the values of derivatives and integrals through various numerical methods.
(g) Solving differential equations numerically when analytical methods fail to hold.

CO 2 :Develop skills in analyzing the
(a) Methods of interpolating a given data
(b) Properties of interpolating polynomials and derive conclusions
(c) Properties of curves of best fit to the given data
(d) Algebraic and transcendental equations through their solutions
(e) Properties of functions through numerical differentiation and integration
(f) Properties of numerical solutions of differential equations

CO 3 :Develop skills in designing mathematical models for

(a) Fitting geometrical curves to the given data
(b) Solving differential equations
(c) Constructing polynomials to the given data and drawing inferences.

CO 4 :Develop numerical skills in solving the problems involving
(a) Systems of linear equations
(b) Fitting of polynomials and different types of equations to the experimental data
(c) Derivatives and integrals
(d) Ordinary differential equations

CO 5 : Use relevant numerical techniques for
(a) Diagonalising the matrices of quadratic forms
(b) Interpolation of data and fitting interpolation polynomials
(c) Fitting of different types of curves to experimental data
(d) Obtaining derivatives of required order for given experimental data

Course Outcome	Program Outcomes					Program Specific Outcomes			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	--	PSOz
CO1	H								
CO2	L	H							
CO3	M		H						
CO4	H	M		H					
CO5	M	L			H				

Correlation Levels: H - High M - Medium L - Low

UNIT–I :

MATRIX THEORY (11 periods)

Rank of a matrix, echelon form, normal form, inverse of a matrix by elementary row operations. Solutions of linear system of equations. Eigen values, Eigen vectors and properties,Diagonalization.Quadratic form, reductions to canonical form using orthogonal transformation method and nature of Quadratic forms.

UNIT-II

NUMERICAL SOLUTIONS OF EQUATIONS AND CURVE FITTING (9 periods)

Solutions of Algebraic and Transcendental equations by Regulafalsi method, Newton – Raphson's method. Solution of linear simultaneous equation: Crout'striangularisation method, Gauss - Seidal iteration method.Curve fitting by the principle of least squares, fitting of a straight line, parabola and exponential curves.

UNIT- III

INTERPOLATION (7 periods)

Interpolation, difference operators and their relationships, Newton's forward and backward interpolation formulae, Lagrange's interpolation formula. Gauss forward and backward formula, Stirling's formula, Bessel's formula.

UNIT-IV

NUMERICAL DIFFERENTIATION AND INTEGRATION(7 periods)

Numerical differentiation using Newton's forward and backward formulae. Numerical integration using Trapezoidal rule, Simpsons $1/3^{rd}$ rule and $3/8^{th}$ rule.

UNIT- V

NUMERICAL SOLUTIONS OF DIFFERENTIAL EQUATIONS(11 periods)

Numerical solutions of first order Initial value problems using Taylor series method, Euler's, modified Euler's, Runge – Kutta method (4^{th} order only) and Milne's predictor – corrector method. Numerical solutions of Laplace equation using finite difference approximation.

TEXT BOOKS:

1. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers.
2. Introductory Methods of Numerical Analysis, S.S. Sastry, PHI publisher.

REFERENCES:

1. Engineering Mathematics, Volume - II, E. Rukmangadachari Pearson Publisher.
2. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad, S. Chand publication.
3. Higher Engineering Mathematics, by B.V.Ramana, McGraw Hill publishers.
4. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India.
5. Advanced Engineering Mathematics 3^{rd} Edition,by R.K.Jain&S.R.K.Iyengar, Naros a publishers

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
I B.TECH – IISEMESTER((THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A25301	Applied Chemistry	3	-	-	3

COURSE OBJECTIVES	
1	The Applied Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial/engineering applications.
2	The main aim of the course is to impart in-depth knowledge of the subject and highlight the role of chemistry in the field of engineering.
3	The lucid explanation of the topics will help students to understand the fundamental concepts and apply them to design engineering materials and solve problems related to them. An attempt has been made to logically correlate the topic with its application.
4	The extension of fundamentals of electrochemistry to energy storage devices such as commercial batteries and fuel cells is one such example.

COURSE OUTCOMES	
CO1	After the completion of the course, the student would understand about the concepts of chemistry in respect of Electrochemical cells, fuel cells, mechanism of corrosion and factors to influence, polymers, nanomaterials with their applications and engineering materials.
CO2	Understand the electrochemical sources of energy
CO3	Understand industrially based polymers, various engineering materials.
CO4	Differentiation and uses of different kinds of photochemical reactions.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

SYLLABUS

UNIT 1 :ELECTROCHEMISTRY

i) Review of electrochemical cells, Numerical calculations.

Batteries: Rechargeable batteries: Lead acid, Ni-Cd, Lithium Ion Batteries, Super capacitors Fuels cells: Fuel cell working principle, classification of fuel cells-Hydrogen-Oxygen and Methanol-Oxygen.

ii) Electrochemical sensors: Potentiometric Sensors and voltammetric sensors. Examples : analysis of Glucose and urea

iii) Corrosion: Definition, types of corrosion, Electrochemical Theory of corrosion, Factors affecting the corrosion. Prevention: Anodic and catholic protection and electro and electroless plating. (10h)

UNIT 2: POLYMERS

i) Introduction to polymers, Polymerization process, mechanism: cationic, anionic, free radical and coordination covalent.

Elastomers: Natural Rubber, process of natural rubber, vulcanization, Compounding of Rubber

Synthetic Rubber: Preparation, properties and engineering applications of Buna-S, Buna-N, Polyurethene, Polysulfide (Thiokol) rubbers

Plastomers: Thermosetting and Thermoplatics, Preparation, properties and Engineering applications, PVC, Bakelite, nylons. Polydispersive index

ii)Conducting polymers: Mechanism, synthesis and applications of polyacetyline, polyaniline.

iii) Liquid Crystals: Introduction, classification and applications

iii)Inorganic Polymers: Basic Introduction, Silicones, Polyphospazins (-(R)2-P=N-) applications.(12h)

UNIT 3: FUEL TECHNOLOGY

i) Classifications of Fuels – Characteristics of Fuels- Calorific Value – Units, Numerical Problems.

Solid Fuels–Coal, Coke : Manufacture of Metallurgical Coke by Beehive oven and Otto Hoffmann's by product ovenprocesses.

ii) Liquid Fuels:Petroleum: Refining of Petroleum, Gasoline: Octane and cetane number, Synthetic Petrol: Bergius Processes, Fischer Troph's synthesis

Power Alcohol: Manufacture, Advantages and Disadvantages of Power Alcohol

iii) Gaseous Fuels:Origin, Production and uses of Natural gas, Producer gas, Water gas, Coal gas and Biogas. Flue Gas analysis by Orsat's apparatus.

Combustion: reaction of combustion and related problems.

iv)Nuclear Fuels: Controlled and uncontrolled reactions. Breeder reactor and Power reactors. (12h)

UNIT 4: CHEMISTRY OF ENGINEERING MATERIALS

i) Electrical Insulators or Dielectric materials: Definition and classification, Characteristics of electrical insulators. Applications of electrical insulating materials (Gaseous, liquid and solid insulators)

ii) Semiconducting and Super Conducting materials-Principles and some examples

iii) Magnetic materials – Principles and types of magnetic materials-examples (9h)

UNIT5 :NANOCHEMISTRY& COMPOSITE MATERIALS

i) Nanochemistry Introduction, nanomaterials, nanoparticles,
nanostructure, supramolecular systems, nanotechnology applications, future perspective.
ii) Composite Materials: Classification of Composites materials, Constituents of Composite materials. Disperse Phase composite materials.

Glass fibre reinforced polymer composite and Carbon fibre reinforced polymer composite materials. Advantages and applications of Composites.

Text Books:

1. Engineering Chemistry by KNJayaveera, GVSubba Reddy and C. Ramachandraiah, McGraw Hill Higher Education, Foruth Edition, New Delhi.
2. A Text Book of Enigneering Chemistry, Jain and Jain, DhanapathiRai Publications, New Delhi

References:

1. A Text book of Engineering Chemistry by SS Dhara, S. Chand Publications, New Delhi
2. Engineering Chemistry by K.B.ChandraSekhar, UN.Das and Sujatha Mishra, SCITECH Pubblications India Pvt Limited.
3.Concepts of Engineering Chemistry- AshimaSrivastavaf and N.N. Janhavi
4. Text Book of Engineering Chemistry – C. Parameswara Murthy, C.V.Agarwal and Andra Naidu
5. Chemistry of Engineering Materials, C.V.Agarwal, C.Parameswaramurthy and Andranaidu
6. Text Book of Engineering Chemistry, Shashichawla, Dhanapathirai Publications.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A20501	**Data Structure**	2	2	-	3

COURSE OBJECTIVES	
1	To design and implementation of various basic and advanced data structures
2	To introduce various techniques for representation of the data in the real world
3	To teach efficient storage mechanisms of data for an easy access.

COURSE OUTCOMES	
CO1	Students will be able to apply concepts learned in various domains like DBMS, compiler construction etc.
CO2	Students will be able to use linear and non-linear data structures like stacks, queues , linked list etc
CO3	Student will be able to choose appropriate data structure as applied to specified problem definition.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓

Unit-1

Introduction and overview: Definition- Terminology- One Dimensional array- Multi Dimensional array- pointer arrays.

Linked lists: Definition- Singly linked list- - Doubly linked list -Circular linked list - Circular Double linked list- Applications of linked lists.

Unit-2

Stacks: Introduction- Definition- Operations on Stacks-Applications of Stacks.

Queues: Introduction, Definition-Representations of Queues- Various Queue Structures-Applications of Queues, Difference between the Stack and Queue .**Tables**: Hash tables.

Unit-3

Trees: Basic Terminologies- Definition and Concepts- Representations of Binary Tree-Operations on Binary Tree-Types of Binary Trees-Binary Search Tree, Heap Trees, Height Balanced Trees, AVL Trees, Red Black Trees.

Graphs: Introduction- Graph terminologies- Representation of graphs- Operations on Graphs-Applications of Graph Structures: Shortest path problem- topological sorting.

Unit-4

Sorting : Sorting Techniques- Sorting by Insertion: Straight Insertion sort- List insertion sort- Binary insertion sort- Sorting by selection: Straight selection sort- Heap Sort- Selection Sort Efficiency- Insertion Sorts: Straight Insertion Sort- Shell Sort- Insertion Sort Efficiency. Exchange Sort: Bubble Sort- Quick Sort- Exchange Sort Efficiency. External Sorts: Merging Order Files-Merging Unorder Files- Sorting Process.

Unit-5

Searching: List Searches- Sequential Search- Variations on Sequential Searches- Binary Search- Analyzing Search Algorithm- Hashed List Searches- Basic Concepts- Hashing Methods- Collision Resolutions- Open Addressing- Linked List Collision Resolution- Bucket Hashing- - B-Trees-Operations on a B Tree.

Text Books:

1. "Classic Data Structures", Second Edition by DebasisSamanta, PHI. (Units 1,2,3)
2. "Data Structures A Pseudo code Approach with C", Second Edition by Richard F. Gilberg, Behrouz A. Forouzan, Cengage Learning. (Units 4,5)

Reference Books:

1. Fundamentals of Data Structures in C – Horowitz, Sahni, Anderson-Freed, Universities Press, Second Edition.
2. Schaum' Outlines – Data Structures – Seymour Lipschutz – McGrawHill- Revised First Edition

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
I B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A20502	**Digital Logic Design**	2	2	-	3

COURSE OBJECTIVES	
1	Acquire the skills to manipulate and examine Boolean algebraic expressions, logical operations, Boolean functions and their simplifications.
2	Understand the fundamental principles of digital design.
3	Acquaint with classical hardware design for both combinational and sequential logic circuits

COURSE OUTCOMES	
CO1	Able to interpret, convert and represent different number systems and binary arithmetic.
CO2	Able to design sequential and combinational circuits.
CO3	Able to design different units of a digital computer

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓					✓		✓			✓	✓
CO2		✓		✓			✓			✓		✓
CO3	✓		✓		✓		✓		✓	✓		

Unit - I :

Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Compliments, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.
Boolean Algebra And Logic Gates: Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates, Integrated Circuits

Unit – II:

Gate – Level Minimization: The Map Method, Four Variable Map, Five-Variable Map, Product of Sums Simplification, Don't-Care Conditions, NAND and NOR Implementation, Other Two Level Implementations, EX-OR Function, Other Minimization Methods

Unit – III :

Combinational Logic: Combinational Circuits, Analysis Procedure, Design Procedure, Binary

Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers

Unit – IV :

Synchronous Sequential Logic: Sequential Circuits, Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure, Registers, Shift Registers, Ripple Counters, Synchronous Counters, Other counters

Unit – V :

Memory And Programmable Logic: Random access memory, memory decoding, Error Detection and Correction, Read-only Memory, Programmable Logic Array, Programmable Array Logic.
Digital Logic Circuits: RTL and DTL Circuits,Transistor-Transistor Logic (TTL), Emitter-Coupled Logic (ECL), MOS, CMOS Logic, Comparisons of Logic Families

Text Books :

1. "Digital Design", M.Morris Mano, Micheal D. Ciletti, Pearson, 5th Edition, 2015.

References :

1. "Digital Principles and applications", Donald P Leach, Albert Paul Malvino, GoutamSaha. McGrawHill , 8th Edition,2015.
2. Digital Logic & State Machine Design, David J. Comer, Oxford University Press, 3rd Reprinted Indian Edition, 2012
3. Digital Logic Design, R.D. Sudhakar Samuel, Elsevier

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
I B.TECH – II SEMESTER

Subject Code	Title of the Lab	L	T	P	C
17A25302	Applied Chemistry lab	-	1	3	2

COURSE OBJECTIVES	
1	Will learn practical understanding of the redox reaction
2	Will able to understand the function of fuel cells, batteries and extend the knowledge to the processes of corrosion and its prevention
3	Will learn the preparation and properties of synthetic polymers and other material that would provide sufficient impetus toengineer these to suit diverse applications
4	Will also learn the hygiene aspects of water would be in a position to design methods to produce potable water using modern technology

COURSE OUTCOMES	
CO1	Would be confident in handling energy storage systems and would be able combat chemical corrosion
CO2	Would have acquired the practical skill to handle the analytical methods with confidence.
CO3	Would feel comfortable to think of design materials with the requisite properties
CO4	Would be in a postion to technically address the water related problems.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

LIST OF EXPERIMENTS

1. Determination of total hardness of water by EDTA method.
2. Determination of Copper by EDTA method.
3. Estimation of Dissolved Oxygen by Winkler's method
4. Determination of Copper by Iodometry
5. Estimation of Iron (II) using diphenylamine indicator (Dichrometry – Internal indicator method).
6. Determination of Acidity and Alkalinity of Water
7. Determination of pH of various water samples.

8. Preparation of Phenol-Formaldehyde (Bakelite)
9. Determination of Viscosity of oils using Redwood Viscometer I
10. Determination of Viscosity of oils using Redwood Viscometer II
11. Conductometric titration of strong acid Vs strong base (Neutralization titration).
12. Conductometric titration of Barium Chloride vs Sodium Sulphate (Precipitation Titration)
13. Determination of Corrosion rate and inhibition efficiency of an inhibitor for mild steel in hydrochloric acid medium.
14. Estimation of Chloride ion using potassium Chromite indicator (Mohrs method)

TEXT BOOKS:

1. Vogel's Text book of Quantitative Chemical Analysis, Sixth Edition – J. Mendham et al, Pearson Education.
2. Chemistry Practical – SM Enterprises Lab Manual by Chandra Sekhar, GV Subba Reddy and Jayaveera.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING ******
I B.TECH – II SEMESTER

Subject Code	Title of the Lab	L	T	P	C
17A23501	Engineering & IT Workshop	-	1	3	2

COURSE OBJECTIVES	
1	The objective of this subject is to provide the basic concepts about the engineering workshop trades like Carpentry, Fitting etc.
2	Gain knowledge of the use of various workshop tools and make models in the respective trades.
3	Exposure to power tools

COURSE OUTCOMES	
CO1	Student will be aware of the safety aspects in using the tools
CO2	Student will be able to use the tools for the preparation of models in respective trades of engineering workshop.
CO3	Precautions in making the models will be known by the student.
CO4	Student will be aware of the usage of the power tools for various purposes.
CO5	Knowledge about the measuring instruments will be achieved.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓		✓		✓		✓		✓		✓	
CO2	✓		✓		✓		✓		✓		✓	
CO3	✓		✓		✓		✓		✓		✓	✓
CO4					✓		✓				✓	
CO5		✓		✓		✓						✓

1. TRADES FOR EXERCISES:

At least 2 Exercises in each of the following trades :

1. Carpentry
2. Fitting
3. House-wiring
4. Black Smithy
5. Tin smithy
6. Power Tools Demonstration

TEXT BOOK:

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ Scitech Publishers.

Subject Code	Title of the Lab	L	T	P	C
17A23501	Engineering & IT Workshop	-	1	3	2

COURSE OBJECTIVES	
1	To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations
2	To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer for use by installing the operating system
3	To learn about Networking of computers and use Internet facility for Browsing and Searching

COURSE OUTCOMES	
CO1	Disassemble and Assemble a Personal Computer and prepare the computer ready to use
CO2	Prepare the Documents using Word processors and Prepare spread sheets for calculations using excel
CO3	Prepare Slide presentations using the presentation tool
CO4	Interconnect two or more computers for information sharing
CO5	Access the Internet and Browse it to obtain the required information

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓		✓		✓		✓		✓		✓	
CO2	✓		✓		✓		✓		✓		✓	
CO3	✓		✓		✓		✓		✓		✓	✓
CO4					✓		✓				✓	
CO5		✓		✓		✓						✓

Preparing your Computer

Task 1: Learn about Computer: Identify the internal parts of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.

Task 2: Assembling a Computer: Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods

available (eg: beeps). Students should record the process of assembling and trouble shooting a computer.

Task 3: Install Operating system: Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.

Task 4: **Operating system features**: Students should record the various features that are supported by the operating system(s) installed. They have to submit a report on it. Students should be able to access CD/DVD drives, write CD/DVDs, access pen drives, print files, etc. Students should install new application software and record the installation process.

Networking and Internet

Task 5: Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimpling activity, logical configuration etc should be done by the student. The entire process has to be documented.

Task 6: Browsing Internet: Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail account and send email. They should get acquaintance with applications like Facebook, skype etc.

If Intranet mailing facility is available in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student. Students are expected to submit the information about different browsers available, their features, and search process using different natural languages, and creating e-mail account.

Task 7: Antivirus: Students should download freely available Antivirus software, install it and use it to check for threats to the computer being used. Students should submit information about the features of the antivirus used, installation process, about virus definitions, virus engine etc.

Productivity tools

Task 8: Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the colour, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

Task 9: Spreadsheet: Students should be able to create, open, save the application documents and format them as per the requirement.Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet

application considered.

Task 10: Presentations: creating, opening, saving and running the presentations, Selecting the style for slides, formatting the slides with different fonts, colours, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

References:

1. Introduction to Computers, Peter Norton, McGraw Hill
2. MOS study guide for word, Excel, Powerpoint& Outlook Exams", Joan Lambert, Joyce Cox, PHI.
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. Networking your computers and devices, Rusen, PHI
5. Trouble shooting, Maintaining & Repairing PCs", Bigelows, TMH

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING ******
I B.TECH – II SEMESTER
(LAB)

Subject Code	Title of the Lab	L	T	P	C
17A20503	**Data Structures Lab**	-	1	3	2

COURSE OBJECTIVES	
1	To write and execute programs in C to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.
2	To write and execute write programs in C to implement various sorting and searching Methods Exemplify and implement how abstract data types such as stack, queue and linked list can be implemented to manage the memory using static and dynamic allocations
3	Understand and distinguish the conceptual and applicative differences in trees, binary trees, and binary search trees
4	Examine and analyze why self-balancing trees are necessary in real world dynamic applications
5	Develop and compare the comparison-based search algorithms and sorting algorithms

COURSE OUTCOMES	
CO1	Be able to design and analyze the time and space efficiency of the data structure ·
CO2	Be capable to identity the appropriate data structure for given problem
CO3	Ability to summarize searching and sorting techniques
CO4	Ability to describe stack, queue and linked list operation.
CO5	Ability to have knowledge of tree and graphs concepts.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓		✓				✓		✓		✓	✓
CO2	✓		✓		✓		✓		✓		✓	
CO3	✓		✓		✓		✓		✓		✓	✓

CO4	✓		✓		✓		✓		✓		✓	
CO5	✓		✓		✓		✓		✓		✓	

Week 1

a) Write a Program to Implement Stack Operations by using Array and Linked Lists.
b) Write a Program to implement the operations of Singly Linked Lists.
c) Write a Program to implement the operations of doubly Linked Lists.
d) Write a Program to implement the operations of Circular Linked Lists.

Week 2

a) Write a C program that uses stack operations to convert a given infix expression into ItsPostfix
b) Write a Program to Implement Queue Operations by using Array and Linked Lists.
c) Write a Program to implement factorial of n using stack.

Week 3

Write a Program to Implement Circular Queue operations by using array and linked list. Structures.

Week 4

a) Write a Program to Sort the set of elements: (i.e., numbers or strings)
i). Quick Sort ii). Heap Sort. iii). Merge Sort
b) Write a Program to Sort the set of elements by usingExternal sorting algorithms
i). Shell Sort ii). Linear Sort. iii). Binary Sort iv) Fibonacci sort

Week 5

Write a Program to Implement the Binary Search Tree Operations.

Week 6

Write a Program to Perform the Tree Traversal Techniques by using the Iterative Method

Week 7

Write C programs for implementing the following graph traversal algorithms:
a)Depth first traversal b)Breadth first traversal

.

Week 8

Write a Program to implement all functions of a Dictionary by using Hashing

Week 9

Write a Program to Implement Skip List Operations.

Week 10

Write a Program to Implement Insertion, Deletion and Search Operations on SPLAY Trees.

Week 11

Write a program to Implement Insertion and Deletion Operations on AVL Trees

Week 12

a) Write a Program to Implement Insertion and Deletion Operations on B – Trees.
b) Write a Program to Implement Hashing methods, collision resolution techniques.
c) Write a Program to implement string operations using Stack/Queue.

Note: Use Classes and Objects to implement the above programs.

Reference Books:

1. Object Oriented Programming with ANSI & Turbo C++, Ashok N.Kamthane, Pearson Education
2. Data Structures using C++, D.S.Malik, 2nd Edition, Cengage Learning
3. Data Structures through C++, YashavantP.Kanetkar, BPB Publication
4. Data Structures using C and C++, YedidyahLangsam.MosheJ.Augenstein Aaron M.Tenenbaum, 2nd Edition,PHI
5. Data Structures using C & C++, Rajesh K.Shukla, Wiley-India
6. ADTs, Data Structures and Problem Solving with C++, Larry Nyhoff, Pearson

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – I SEMESTER (R17)
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(w.e.f academic year 2017-18)

Subject Code	Title of the Subject	L	T	P	C
17A35401	**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**	3	0	0	3

COURSE OBJECTIVES	
1	The objective of this course is to inculcate the basic knowledge to the students with the concepts of Economics & Demand to make them effective business decision makers.
2	To understand fundamentals of Production & Cost Concepts which is an important subject helps to the Technocrats to take certain business decisions in the processes of optimum utilization of resources.
3	To know the various types of Market Structures & pricing methods and its strategies & Trade Blocks.
4	To give an overview on investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
5	To provide fundamental skills about accounting and to explain the process of preparing accounting statements & analysis for effective business decisions.

COURSE OUTCOMES	
CO1	Capable of analyzing fundamentals of Economics such as Demand, Elasticity & Forecasting methods
CO2	To apply production, pricing & supply concepts for effective business administration
CO3	Students can able to identify the influence of various markets, the forms of business organization and its International Economic Environment.
CO4	Analyze how to invest adequate amount of capital in order to get maximum return from selected business activity.
CO5	Prepare and analyze accounting statements like income & expenditure statement, balance sheet apart from the fundamental knowledge, to understand financial performance of the business and to initiate the appropriate decisions to run the business profitably.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

SYLLABUS

UNIT I: **INTRODUCTION TO MANAGERIAL ECONOMICS&DEMAND**

Managerial Economics – Definition- Nature- Scope - Contemporary importance of Managerial Economics - Demand Analysis: Concept of Demand-Demand Function - Law of Demand - Elasticity of Demand- Significance - Types of Elasticity - Measurement of Elasticity of Demand - Demand Forecasting- Factors governing Demand Forecasting- Methods of Demand Forecasting -Relationship of Managerial Economics with Financial Accounting and Management.

UNIT II: **THEORY OF PRODUCTION AND COST ANALYSIS**

Production Function- Least cost combination- Short-run and Long- run Production Function- Isoquants and Isocosts, MRTS - Cobb-Douglas Production Function - Laws of returns - Internal and External Economies of scale – **Cost& Break Even Analysis**: Cost concepts and Cost behavior- Break-Even Analysis (BEA) -Determination of Break Even Point (Simple Problems)-Managerial significance and limitations of Break- Even Analysis.

UNIT III: **INTRODUCTION TO MARKETS AND NEW ECONOMIC ENVIRONMENT**

Market structures: Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition- Monopoly-Monopolistic Competition-Oligopoly-Price-Output Determination - Pricing Methods and Strategies-Forms of Business Organizations- Sole Proprietorship- Partnership – Joint Stock Companies - Public Sector Enterprises – New Economic Environment- Economic Liberalization – Privatization - Globalization- Trade Blocks (SAARC,EU,NAFTA,BRICS)-EXIM Policy-International Economic Environment.

UNIT IV: **CAPITAL AND CAPITAL BUDGETING**

Concept of Capital - Significance, Types of Capital- Components of Working Capital -Sources of Shot term and Long term Capital - Estimating Working Capital Requirements – Cash Budget- **Capital Budgeting** – Features of Capital Budgeting Proposals – Methods and Evaluation of Capital Budgeting Projects – Pay Back Method – Accounting Rate of Return (ARR) – Net Present Value (NPV) – Internal Rate Return (IRR) Method (simple problems)

UNIT V: **INTRODUCTION TO FINANCIAL ACCOUNTING AND ANALYSIS**

Accounting Concepts and Conventions-Introduction Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).***Financial Analysis*:** Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios-Du Pont Chart.

Text Books:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2013.

2. Ahuja H.L Managerial economics. S.Chand, 3/e, 2013

References:

1. Aryasri: Managerial Economics and Financial Analysis, 4/e, TMH, 2013
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International,. 2013.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage, 2013.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A35104	**PROBABILITY AND STATISTICS**	2	2	-	3

COURSE DESCRIPTION: Random variables; mathematical expectations; probability distributions; correlation and regressions; statistical quality control; sampling distributions; tests for small and large samples and their significances.

COURSE OBJECTIVES:

CEO 1 :To impart knowledge on random variables, probability distributions, sampling theory,statistical quality control and Queing models.

CEO 2 : To develop skills in analyzing the data designing of statistical models, skills' in mathematical expectations, probability distributions, testing of hypothesis, significance, statistical quality control for problems in engineering.

COURSE OUTCOMES: After completion of the course, a successful student is able to:

CO 1 :Acquire basic knowledge in
- (a) Probability distributions, correlation and regressions
- (b) Statistical quality control and testing of hypotheses
- (c) Simple linear regression
- (d) Tests of significance for small and large samples

CO 2 :Develop skills for analyzing the data with
- (a) Mathematical expectations for realistic results
- (b) Probability distributions for practical situations.
- (c) Control charts of statistical quality control
- (d) Correlation and regression concepts
- (e) Suitable tests of significance for practical situations.

CO3 : Develop skills in designing
- (a) Probability distributions
- (b) Limitations of statistical quality control
- (c) control charts,
- (d) X, R, np, and c charts

CO 4 :Develop analytical skills forsolvingproblems involving
- (a) Probability distributions, means,variances and standard deviations
- (b) Statistical techniques employed for quality
- (c) Sampling techniques for decision making
- (d) Tests of significances for small and large samples

CO 5 : Use relevant probability and statistical techniques for

(a) Mathematical expectations of desired results
(b) Fitting probability distributions for experimental data.
(c) Quality control and testing of hypothesis.
(d) Formation of queues and their properties.

Course Outcome	Program Outcomes					Program Specific Outcomes			
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	--	PSOz
CO1	H								
CO2	L	H							
CO3	M		H						
CO4	H	M		H					
CO5	M	L			H				

Correlation Levels: H - High M - Medium L - Low

UNIT - I:

Random variable and Distributions(9 periods)

Random Variables: Discrete and Continuous random variables, Distribution function of random variable, Properties, Probability mass function, Probability density function, Mathematical Expectation- Mean and Variance. Distribution functions. Binomial and poison distributions Normal distribution – correlation and linear regressions- Related properties.

UNIT – II

Testing of Hypothesis and Large Samples(9 periods)

Test of Hypothesis: Population and Sample - Statistical hypothesis - Null and Alternative Hypothesis, Type I and II errors, Level of Significance, Critical region, Degrees of freedom.Test of significance - Test of Significance for Single Proportion, Difference of Proportions, Single Mean, Difference of Means.

UNIT – III

Small Sample Tests(9 periods)

Small samples - t- test for one sample and two sample problem and paired t-test, F-test and Chi-square test for testing of goodness of fit. Contingency table, Chi-Square Test for Independence of Attributes.

UNIT – IV

Statistical quality control (9 periods)

Statistical Quality Control: Concept of quality of a manufactured product -Defects and Defectives - Causes of variations - Random and assignable - The principle of Shewhart Control Chart-Charts for attribute and variable quality characteristics- Constructions and operation of $\overline{X}$ - Chart, R-Chart,

p - Chart and C-Chart.

UNIT – V

Queuing Theory (9 periods)

Queuing Theory: Pure Birth and Death process, M/M/1 & M/M/S & their related simple problems.

TEXT BOOKS:

1. Probability & Statistics by E. Rukmangadachari & E. Keshava Reddy, Pearson Publisher.
2. Probability & Statistics for engineers by Dr. J. Ravichandran WILEY-INDIA publishers.

REFERENCES:

1. Probability & Statistics by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad, S.Chand publications.
2. Statistical methods by S.P. Gupta, S.Chand publications.
3. Probability & Statistics for Science and Engineering by G.Shanker Rao, Universities Press.
4. Probability and Statistics for Engineering and Sciences by Jay L.Devore, CENGAGE.
5. Probability and Statistics by R.A. Jhonson and Gupta C.B.
6. Fundamentals of Statistics. 7th Revived Edition by S.C Gupta, Himalaya Publishing House.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A32401	**Electrical & Electronics Engineering**	3	-	-	3

PART – A

ELECTRICAL ENGINEERING

Course Objectives:

To make the students learn about:

1	The basics of AC & DC Circuits, DC generators &motors.
2	The construction and operation of Transformers, Induction motors and their performance aspects will be studied.

Course Outcomes:

After completing the course, the student should be able to :

CO1	Analyze the basics of AC & DC Circuits and know the performance characteristics of DC generators &motors.
CO2	Gets a thorough knowledge on Transformers, Induction motors & Alternators with which he/she can able to apply the above conceptual things to real-world problems and applications.

Mapping of Course outcomes with Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	1	1	-	1	-	-	1	-	2
CO2	2	2	2	1	1	-	1	-	-	1	-	2

The course outcomes of each core course are mapped to the program outcomes with a level of emphasis being either strongly correlated (2) and moderately correlated (1).

Syllabus:

UNIT – I Introduction to DC & AC Circuits

Ohm's Law, Basic Circuit Components, Kirchhoff's Laws, Types of Sources, Resistive Networks, Series Parallel Circuits, Star Delta and Delta Star Transformation. Principle of AC Voltages, Waveforms and Basic Definitions, Root Mean Square and Average Values of Alternating Currents and Voltage, Form Factor and Peak Factor, Phasor Representation of Alternating Quantities, The J Operator and Phasor Algebra, Analysis of Ac Circuits With Single Basic Network Element, Single Phase Series.

UNIT-II DC Machines

D.C Generators: Principle of Operation of Dc Machines, Types of D.C Generators, E.M.F Equation in D.C Generator, O.C.C. of a D.C. Shunt Generator

D.C Motors:Principle of Operation of Dc Motors, Types of D.C Motors, Torque Equation, Losses and Efficiency Calculation in D.C Motor- Swinburne's Test

UNIT-III AC Machines

Transformers: Principles of Operation, Constructional Details, Losses and Efficiency, Regulation of Transformer, Testing: OC & SC Tests.

Three Phase Induction Motors: Principle of Operation, Slip and Rotor Frequency, Torque (Simple Problems).

Alternators: Principle of Operation-Constructional Details-EMF Equation-Voltage Regulation by Synchronous Impedance Method.

TEXT BOOKS:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
2. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.
3. Electrical and Electronic Technology-By Hughes – Pearson Education.

REFERENCES:

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
3. Fundamentals of Electrical Electronics Engineering by T.Thyagarajan, SCITECH Publications 5th Edition-2007

PART – B

Electronics Engineering

COURSE OBJECTIVES	
The students will be able to	
1	Understand principles and terminology of electronics.
2	familiar with the theory, construction, and operation of electronic devices.
3	Learn about biasing of BJTs and MOSFETs.
4	Design and construct amplifiers

COURSE OUTCOMES	
At the end of this course the student will be able to,	
CO1	Explain the theory, construction, and operation of electronic devices.
CO2	Apply the concept of science and mathematics to explain the working of diodes and its applications, working of transistor and its characteristics.
CO3	Design and analyze small signal amplifier circuits applying the biasing techniques.
CO4	Design simple amplifier circuits. Analyze the small signal equivalent circuits of transistors.
CO5	Correlate the fundamental concepts to various Real life applications of today.

SYLLABUS

UNIT- I

P-N Junction Diode: Diode equation, Energy Band diagram, Volt-Ampere characteristics, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit, Load line analysis, Diffusion and Transition Capacitances.

Rectifiers and Filters: P-N junction as a rectifier – Half Wave Rectifier, Ripple Factor – Full Wave Rectifier, Bridge Rectifier, Harmonic components in Rectifier Circuits, Filters – Inductor Filters, Capacitor Filters, L- section Filters, π- section Filters.

UNIT- II

Bipolar Junction Transistor (BJT): Construction, Principle of Operation, Symbol, Amplifying Action, Common Emitter, Common Base and Common Collector configurations. Transistor Biasing And Stabilization – Operating point, DC and AC load lines, Biasing – Fixed Bias, Emitter Feedback Bias, Collector to Emitter feedback bias, Voltage divider bias, Bias stability, Stabilization against variations in VBE and β, Bias Compensation using Diodes and Transistors.

BJT Amplifiers: Classification of Amplifiers, Analysis of CE, CC, and CB Amplifiers and CE Amplifier with emitter resistance, low frequency response of BJT Amplifiers, effect of coupling and bypass capacitors, Design of single stage RC coupled amplifier.

UNIT- III

Junction Field Effect Transistor: JFET/MOSFET Construction, Principle of Operation, Symbol, Volt-Ampere Characteristic, Comparison of BJT and FET, Small Signal Model, Biasing FET/MOSFET.

Special Purpose Devices: Breakdown Mechanisms in Semi-Conductor Diodes, Zener diode characteristics, Use of Zener diode as simple regulator, Principle of operation and Characteristics of Tunnel Diode (With help of Energy band diagram) and Varactor Diode, Principle of Operation of SCR.

TEXT BOOKS:

1. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
2. Millman's Electronic Devices and Circuits – J.Millman and C.C.Halkias, Satyabratajit, TMH, 2/e, 1998.

REFERENCES:

1. Introduction to Electronic Devices and Circuits-Rober T. Paynter, Pearson Education.
2. Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal – Wiley India Pvt. Ltd. 1/e 2009.
3. Electronic Devices and Circuits – 2nd Edition by Muhammad H.Rashid, Cengage Learning.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A30501	**Object Oriented Programming**	3	-	-	3

COURSE OBJECTIVES	
1	Study the syntax, semantics and features of Java Programming Language
2	Learn Java features to create GUI applications & perform event handling
3	Learn the method of creating Multi-threaded programs and handle exceptions

COURSE OUTCOMES	
CO1	Ability to solve problems using object oriented approach and implement them using Java
CO2	Ability to write Efficient programs with multitasking ability and handle exceptions
CO3	Create user friendly interface

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓

UNIT-1

Thinking Object-Oriented- Why Is OOP Popular, Language and Thought, New Paradigm, Way of Viewing the World, Computation as Simulation.
Abstraction- Layers of Abstraction, Other Forms of Abstraction, Short History of abstraction Mechanisms.

UNIT-II

Object-Oriented Design- Responsibility Implies Non interference, Programming in the Small and in the Large, Why Begin with behaviour, Case Study in RDD, CRC Cards, Components and Behavior, Software Components, Formalize the Interface, Designing the Representation, Implementing Components, Integration of Components, Maintenance and Evolution.
Classes and Methods- Encapsulation, Class Definitions, Methods, Variations on Class themes.

UNIT-III

Messages, Instances, and Initialization- Message-Passing Syntax, Statically and Dynamically Typed Languages, Accessing the Receiver from Within a Method, Object Creation, Pointers and Memory Allocation, Constructors, Destructors and Finalizers, Meta classes in Smalltalk.

Case Study: The Eight Queens Puzzle- The Eight-Queens Puzzle, Using Generators, The Eight-Queens Puzzle in Several Languages.
Inheritance and Substitution- An Intuitive Description of Inheritance, Inheritance in Various Languages, Subclass, Subtype, and Substitution, Overriding and Virtual Methods Interfaces and Abstract Classes, Forms of Inheritance, Variations on Inheritance, The Benefits of Inheritance, The Costs of Inheritance.
UNIT-IV

Subclasses and Subtypes- Substitutability, Subtypes, The Substitutability Paradox, Sub classing for Construction, Dynamically Typed Languages, Pre and Post conditions, Refinement Semantics.
Static and Dynamic Behaviour- Static versus Dynamic Typing, Static and Dynamic Classes, Static versus Dynamic Method Binding.
Implications of Substitution- Memory Layout, Assignment, Copies and Clones, Equality.
UNIT-IV

Multiple Inheritance- Inheritance as Categorization, Problems Arising from Multiple Inheritance, Multiple Inheritance of Interfaces, Inheritance from Common Ancestors, Inner Classes.
Polymorphism and Software Reuse- Polymorphism in Programming Languages, Mechanisms for Software Reuse, Efficiency and Polymorphism, Will Widespread Software Reuse Become Reality.
Overloading- Type Signatures and Scopes, Overloading Based on Scopes, Overloading Based on Type Signatures, Redefinition, Polyadicity, Multi-Methods.
Overriding- Overriding in Smalltalk Class Magnitude, Notating Overriding, Replacement versus Refinement, Deferred Methods, Overriding versus Shadowing, Covariance and Contravariance, Variations on Overriding.

Text books:

1) An Introduction to Object-Oriented Programming (3rd Ed)- Timothy A. Budd, Oregon State University Corvallis, Oregon.

REFENCE BOOKS:

1. "Programming with Java" T.V.Suresh Kumar, B.Eswara Reddy, P.Raghavan Pearson Edition.
2. "Java Fundamentals - A Comprehensive Introduction", Herbert Schildt and Dale Skrien, Special Indian Edition, McGrawHill, 2013.
3. "Java – How to Program", Paul Deitel, Harvey Deitel, PHI.
4. "Core Java", NageswarRao, Wiley Publishers.
5. "Thinking in Java", Bruce Eckel, Pearson Education.
6. "A Programmers Guide to Java SCJP", Third Edition, Mughal, Rasmussen, Pearson.
7. "Head First Java", Kathy Sierra, Bert Bates, O'Reilly "SCJP – Sun Certified Programmer for Java Study guide" – Kathy Sierra, Bert Bates, McGrawHill

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A30502	**Computer Organization**	3	-	-	3

COURSE OBJECTIVES	
1	To learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design
2	To make the students understand the structure and behavior of various functional modules of a computer.
3	To understand the techniques that computers use to communicate with I/O devices
4	To study the concepts of pipelining and the way it can speed up processing.
5	To understand the basic characteristics of multiprocessors

COURSE OUTCOMES	
CO1	Ability to use memory and I/O devices effectively
CO2	Able to explore the hardware requirements for cache memory and virtual memory
CO3	Ability to design algorithms to exploit pipelining and multiprocessors

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓

Unit I:

Basic Structure of Computer:Computer Types, Functional Units, Basic operational Concepts, Bus Structure, Software, Performance, Multiprocessors and Multicomputer.

Machine Instructions and Programs:Numbers, Arithmetic Operations and Programs, Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Stacks and Queues, Subroutines, Additional Instructions.

Unit II:

Arithmetic: Addition and Subtraction of Signed Numbers, Design and Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations.
Basic Processing Unit: Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control, Multiprogrammed Control.

Unit III:
The Memory System: Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage.

Unit IV:
Input/output Organization: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces.

Unit V:
Pipelining: Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction Sets.
Large Computer Systems: Forms of Parallel Processing, Array Processors, The Structure of General-Purpose, Interconnection Networks.

Textbook:
1."Computer Organization", Carl Hamacher, Zvonko Vranesic, Safwat Zaky, McGraw Hill Education, 5th Edition, 2013**.**

Reference Textbooks:

1. Computer System Architecture, M.Morris Mano, Pearson Education, 3rd Edition.
2. Computer Organization and Architecture, Themes and Variations, Alan Clements, CENGAGE Learning.
3. Computer Organization and Architecture, Smruti Ranjan Sarangi, McGraw Hill Education.
4. Computer Architecture and Organization, John P.Hayes, McGraw Hill Education.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A30503	**Discrete Mathematics**	3	-	-	3

COURSE OBJECTIVES	
1	Apply logical reasoning to solve a variety of problems.
2	Understand and apply methods of discrete mathematics such as proofs, counting principles, number theory, logic and set theory to mathematical problems in a creative way.
3	To apply the abstract concepts of graph theory in modelling and solving non-trivial problems in different fields of study

COURSE OUTCOMES	
CO1	Able to apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology.
CO2	Able to apply the concepts in courses like Computer Organization, DBMS, Analysis of Algorithms, Theoretical Computer Science, Cryptography, Artificial Intelligence

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓		✓			✓		✓	
CO2	✓		✓					✓		✓		

Unit - I :
The Language of Logic: Propositions, Logical Equivalences, Quantifiers, Arguments, Proof Methods.
The Language of Sets: The Concepts of a Set, Operations with Sets, Computer Operations with Sets, The Cardinality of a Set, Recursively Defined Sets.
Functions: The concept of Functions, Special Functions, Properties of Functions, The Pigeonhole principle, Composite Functions, Sequences and the Summation Notation.

Unit – II:
Relations: Boolean Matrices, Relations and Digraphs, Computer Representations of Relations, Properties of Relations, Operations on Relations, Transitive Closure, Equivalence Relations, Partial and Total Ordering.
Lattices & Boolean Algebra: Lattices as Partially Ordered Sets, Properties of Lattices, Lattices

as Algebraic Systems, Sub lattices, Direct Product and Homomorphism, Boolean Algebra, Boolean Functions

Unit – III :

Algebraic Structures: Algebraic Systems, Semi groups and Monoids, Groups, Subgroups and Homomorphism's, Normal Subgroups.

Combinatorics: The Fundamental Counting Principles, Permutations, Derangements, Combinations, Permutations and Combinations with Repetitions, The Binomial Theorem, The Generalized Inclusion- Exclusion Principle.

Unit – IV :

Induction and Algorithms: The Division Algorithm, Divisibility Properties, Nondecimal Bases, Mathematical Induction, Algorithm Correctness, The Growth Functions, Complexity of Algorithms.

Recursion: Recursively Defined Functions, Solving Recurrence Relations, Generating Functions, Recursive Algorithms, Correctness of Recursive Algorithms, Complexities of Recursive Algorithms.

Unit – V :

Graphs: Computer Representation of Graphs, Isomorphic Graphs, Paths, Cycles, and Circuits, Eulerian and Hamiltonial Graphs, Planar Graphs, Graph Coloring, Digraphs, Dags, Weighted Digraphs, DFS and BFS Algorithms.

Trees: Trees, Spanning Trees, Minimal Spanning Trees,Kruskal's and Prim's Algorithm, Rooted Trees, Binary Trees, and Binary Search Trees.

Text Books :

1. Discrete Mathematics with Applications, Thomas Koshy, Elsevier Academic Press.
2. Discrete Mathematical Structures with Applications to Computer Science, J.P. Tremblay and R. Manohar, TMH

Reference Books :

1. *Discrete and Combinatorial Mathematics, Fifth Edition, R. P. Grimaldi, B.V. Ramana, Pearson*
2. *Discrete Mathematics Theory and Applications, D.S Malik and M.K. Sen, Cengage Learning*
3. *J .L.Mott, A.Kandel, T.P .Baker, Discrete Mathematics for Computer Scientists and Mathematicians, second edition 1986, Prentice Hall of India*
4. *C.L.Liu, Elements of Discrete Mathematics, Second Edition 1985, McGraw-Hill Book Company. Reprinted 2000*
5. *Discrete Mathematics, Norman L. Biggs, Second Edition, OXFORD Indian Edition.*
6. *K.H.Rosen, Discrete Mathematics and applications, 5^{th} Edition 2003, TataMcGrawHillpublishing Company*
7. Graph Theory with Applications to Engineering & Computer Science: NarsinghDeo, PHI (2004)
8. "Discrete Mathematical Structures" JayantGanguly, Sanguine

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
DEPARTMENT OF CSE
II B.TECH – I SEMESTER (LAB)

Subject Code	Title of the Lab	L	T	P	C
17A32402	Electrical&Electronics Engineering Lab	-	1	3	2

PART- A : ELECTRICAL LAB

Course Objectives: To make the students learn about:

1	Experimental verification of theorems.
2	Learn about Various characteristics and performance analysis of DC machines and Transformers.

Course Outcomes: At the end of the course, students will able to do

CO1	Experimental verification of theorems.
CO2	Experiments and know their characteristics of DC motors, DC Generators and Transformers.

Mapping of Course outcomes with Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	2	2	-	-	1	1	-	1		2
CO2	1	2	2	2	-	1	1	1	-	1	1	2

The course outcomes of each core course are mapped to the program outcomes with a level of emphasis being either strongly correlated (2) and moderately correlated (1).

Practical implementation of active and reactive power measurement techniques

1. Verification of Superposition Theorem.
2. Verification of Thevenin's Theorem.
3. Open Circuit Characteristics of D.C.Shunt Generator.
4. Swinburne's Test on DC Shunt Machine (Predetermination of Efficiency of a Given DC Shunt Machine Working as Motor and Generator).
5. Brake Test on DC Shunt Motor. Determination of Performance Characteristics.
6. OC & SC Tests on Single-Phase Transformer (Predetermination of Efficiency and Regulation at Given Power Factors).

PART B :Electronics Engineering Lab

COURSE OBJECTIVES	
The students will be able to	
1	Understand the characteristics of PN junction diode and zener diode.
2	Understand the characteristics of BJT in CE and CB configurations and FET in CS configuration.
3	Understand the application of diode as rectifier.
4	Learn the fundamental principles of amplifier circuits and need of Bias in Amplifier circuits.

COURSE OUTCOMES	
At the end of this course the student will be able to,	
CO1	Learn and plot the characteristics of electronic devices like PN junction diode, Zener diode and SCR.
CO2	Design and analyze the application of diode as rectifiers.
CO3	Learn and plot the characteristics of BJT & FET in various configurations.
CO4	Measure the h-parameters experimentally.
CO5	Design and construct BJT & FET amplifiers and plot frequency response.

LIST OF EXPERIMENTS:

1. PN Junction diode characteristics A) Forward bias B) Reverse bias.
2. Zener diode characteristics and Zener as voltage Regulator
3. Full Wave Rectifier with & without filter
4. Input & Output characteristics of Transistor in CB / CE configuration.
5. Input and Output characteristics of FET in CS configuration.
6. Measurement of h-parameters of transistor in CB, CE, CC configurations
7. SCR Characteristics.
8. Frequency response of CE amplifier.
9. Frequency response of CS amplifier.

LAB REQUIREMENTS:

Cathode Ray Oscilloscopes (30MHz)
Signal Generator /Function Generators (3 MHz)
Dual Regulated Power Supplies (0 – 30V)
Bread Boards
Electronic Components

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU

****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******

II B.TECH – I SEMESTER

(LAB)

Subject Code	Title of the Lab	L	T	P	C
17A30504	**Object Oriented Programming Lab**	-	1	3	2

COURSE OBJECTIVES	
1	Learn to use object orientation to solve problems and use java language to implement them.
2	To experiment with the syntax and semantics of java language and gain experience with java programming

COURSE OUTCOMES	
CO1	Develop portable programs which work in all environments
CO2	Design & develop web/user interfaces'
CO3	Implement various control statements
CO4	Differentiate overloading and overriding

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓		✓		✓		✓		✓
CO2	✓		✓						✓		✓	
CO3		✓			✓			✓		✓		

CO4		✓		✓		✓		✓		✓		✓

List of Experiments

1) Preparing and practice – Installation of Java software, study of any Integrated development environment, sample programs on operator precedence and associativity, class and package concept, scope concept, control structures, constructors and destructors. Learn to compile, debug and execute java programs.
2) Write Java program(s) on use of inheritance, preventing inheritance using final, abstract classes.
3) Write Java program(s) on dynamic binding, differentiating method overloading and overriding.
4) Write Java program(s) on ways of implementing interface.
5) Write a program for the following
    - Develop an applet that displays a simple message.
    - Develop an applet for waving a Flag using Applets and Threads.
6) Write Java program(s) which uses the exception handling features of the language, creates exceptions and handles them properly, uses the predefined exceptions, and create own exceptions
7) Write java program that inputs 5 numbers, each between 10 and 100 inclusive. As each number is read display it only if it's not a duplicate of any number already read. Display the complete set of unique values input after the user enters each new value.
8) Write Java program(s) on creating multiple threads, assigning priority to threads, synchronizing threads, suspend and resume threads

10) Write a java program to split a given text file into n parts. Name each part as the name of the original file followed by .part<n> where n is the sequence number of the part file.

11) Write a java program to create a super class called Figure that receives the dimensions of two dimensional objects. It also defines a method called area that computes the area of an object. The program derives two subclasses from Figure. The first is Rectangle and second is Triangle. Each of the sub classes override area() so that it returns the area of a rectangle and triangle respectively.

12) Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds

13) Design a simple calculator which performs all arithmetic operations. The interface should look like the calculator application of the operating system. Handle the exceptions if any.

14) Write a java program to handle mouse events

15) Write a java program to handle keyboard events

16) Write a java program that allows conduction of object type examination containing multiple choice questions, and true/false questions. At the end of the examination when the user clicks a button the total marks have to be displayed in the form of the message.

17) Write a java program that creates menu which appears similar to the menu of notepad application of the Microsoft windows or any editor of your choice.
18) Write a java program that creates dialog box which is similar to the save dialog box of the Microsoft windows or any word processor of your choice.
19) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication
20) Write a java program to find and replace pattern in a given file.
21) Use inheritance to create an exception super class called ExceptionA and exception sub classes ExceptionB and ExceptionC, where ExceptionB inherits from ExceptionA and ExceptionC inherits from ExceptionB. Write a java program to demonstrate that the catch block for type ExceptionA catches exception of type ExceptionB and ExceptionC.
22) Write a Java program which opens a connection to standard port on well known server, sends the data using socket and prints the returned data.
23) Write a Java program to create a URLConnection and use it to examine the documents properties and content.
24) Write a Java program which uses TCP/IP and Datagrams to communicate client and server.
25) Create an interface for stack with push and pop operations. Implement the stack in two ways: fixed size stack and Dynamic stack (stack size is increased when stack is full).
26) Create multiple threads to access the contents of a stack. Synchronize thread to prevent simultaneous access to push and pop operations.

References:

1. "Java: How to Program", P.J.Deitel and H.M.Deitel, PHI.
2. "Object Oriented Programming through Java", P.Radha Krishna, Universities Press.
3. "Thinking in Java", Bruce Eckel, Pearson Education
4. "Programming in Java", S.Malhotra and S.Choudhary, Oxford Univ. Press.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A40501	**Operating Systems**	3	-	-	3

COURSE OBJECTIVES	
1	To make the students understand the basic operating system concepts such as processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection.
2	To get acquaintance with the class of abstractions afford by general purpose operating systems that aid the development of user applications.

COURSE OUTCOMES	
CO1	Able to use operating systems effectively.
CO2	Write System and application programs to exploit operating system functionality.
CO3	Add functionality to the exiting operating systems
CO4	Design new operating systems

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

UNIT I

Operating Systems Overview: Operating system functions, Operating system structure, operating systems Operations, protection and security, Computing Environments, Open- Source Operating Systems

System Structures: Operating System Services, User and Operating-System Interface, systems calls, Types of System Calls, system programs, operating system structure, operating system debugging, System Boot.

Processes: Process concept, process Scheduling, Operations on processes, Inter process Communication, Examples of IPC systems.

UNIT II

Threads: overview, Multicore Programming, Multithreading Models, Thread Libraries, Implicit

Threading, Threading Issues.
Process Synchronization: The critical-section problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic problems of synchronization, Monitors, Synchronization examples, Alternative approaches.
CPU Scheduling: Scheduling-Criteria, Scheduling Algorithms, Thread Scheduling, Multiple-Processor Scheduling, Real-Time CPU Scheduling, Algorithm Evaluation.

UNIT III
Memory Management: Swapping, contiguous memory allocation, segmentation, paging, structure of the page table.
Virtual memory: demand paging, page-replacement, Allocation of frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory
Deadlocks: System Model, deadlock characterization, Methods of handling Deadlocks, Deadlock prevention, Detection and Avoidance, Recovery from deadlock.

UNIT IV
Mass-storage structure: Overview of Mass-storage structure, Disk structure, Disk attachment, Disk scheduling, Swap-space management, RAID structure, Stable-storage implementation.
File system Interface: The concept of a file, Access Methods, Directory and Disk structure, File system mounting, File sharing, Protection.
File system Implementation: File-system structure, File-system Implementation, Directory Implementation, Allocation Methods, Free-Space management.

UNIT V
I/O systems: I/O Hardware, Application I/O interface, Kernel I/O subsystem, Transforming I/O requests to Hardware operations.
Protection: Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability-Based systems, Language – Based Protection
Security: The Security problem, Program threats, System and Network threats, Cryptography as a security tool, User authentication, Implementing security defenses, Firewalling to protect systems and networks, Computer–security classifications.

Text Books:
1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Wiley , 9th Edition, 2014.

Reference Books:
1. Operating systems by A K Sharma, Universities Press,
2. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
3. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
4. Operating Systems, A.S.Godbole, Second Edition, TMH.
5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
6. Operating Systems, G.Nutt, N.Chaki and S.Neogy, Third Edition, Pearson Education.
7. Operating Systems, R.Elmasri, A,G.Carrick and D.Levine, Mc Graw Hill.
8. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A40502	**Algorithms**	3	-	-	3

COURSE OBJECTIVES	
1	To know the importance of the complexity of a given algorithm.
2	To study various algorithmic design techniques.
3	To utilize data structures and/or algorithmic design techniques in solving new problems.
4	To know and understand basic computability concepts and the complexity classes P, NP, and NP-Complete.
5	To study some techniques for solving hard problems

COURSE OUTCOMES	
CO1	Analyze the complexity of the algorithms
CO2	Use techniques divide and conquer, greedy, dynamic programming, backtracking, branch and bound to solve the problems.
CO3	Identify and analyze criteria and specifications appropriate to new problems, and choose the appropriate algorithmic design technique for their solution.
CO4	Able to prove that a certain problem is NP-Complete.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

Unit - I :

The Role of Algorithms in Computing, Algorithms, Algorithms as a technology, Getting Started, Insertion sort , Analyzing algorithms, Designing algorithms , Growth of Functions , Asymptotic notation, Standard notations and common functions , Divide-and-Conquer , The maximum-sub-array problem, Strassen's algorithm for matrix multiplication , The substitution method for solving recurrences, The recursion-tree method for solving recurrences , The master method for solving recurrences.

Unit – II:

Heap sort, Heaps, Maintaining the heap property , Building a heap, The heap sort algorithm, Priority queues, Quick sort, Description of quick sort, Performance of quick sort , A randomized version of quick sort , Analysis of quick sort, Sorting in Linear Time, Lower bounds for sorting , Counting sort , Radix sort, Bucket sort.

Unit – III :

Dynamic Programming, Rod cutting, Matrix-chain multiplication, Elements of dynamic programming, Longest common subsequence, Optimal binary search trees, Greedy Algorithms, An activity-selection problem, Elements of the greedy strategy, Huffman codes, Matroids and greedy methods, task-scheduling problem as a matroid,

Unit-IV

Amortized Analysis, Aggregate analysis, The accounting method, The potential method, Dynamic tables, Elementary Graph Algorithms, Representations of graphs, Breadth-first search, Depth-first search, Topological sort, Strongly connected components.

Unit – V :

Backtracking: General method, 8-Queens Problem, Graph Coloring, Knapsack problem.

Minimum Spanning Trees, Growing a minimum spanning tree, The algorithms of Kruskal and Prim, All-Pairs Shortest Paths, Shortest paths and matrix multiplication, The Floyd-Warshall algorithm, Johnson's algorithm for sparse graphs.

NP-Completeness, Polynomial time, Polynomial-time verification, NP-completeness and reducibility, NP-completeness proofs, NP-complete problems.

Text Books :

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, Clofford Stein" Introduction to Algorithms" 3rd Edition, The MIT Press Cambridge, Massachusetts London, England.
2. Ellis Horowitz,Sanguthevar Rajasekaran,Sartaj Sahni "Fundamentals of Computer Algorithms (Second Edition)" Universities Press.

References :

1. "Fundamentals of Computer Algorithms", Ellis Horowitz, S. Satraj Sahani and Rajasekhran, 2nd edition, 2012, University Press.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A40503	**Data Base Management Systems**	3	-	-	3

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

COURSE OUTCOMES	
CO1	Demonstrate the basic elements of a relational database management system,
CO2	Ability to identify the data models for relevant problems.
CO3	Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data.
CO4	Apply normalization for the development of application software.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

UNIT-I

Introduction-Database System Applications, Purpose of Database Systems, View of Data - Data Abstraction, Instances and Schemas, Data Models, Database Languages - DDL, DML, Database Architecture, Database Users and Administrators, History of Data base Systems.

Introduction to Data base design , ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises. Relational Model: Introduction to the Relational Model - Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views Destroying/ altering Tables and Views.

UNIT-II

Relational Algebra and Calculus: Relational Algebra - Selection and Projection, Set operations, Renaming, Joins, Division, Examples of Algebra Queries, Relational calculus - Tuple relational Calculus - Domain relational calculus - Expressive Power of Algebra and calculus.

Form of Basic SQL Query - Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set - Comparison Operators, Aggregate Operators, NULL values - Comparison using Null values - Logical connectives - AND, OR and NOT - Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT-III

Introduction to Schema Refinement - Problems Caused by redundancy, Decompositions - Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms - FIRST, SECOND, THIRD Normal forms - BCNF - Properties of Decompositions - Loss less join Decomposition, Dependency preserving Decomposition, Schema Refinement in Data base Design - Multi valued Dependencies - FOURTH Normal Form, Join Dependencies, FIFTH Normal form, Inclusion Dependencies.

UNIT-IV

Transaction Management - Transaction Concept - Transaction State - Implementation of Atomicity and Durability - Concurrent - Executions - Serializability - Recoverability - Implementation of Isolation - Testing for serializability.

Concurrency Control - Lock - Based Protocols - Timestamp Based Protocols - Validation - Based Protocols - Multiple Granularity.

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

UNIT-V

Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing - Clustered Indexes, Primary and Secondary Indexes, Index data Structures - Hash Based Indexing, Tree based Indexing, Comparison of File Organizations.

Tree Structured Indexing: Intuitions for tree indexes, Indexed Sequential Access Methods(ISAM) B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.

Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing, Extendible vs. Linear Hashing.

TEXT BOOKS:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, McGrawHill Education, 3rd Edition, 2003.
2. Data base System Concepts, A.Silberschatz, H.F. Korth, S.Sudarshan, McGraw Hill, VI edition, 2006.

REFERENCES:

1. Database Systems, 6th edition, Ramez Elmasri, Shamkat B. Navathe, Pearson Education, 2013.
2. Database Systems Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.
3. Introduction to Database Systems, C.J. Date, Pearson Education.
4. Database Management Systems, G.K. Gupta, McGrawHill Education.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A40504	**Theory of Computation**	3	-	-	3

COURSE OBJECTIVES	
1	Understand formal definitions of machine models.
2	Classify machines by their power to recognize languages.
3	Understanding of formal grammars, analysis
4	Understanding of hierarchical organization of problems depending on their complexity
5	Understanding of the logical limits to computational capacity
6	Understanding of undecidable problems

COURSE OUTCOMES	
CO1	Construct finite state diagrams while solving problems of computer science
CO2	Find solutions to the problems using Turing machines
CO3	Design of new grammar and language

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓	✓	
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4	✓		✓		✓		✓		✓	✓		

Unit - I :
Preliminaries: Sets, Relations and functions, Methods of proof, Graphs, Languages: Basic Concepts.
Grammars: Definitions and classifications of grammar, Ambiguity, Simplification of CFGs, Normal forms.

Unit – II:
Finite State Automata: DFSA, NFSA, Regular Expressions
Finite State Automata: Characterization, Properties and decidability: FSA Regular Grammars, Pumping lemma for regular sets, Closure Properties, Decidability theorems.

Finite State Automata with Output and Minimization: Myhill-Nerode theorem, Finite Automata with output.
Variants of Finite Automata: Two way finite automata, Multi head Finite Automata.

Unit – III :
Pushdown Automata: The Pushdown Automation, Equivalence between acceptance by empty store and acceptance by Final State, Equivalence of CFG and PDA.
CFG-Properties and Parsing: Pumping Lemma for CFL, Closure Properties for CFL, Decidability results for CFL, Sub families of CFL.

Unit – IV :
Turing Machines: Turing Machine as a acceptor, Turing Machine as a computing device, Techniques for Turing Machine Construction.
Variations of Turing Machine: Generalized Versions, Restricted Turing Machines, Turing Machines as Enumerated, Equivalence between Turing Machines and Type Zero Languages, Linear Bounded Automata.

Unit – V :
Universal Turing Machine and Decidability: Encoding and Enumeration of Turing Machines, Recursive and Recursively Enumerable Sets, Universal Turing Machines, Problems, Instances and Languages, Rice's Theorem, Reduction of Problems to show undecidability, Post's correspondence problem, Computable functions.
Time and Space Complexity: The RAM model, Time and Tape Complexity of Turing Machines.
New Models of Computations: DNA Computing, Membrane Computing

Text Books :

1. "Introduction to Formal Languages, Automata Theory and Computation", Kamala Krithivasan, Rama R, PEARSON.

1. "Introduction to Automata Theory, Languages, and Computation", Third Edition, John E.Hopcroft, Rajeev Motwani, Jeffery D. Ullman, PEARSON.
2. "Introduction To Languages And The Theory of Computation", John C Martin, The McGraw-Hill Companies, Third Edition. (TATA McGRAW HILL)
3. "Introduction to Automata Theory, Formal Languages and Computation", Shyamalendu kandar, PEARSON.
4. "Theory of Computation", Vivek Kulkarni, OXFORD.
5. "Theory of computer Science Automata, Languages and Computation", K.L.P. Mishra, N. Chandrasekaran, PHI, Third Edition.

6. “Formal Languages and Automata Theory”, C.K. Nagpal, OXFORD.
7. “Fundamentals of the Theory of Computation, Principles and Practice”, Raymond Greenlaw, H. James Hoover, MK(MORGAN KAUFMANN)

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
B.Tech. II – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A40505	Linux Programming	3	-	-	3

COURSE OBJECTIVES	
1	To study the commands according to user requirements.
2	To utilize Shell scripts to perform the given task.
3	To enable writing own programs in UNIX.
4	To know AWK programs

COURSE OUTCOMES	
CO1	Develop text data processing applications using Unix commands and filters.
CO2	Design and develop text based user interface components
CO3	Understand user management, network management and backup utilities
CO4	Use the system calls for file management

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓					✓		✓			✓	✓
CO2		✓		✓								✓
CO3			✓		✓		✓		✓	✓		
CO4		✓		✓							✓	
CO5	✓		✓			✓			✓			✓

SYLLABUS

Unit I

Introduction: Operating System, History of UNIX, Overview and Features of Unix System, Structure of Unix System, Unix Environment. **Unix File System**: Introduction of Files, Organization of File Systems, Accessing File Systems, Structure of File Systems. **Unix Commands**: Basic Commands, Advanced Unix Commands: File Access Permissions, Pipe Operator, cut, paste, wc, sort, head, tail, diff, cmp, uniq, comm, time, Conversions between DOS and Unix, man.

Unit II

File management and Compression Techniques: Managing and Compressing Files, Computer Devices, Disk related Commands, Compression and Uncompressing Files, Important Unix System Files, Shell Variables, Export of Local and Global Shell Variables. **Manipulating Processes and Signals**: Process Basics, Processes States and Transitions, Zombie Process, Context switching, Threads, ps-status of Process.

Unit III

System calls: Introduction, File-related System calls (open, create, read, write, lseek, close, mknod, link and unlink, access, and chown, chmod), Directory Handling System calls (mkdir, rmdir, chdir, opendir, readdir, telldir, closedir). Porcess related System calls (exec, fork, wait,exit).
Editors in Unix: introduction, Stream editor, Emacs Editor.

Unit IV

AWK Script: AWK Command, print, printf, Displaying Content of Specified Patterns, Comparison Operators, Compound Expressions, Arithmetic Operators, Begin and end Sections, User-defined Variables, if else Statement, Built-in Variables, Changing Input Filed Separator, Functions, Loops, Getting Input from User, Search and Substitute Functins, Copying results into Another file. **Bourne Shell**: Introduction, beginning Bourne Shell Scripting, Writing Shell Scripts, Command Line Parameters, read, for Loop, While Loop, if Statement, Bourne Shell Commands.

Unit V

Interprocess Communications: Interprocess Communication, Synchronization, Filters.
Unix System Administration and Networking: Unix Booting Procedure, Mounting Unix File System, Unmounting Unix File System, Managing User Accounts, Networking Tools, mail Command, Distributed File System, Firewalls, Backup and Restore.

Text Books:

1. "UNIX and SHELL Programming", B.M. HARWANI, OXFORD UNIVERSITY PRESS.

References:

1. "UNIX and Linux System Administration Handbook", Evi Nemeth, Garth Snyder, Trent R. Hein and Ben Whaley, PHI
2. "Essential Linux Administration: A Comprehensive Guide for Beginners", Chuck Easttom, Cengage Learning
3. "The Linux Programming Interface: A Linux and UNIX System Programming

Handbook", Michael Kerrisk, No Starch Press

4. "A Practical Guide to Linux Commands, Editors, and Shell Programming", 3rd Edition, Mark G. Sobell, PHI
5. "UNIX Network Programming", W. Richard Stevens, PHI
6. "Unix: *The Ultimate Guide",* Sumitabha Das, Tat Mcgraw-Hill Edition, Indian reprint 2012

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – IISEMESTER(R17)
HUMAN VALUES AND PROFESSIONAL ETHICS(Audit course)

(w.e.f academic year 2017-18)

Subject Code	Title of the Subject	L	T	P	C
17A45101	HUMAN VALUES AND PROFESSIONAL ETHICS	2		0	0

COURSE OBJECTIVES	
1	To bring awareness among engineering graduates on ethics, human values & obligations.
2	To understand the ethical theories and their application to work ethics.
3	To understand the risk and safety measurements to be taken in various engineering areas.
4	To know various codes of ethics used by professional bodies & to learn about professional responsibility as an engineer.
5	To identify the global issues & measures to control adversity.

COURSE OUTCOMES	
CO1	Develop awareness on ethics, human values & obligations related to Self, Family, Society and State.
CO2	Become morally and socially responsible.
CO3	As a social experimentalist they can ensure less hazards & can find out engineering solutions from the ethical platform.
CO4	Students Can know how to ensure safety by minimizing risk through detailed analysis & can plan to get Intellectual property Rights(IPR).
CO5	Can identify various global issues, moral & social responsibilities.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

HUMAN VALUES AND PROFESSIONAL ETHICS(Audit course)

SYLLABUS

Unit I: HUMAN VALUES

Morals, Values and Ethics-Integrity-Work Ethic-Service learning – Civic Virtue – Respect for others – Living Peacefully – Caring – Sharing – Honesty - Courage- Co-operation& Commitment – Empathy – Self Confidence Character – Spirituality- Obligations to Self, Family, Society and the State.

Unit II: ENGINEERING ETHICS

Senses of 'Engineering Ethics- Variety of Moral Issues – Types of Inquiry – Moral dilemmas – Moral Autonomy –Kohlberg's Theory- Gilligan's Theory- Consensus and Controversy – Models of Professional Roles- Theories about Right Action- Self interest - Customs and Religion –Uses of Ethical Theories.

Unit III: ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering As Social Experimentation – Framing the Problem – Determining the Facts – Codes of Ethics – Clarifying Concepts – Application Issues – Common Ground - General Principles – Utilitarian Thinking -Respect for Human beings.

UNIT IV: ENGINEERS RESPONSIBILITY FOR SAFETY AND RISK

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk- Safety and the Engineer- Designing for the Safety- Intellectual Property rights (IPR).

UINIT V: GLOBAL ISSUES

Globalization – Cross Culture Issues- Environmental Ethics – Computer Ethics – Computers as The Instrument of Unethical Behavior – Computers as the Object of Unethical Acts – Autonomous Computers- Computer Codes of Ethics – Weapons Development - Ethics and Research- Moral & Social Responsibility- Code of Conduct.

Text Books:

1. "Engineering Ethics includes Human Values" by M.Govindarajan, S.Natarajan and V.S.Senthil Kumar-PHI Learning Pvt. Ltd-2009,Rs.129.

References:

1. "Human Values & Ethics", SK Chakraborty & D.Chakraborty, Himalaya Publishing House, Mumbai,2014,Rs.398.

2. "2006Human Values & Professional Ethics ", B.S.Raghava and Jayashree Suresh, S.Chand &co., New Delhi, 2012.Rs.175
3. "Human Values & Ethics in the Workplace", Glenn Martin, GP Martin Publishing, Australia, 2007.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A40506	**Algorithms Lab**	3	-	-	3

COURSE OBJECTIVES	
1	To know the importance of the complexity of a given algorithm.
2	To study various algorithmic design techniques.
3	To utilize data structures and/or algorithmic design techniques in solving new problems.
4	To know and understand basic computability concepts and the complexity classes P, NP, and NP-Complete.
5	To study some techniques for solving hard problems

COURSE OUTCOMES	
CO1	Analyze the complexity of the algorithms
CO2	Use techniques divide and conquer, greedy, dynamic programming, backtracking, branch and bound to solve the problems.
CO3	Identify and analyze criteria and specifications appropriate to new problems, and choose the appropriate algorithmic design technique for their solution.
CO4	Able to prove that a certain problem is NP-Complete.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

Note: You may develop programs using java or C++

1. Write a program that implements Prim's algorithm to generate minimum cost spanning tree.
2. Write a program that implements Kruskal's algorithm to generate minimum cost spanning tree.
3. Write a program to implement Huffman's algorithm for text compression.
4. Write a program to implement Dijkstra's algorithm for Single source shortest path problem.
5. Write a program to implement Floyd's algorithm for the All pairs shortest path problem.
6. Write a program to implement greedy algorithm for job sequencing with deadlines.
7. Write programs for the implementation of bfs and dfs for a given graph.
8. Write a program to find Minimum Cost Binary Search Tree.
9. Write a program to implement Dynamic Programming algorithm for 0/1 Knapsack problem.
10. Write a program to implement the Backtracking algorithm for the sum of subsets problem.
11. Write programs to implement backtracking algorithms for
    a) N-queens problem
    b) The Hamiltaonian cycles problem
    c) The m-colourings graph problem

TEXT BOOKS

1. Data structures and Algorithms in java,3rd edition,A.Drozdek,Cengage Learning.
2. Data structures with Java,J.R.Hubbard,2nd edition,Schaum's Outlines,TMH.
3. Data structures and algorithms in Java, 2nd Edition, R.Lafore, Pearson Education.
4. Data Structures using Java, D.S.Malik and P.S. Nair, Cengage Learning.
5. Data structures, Algorithms and Applications in java, 2nd Edition, S.Sahani, Universities Press.
6. Data structures, Algorithms and Applications in C++, 2nd Edition, S.Sahani, Universities Press.
7. Data structures and Algorithm Analysis in C++,2nd Edition,M.A.Weiss,Pearson education.
8. Design and Analysis of Algorithms, P.H.Dave and H.B.Dave, Pearson education.
9. Data structures and java collections frame work,W.J.Collins,Mc Graw Hill.
10. A Practical guide to Data structures and Algorithms using Java,Goldman&Goldman, Chapman and Hall/CRC,Taylor and Francis Group.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – II SEMESTER
(LAB)

Subject Code	Title of the Lab	L	T	P	C
17A40507	**Database management systems Lab**	-	1	3	2

COURSE OBJECTIVES	
1	To create a database and query it using SQL, design forms and generate reports.
2	Understand the significance of integrity constraints, referential integrity constraints, triggers, assertions.

COURSE OUTCOMES	
CO1	Design databases
CO2	Retrieve information from data bases
CO3	Use procedures to program the data access and manipulation
CO4	Create user interfaces and generate reports

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

List of Experiments:

1. Practice session: Students should be allowed to choose appropriate DBMS software, install it, configure it and start working on it. Create sample tables, execute some queries, use SQLPLUS features, use PL/SQL features like cursors on sample database. Students should be permitted to practice appropriate User interface creation tool and Report generation tool.

2. A college consists of number of employees working in different departments. In this context, create two tables**employee** and **department**. Employee consists of columns empno, empname, basic, hra, da, deductions, gross, net, date-of-birth. The calculation of hra,da are as per the rules of the college. Initially only empno, empname, basic have valid values. Other values are to be computed and updated later. Department contains deptno, deptname, and description columns. Deptno is the primary key in department table and referential integrity constraint exists between employee and department tables. Perform the following operations on the the database:

- Create tables department and employee with required constraints.
- Initially only the few columns (essential) are to be added. Add the remaining columns separately by using appropriate SQL command
- Basic column should not be null
- Add constraint that basic should not be less than 5000.
- Calculate hra,da,gross and net by using PL/SQL program.
- Whenever salary is updated and its value becomes less than 5000 a trigger has to be raised preventing the operation.
- The assertions are: hra should not be less than 10% of basic and da should not be less than 50% of basic.
- The percentage of hra and da are to be stored separately.
- When the da becomes more than 100%, a message has to be generated and with user permission da has to be merged with basic.
- Empno should be unique and has to be generated automatically.
- If the employee is going to retire in a particular month, automatically a message has to be generated.
- The default value for date-of-birth is 1 jan, 1970.
- When the employees called daily-wagers are to be added the constraint that salary should be greater than or equal to 5000 should be dropped.
- Display the information of the employees and departments with description of the fields.
- Display the average salary of all the departments.
- Display the average salary department wise.
- Display the maximum salary of each department and also all departments put together.
- Commit the changes whenever required and rollback if necessary.
- Use substitution variables to insert values repeatedly.
- Assume some of the employees have given wrong information about date-of-birth. Update the corresponding tables to change the value.
- Find the employees whose salary is between 5000 and 10000 but not exactly 7500.
- Find the employees whose name contains ‘en’.
- Try to delete a particular deptno. What happens if there are employees in it and if there are no employees.
- Create alias for columns and use them in queries.
- List the employees according to ascending order of salary.
- List the employees according to ascending order of salary in each department.
- Use ‘&&’ wherever necessary

- Amount 6000 has to be deducted as CM relief fund in a particular month which has to be accepted as input from the user. Whenever the salary becomes negative it has to be maintained as 1000 and the deduction amount for those employees is reduced appropriately.
- The retirement age is 60 years. Display the retirement day of all the employees.
- If salary of all the employees is increased by 10% every year, what is the salary of all the employees at retirement time.
- Find the employees who are born in leap year.
- Find the employees who are born on feb 29.
- Find the departments where the salary of atleast one employee is more than 20000.
- Find the departments where the salary of all the employees is less than 20000.
- On first January of every year a bonus of 10% has to be given to all the employees. The amount has to be deducted equally in the next 5 months. Write procedures for it.
- As a designer identify the views that may have to be supported and create views.
- As a designer identify the PL/SQL procedures necessary and create them using cursors.

Use appropriate Visual programming tools like oracle forms and reports, visual basic etc to create user interface screens and generate reports.

Note: As a designer identify other operations that may be required and add to the above list. The above operations are not in order. Order them appropriately. Use SQL or PL/SQL depending on the requirement.

3. Students may be divided into batches and the following experiments may be given to them to better understand the DBMS concepts. Students should gather the required information, draw ER diagrams, map them to tables, normalize, create tables, triggers, procedures, execute queries, create user interfaces, and generate reports.

    - Student information system
    - APSRTC reservation system
    - Hostel management
    - Library management
    - Indian Railways reservation
    - Super market management
    - Postal system
    - Banking system
    - Courier system

- Publishing house system

References:

1. “Oracle Database 11g PL/SQL Programming”, M.Mc Laughlin,TMH.
2. “Learning Oracle SQL and PL/SQL”, Rajeeb C. Chatterjee, PHI.
3. “Introduction to SQL”, Rick F.Vander Lans, Pearson education.
4. “Oracle PL/SQL”, B.Rosenzweig and E.Silvestrova, Pearson education.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
II B.TECH – II SEMESTER
(LAB)

Subject Code	Title of the Lab	L	T	P	C
17A40508	**Operating systems Lab**	-	1	3	2

COURSE OBJECTIVES	
1	To understand the design aspects of operating system
2	To solve various synchronization problems

COURSE OUTCOMES	
CO1	Ensure the development of applied skills in operating systems related areas.
CO2	Able to write software routines modules or implementing various concepts of operating system.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	

1. Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
a) FIFO b) LRU c) LFU Etc. …
8. Simulate Paging Technique of memory management
9. Control the number of ports opened by the operating system with
   a) Semaphore b) monitors
10. Simulate how parent and child processes use shared memory and address space
11. Simulate sleeping barber problem
12. Simulate dining philosopher's problem
13. Simulate producer and consumer problem using threads (use java)
14. Simulate little's formula to predict next burst time of a process for SJF scheduling algorithm.
15. Develop a code to detect a cycle in wait-for graph
16. Develop a code to convert virtual address to physical address
17. Simulate how operating system allocates frame to process

18. Simulate the prediction of deadlock in operating system when all the processes announce their resource requirement in advance.

Reference Books :

1. “Operating System Concepts”, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. “Operating Systems: Internals and Design Principles”, Stallings, Sixth Edition–2009, PearsonEducation
3. “Modern Operating Systems”, Andrew S Tanenbaum, Second Edition, PHI.
4. “Operating Systems”, S.Haldar, A.A.Aravind, Pearson Education.
5. “Principles of Operating Systems”, B.L.Stuart, Cengage learning, India Edition.
2013-2014
6. “Operating Systems”, A.S.Godbole, Second Edition, TMH.
7. “An Introduction to Operating Systems”, P.C.P. Bhatt, PHI.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER(R17)

Subject Code	Title of the Subject	L	T	P	C
17A55401	**MANAGEMENT SCIENCE**	3	-	-	3

COURSE OBJECTIVES	
1	To provide fundamental knowledge on Management, Administration, Organization & its concepts.
2	To understand the role of management in Production
3	To study Materials/Purchases/Stores/Inventory/Marketing Management and Quality control
4	To study HRM in order to have an idea on Recruitment, Selection, Training &Development, job evaluation and Merit rating concepts.
5	To identify Strategic Management areas & to Study the PERT/CPM for better Project Management.

COURSE OUTCOMES	
CO1	1. To apply the concepts & principles of management & designs of organization in a practical world.
CO2	To design good plant layout and apply Work-study principles, Quality Control techniques, in real life industry & To maintain & control the Inventory & students can able to identify the importance of marketing in emerging world.
CO3	To apply the concepts of HRM in Recruitment, Selection, Training & Development.
CO4	To develop PERT/CPM Charts for projects of an enterprise and estimate time & cost of project & to analyse the business through SWOT .
CO5	They can aware of the latest and contemporary issues of management science.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

MANAGEMENT SCIENCE

SYLLABUS

UNIT I:INTRODUCTION TO MANAGEMENT:
Management-Concept and meaning-Nature-Functions-Management as a Science and Art and both. Schools of Management Thought-Taylor's Scientific Theory-Henry Fayol's principles-Eltan Mayo's Human relations-Systems Theory- **Organizational Structure and Design**: Features of Organizational

Structure-Work Specialization-Departmentation-Span of Control-Centralization and Decentralization. **Organisational Designs**-Line organization-Line & Staff Organization-Functional Organization-Matrix Organization-Project Organization-Committee form of Organization-Social responsibilities of Management.

UNIT II:OPERATIONS MANAGEMENT:

Principles and Types of Plant Layout-Methods of Production (Job, batch and Mass Production), Work Study- Statistical Quality Control**:***C*chart, *P* chart, (simple Problems) Deming's contribution to Quality. **Material Management:** Objectives-Inventory-Functions, Types, Inventory Techniques-EOQ-ABC Analysis-Purchase Procedure and Stores Management-Just-In-Time (JIT). **Marketing Management:** Concept- Meaning - Nature-Functions of Marketing- Marketing Mix- Channels of Distribution - Advertisement and Sales Promotion- Marketing Strategies based on Product Life Cycle.

UNIT III:HUMAN RESOURCES MANAGEMENT (HRM):

HRM- Definition and Meaning – Nature-Managerial and Operative functions-Evolution of HRM-Job Analysis -Human Resource Planning(HRP)-Employee Recruitment-Sources of Recruitment-Employee Selection- Process and Tests in Employee Selection- Employee Training and Development-On- the- job & Off- the- job training methods-Performance Appraisal Concept-Methods of Performance Appraisal-Placement-Employee Induction-Wage and Salary Administration-Objectives-Essentials of Wage and Salary Administration-Job Evaluation-Employee Grievances-Techniques of handling Grievances.

UNIT IV:STRATEGIC& PROJECT MANAGEMENT:

Definition& Meaning-Setting of Vision- Mission- Goals- Corporate Planning Process- Environmental Scanning-Steps in Strategy Formulation and Implementation-SWOT Analysis. **Project Management:**Network Analysis- Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying Critical Path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (Simple problems).

UNIT V:CONTEMPORARY ISSUES IN MANAGEMENT:

The concept of Management Information System(MIS)- Materials Requirement Planning (MRP)-Customer Relations Management(CRM)- Total Quality Management (TQM)- Six Sigma Concept-Supply Chain Management(SCM)- Enterprise Resource Planning (ERP)- Performance Management-Business Process Outsourcing (BPO), Business Process Re-engineering and Bench Marking -Balanced Score Card-Knowledge Management.

Text Books:

1. A.R Aryasri: Management Science, TMH, 2013
2. Stoner, Freeman, Gilbert, Management, Pearson Education,New Delhi, 2012.

References:

1. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2005.
2. Thomas N.Duening & John M.Ivancevich ManagementPrinciples and Guidelines,Biztantra.
3. Kanishka Bedi, Production and Operations Management, Oxford University Press, 2004.
4. Memoria & S.V.Gauker, Personnel Management, Himalaya, 25/e, 2005

5. Samuel C.Certo: Modern Management, 9/e, PHI, 2005
6. Schermerhorn, Capling, Poole & Wiesner: Management, Wiley, 2002.
7. Parnell: Strategic Management, Biztantra, 2003.
8. Lawrence R Jauch, R.Gupta &William F.Glueck: Business Policy and Strategic Management, Frank Bros., 2005.

Method of Evaluation:

The distribution shall be 40 marks for Internal Evaluation and 60 marks for the External Evaluation. Each Internal examination shall consist of an objective test for 10 marks and a subjective test for 20 marks with duration of 20 and 90 minutes respectively. In addition to that 10 marks will be awarded for assignment.

Data Books Required: No.

Signature

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – ISEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A50501	**Web technologies**	3	-	-	3

COURSE OBJECTIVES	
1	Learn to build and access databases using java.
2	Learn to communicate over a network using java.
3	Learn to design server side programs and access them from client side.

COURSE OUTCOMES	
CO1	Upon completion of this course, students will receive: **Familiarity with WWW technical concepts:** IP addressing, routing, client-server interaction, andbasic HTTP server functionality.
CO2	**Exposure to basic web programming:** including Htmlprogramming (manual and tool assisted), JavaScript programming of reactive web pages elements.
CO3	**Exposure to** database programming using java
CO4	The necessary skills to write server side programs A solid foundation for further exploration of more advanced web programming technologies.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

UNIT I
Fundamentals: Introduction to the web, Web servers and clients, Resources, URL and its anatomy, message format, persistent and non persistent connections, Web caching, proxy, java and the net, java network classes and interfaces, looking up internet address, client/server programs, socket programming, e-mail client, POP3 programs, remote method invocation, example
Selectors

UNIT II
HTML: HTML and its flavors, HTML basics, Elements, Attributes and tags, Basic tags, Advanced Tags, Frames, Images, Meta tag, Planning of webpage, Model and structure for a website, designing web pages, Multimedia content.
Cascading Style Sheets: Advantages, Adding CSS, Browser, compatibility, CSS and Page

layout, Selectors

UNIT III

Java Script: Introduction, Variables, Literals, Operators, Control structure, Conditional statements, Arrays,Functions, Objects, Predefined objects, Object hierarchy, Accessing objects, Events, Event handlers, Multiple windows and Frames, Form object and Element, Advanced JavaScript and HTML, Data entry and Validation, Tables and Forms, DHTML with JavaScript

UNIT IV

Server side programming: Internet programming paradigm, Server-side programming, Languages for CGI,Applications, Server environment, Environment variables, CGI building blocks, CGI scripting using C, Shell script, Writing CGI program, CGI security, Alternatives and Enhancement to CGI, Server-side Java, Advantages over applets, Servlet alternatives, Servlet strengths, Servlet Architecture, Servlet Life cycle, Generic and HTTP Servlet, First servlet, passing parameters to servlets, retrieving parameters, Server-side include, cookies, filters, Problems with servlet, Security issues, JSP and HTTP, JSP Engines, How JSP works, JSP and Servlet, Anatomy of a JSP Page, JSP syntax, JSP components.

UNIT V

Sever side programming continued: Beans, Session tracking, Users passing control and data betweenpages, Sharing session and Application data, Database connectivity, JDBC drivers, Basic steps, Loading a driver, Making a connection, Execute and SQL statement, SQL statements, Retrieving the result, Getting database information, Scrollable and updatable result set, Result set metadata, Introduction to JavaBeans, Bean builder, Advantages of Java Beans, BDK introspection, Properties, Bean Info interface, Persistence, Customizer, JavaBeans API, EJB, Introduction to Struts Framework.

Text Books:

1. Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, And AJAX, Black Book, KOGENT LEARNING SOLUTIONS INC.
2. Web Technologies, Uttam K. Roy, 1st edition 7th impression, 2012, Oxford Higher Education

Reference Books:

1. Java How to program, Paul deitel, Harvey deital, PHI
   Introduction to Java Programming, Y.Daniel Liang, 6th Edition, Pearson Education,
2. 2007
3. The J2EE Tutorial, Stephanie Bodoff et al, 2nd Edition, Pearson Education, 2004.
4. Web Technologies, Roy, Oxford University Press
5. Web Technologies, Srinivasan, Pearson Education, 2012

Java EE 5 for Beginners, Ivan Bayross, Sharanam Shah, Cynthia Bayrossand Vaishali Shai, SPD. Programming the Worldwide Web, Robert W.Sebesta, 7th edition, 2009, Pearson Education example

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER

(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A50502	**Compiler Design**	2	2	-	3

COURSE OBJECTIVES	
1	This course is a *de facto* capstone course in Computer Science, as it combines skills in software design, programming, data structures and algorithms, theory of computing, documentation, and machine architecture to produce a functional compiler.
2	Realize that computing science theory can be used as the basis for real applications
3	Introduce the major concept areas of language translation and compiler design. Learn how a compiler works
4	Know about the powerful compiler generation tools and techniques, which are useful to the other non-compiler applications
5	Know the importance of optimization and learn how to write programs that execute faster

COURSE OUTCOMES	
CO1	Able to design a compiler for a simple programming language
CO2	Able to use the tools related to compiler design effectively and efficiently
CO3	Able to write an optimized code

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO1 2
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3					✓		✓					

UNIT-I

Introduction: Language processors, Phases of a compiler, Pass and phase, Bootstrapping, Compiler construction tools, Applications of compiler technology.

Lexical Analysis: Role and Responsibility, Input buffering, Specification of tokens, Recognition of tokens, LEX tool, Design of a Lexical Analyzer generator

UNIT-II

Syntax Analysis: Role of the parser, Context Free Grammars : Definition, Derivations, Parse trees, Ambiguity, Eliminating ambiguity, Left recursion, Left factoring.

TOP Down Parsing: Recursive descent parsing, Non-recursive predictive parsing, LL(1) grammars, Error recovery in predictive parsing.

Bottom Up Parsing: Handle pruning, Shift-Reduce parsing, Conflicts during shifts- reduce parsing, SLR Parsing, Canonical LR(1) parsers, LALR parsers, Using ambiguous grammars, YACC tool.

UNIT-III

Syntax Directed Translation: Syntax Directed Definitions, Evaluation orders for SDD's, Application of SDT, SDT schemes.

Intermediate Code Generation: Need for intermediate code, Types of intermediate code, Three address code, Quadruples, Triples, Type expressions, Type equivalence, Type checking, Translation of expressions, control flow statements, switch statement, procedures, back patching.

UNIT-IV

Run Time Storage Organization: Storage Organization, Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management.

Code Generation : Issues in the Design of a Code Generator, The Target Language, Addresses in the Target Code, A Simple Code Generator.

UNIT-V

Code Optimization: Principle source of Optimization, Basic Blocks and Flow Graphs, Optimization of Basic Blocks, Introduction to Data-Flow Analysis, Constant Propagation, Partial-Redundancy Elimination, Loops in Flow Graphs.

Region- Based Analysis: Regions, Region Hierarchies for Reducible Flow Graphs, Overview of a Region -Based Analysis.

Text Books:

1. "Compilers Principles, Techniques and Tools", Second Edition, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman., Pearson.

Reference Books :

1."Compiler Construction", K.V.N Sunitha, Pearson, 2013

2."Engineering A Compiler", Second Edition, Keith D. Cooper & Linda Torczon., MK(Morgan Kaufmann) (ELSEVIER)

3."Compilers Principles and Practice", Parag H. Dave, Himanshu B. Dave.,PEARSON

4."Compiler Design", SandeepSaxena, Rajkumar Singh Rathore., S.Chand publications

5."Compiler Design", SantanuChattopadhyay., PHI

6."Principals of Compiler Design", Nadhni Prasad, Elsevier

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A50503	**Software Engineering**	2	2	-	3

COURSE OBJECTIVES	
1	To understand the software life cycle models.
2	To understand the software requirements and SRS document.
3	To understand the importance of modeling and modeling languages.
4	To design and develop correct and robust software products.
5	To understand the quality control and how to ensure good quality software.
6	To understand the planning and estimation of software projects.
7	To understand the implementation issues, validation and verification procedures.
8	To understand the maintenance of software

COURSE OUTCOMES	
CO1	Define and develop a software project from requirement gathering to implementation.
CO2	Obtain knowledge about principles and practices of software engineering.
CO3	Focus on the fundamentals of modeling a software project.
CO4	Obtain knowledge about estimation and maintenance of software systems

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

Unit - I :

Software and Software Engineering: The Nature of Software, The Unique Nature of WebApps, Software Engineering, Software Process, Software Engineering Practice, Software Myths.

Process Models: A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Terminology, Product and Process.

Agile Development: Agility, Agility and the Cost of Change, Agile Process, Extreme

Programming, Other Agile Process Models

Unit – II:

Requirements Analysis And Specification: Requirements Gathering and Analysis, Software Requirement Specification (SRS), Formal System Specification.

Software Design: Overview of the Design Process, How to Characterise of a Design?, Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design.

Unit – III :

Function-Oriented Software Design: Overview of SA/SD Methodology, Structured Analysis, Developing the DFD Model of a System, Structured Design, Detailed Design, Design Review, Over view of Object Oriented design.

User Interface Design: Characteristics of Good User Interface, Basic Concepts, Types of User Interfaces, Fundamentals of Component-based GUI Development, A User Interface Design Methodology.

Unit – IV :

Coding And Testing: Coding, Code Review, Software Documentation, Testing, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tool, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing.

Unit – V :

Software Reliability And Quality Management: Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model.

Computer Aided Software Engineering: Case and its Scope, Case Environment, Case Support in Software Life Cycle, Other Characteristics of Case Tools, Towards Second Generation CASE Tool, Architecture of a Case Environment.

Software Maintenance: Characteristics of Software Maintenance.

Software Reuse: what can be Reused? Why almost No Reuse So Far?, Basic Issues in Reuse Approach, Reuse at Organisation Level.

Text Books :

1. Software Engineering A practitioner's Approach, Roger S. Pressman, Seventh Edition McGrawHill International Edition.
2. Fundamentals of Software Engineering, Rajib Mall, Third Edition, PHI.

Reference Books :

1.Software Engineering, Ian Sommerville, Ninth edition, Pearson education.

2.Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008

3.Software Engineering, A Precise Approach, PankajJalote, Wiley India,2010.

4.Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.

5. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A50504	**Computer Networks**	2	2	-	3

COURSE OBJECTIVES	
1	Study the evolution of computer networks and future directions.
2	Study the concepts of computer networks from layered perspective.
3	Study the issues open for research in computer networks

COURSE OUTCOMES	
CO1	Ability to choose the transmission media depending on the requirements.
CO2	Ability to design new protocols for computer network.
CO3	Ability to configure a computer network logically.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓

UnitI

Introduction: Networks, Network Types, Internet History, Standards and Administration, Network Models: Protocol Layering, TCP/IP Protocol Suite, The ISO Model.

The Physical layer: Data and Signals, Transmission impairment, Data rate limits, Performance, Transmission media: Introduction, Guided Media, Unguided Media, Switching: Introduction, Circuit Switched Networks, Packet switching.

Unit II

The Data Link Layer: Introduction, Link layer addressing, Error detection and Correction: Cyclic codes, Checksum, Forward error correction, Data link control: DLC Services, Data link layer protocols, HDLC, Point to Point Protocol, Media Access control: Random Access, Controlled Access, Channelization, Connecting devices and virtual LANs: Connecting Devices.

Unit III

The Network Layer: Network layer design issues, Routing algorithms, Congestion control algorithms, Quality of service, Internetworking, The network layer in the Internet: IPV4 Addresses, IPV6, Internet Control protocol, OSPF, BGP, IP, ICMPv4, IGMP.

Unit IV

The Transport Layer: The Transport Service, Elements of Transport Protocols, Congestion Control, The internet transport protocols: UDP, TCP, Performance problems in computer networks, Network performance measurement.

Unit V

The Application Layer: Introduction, Client Server Programming, WWW and HTTP, FTP, e-mail, TELNET, Secure Shell, Domain Name System, SNMP.

Text Books:

1. "Data communications and networking", Behrouz A. Forouzan, Mc Graw Hill Education,5th edition, 2012.
2. "Computer Networks", Andrew S. Tanenbaum, Wetherall, Pearson,5th edition, 2010.

References:

1. Data Communication and Networks, Bhushan Trivedi, Oxford
2. "Internetworking with TCP/IP – Principles, protocols, and architecture- Volume 1, Douglas E. Comer, 5th edition, PHI
3. "Computer Networks", 5E, Peterson, Davie, Elsevier.
4. "Introduction to Computer Networks and Cyber Security", Chawan- Hwa Wu, Irwin, CRC Publications.
5. "Computer Networks and Internets with Internet Applications", Comer.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A50505a.	**Data Warehousing and Mining**	3	-	-	3

COURSE OBJECTIVES	
1	To know the basic concepts and principles of data warehousing and data mining
2	Learn pre-processing techniques and data mining functionalities
3	Learn and create multidimensional models for data warehousing
4	Study and evaluate performance of Frequent Item sets and Association Rules
5	Understand and Compare different types of classification and clustering algorithms

COURSE OUTCOMES	
CO1	Understand the basic concepts of data warehouse and data Mining
CO2	Apply pre-processing techniques for data cleansing
CO3	Analyze and evaluate performance of algorithms for Association Rules
CO4	Analyze Classification and Clustering algorithms

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

UNIT-I

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 a Data Warehouse System, Major issues in Data Mining.

Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT-II

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.

Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-Oriented Induction.

UNIT-III

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods.

UNIT-IV

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, Clustering HighDimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

UNIT-V

Mining Streams, Time Series and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Transactional Databases, Mining Sequence Patterns in Biological Data, Graph Mining, Social Network Analysis and Multi relational Data Mining, Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

TEXT BOOKS:

1. Data Mining: Concepts and Techniques, Jiawei Han and Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, Second Edition, 2006.

2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson Education.

REFERENCES:

1. Data Mining Techniques, Arun KPujari, Second Edition, Universities Press.

2. Data Warehousing in the Real World, Sam Aanhory& Dennis Murray Pearson EdnAsia.

3. Insight into Data Mining, K.P.Soman, S.Diwakar,V.Ajay, PHI,2008.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER

(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A50505b.	**COMPUTER GRAPHICS**	3	-	-	3

COURSE OBJECTIVES	
1	To develop, design and implement two and three dimensional graphical structures
2	To enable students to acquire knowledge Multimedia compression and animations
3	To learn Creation, Management and Transmission of Multimedia objects

COURSE OUTCOMES	
1	Ability to develop programs to control the content, structure and appearance of objects
2	Ability to design, organize and produce multimedia projects of all kinds

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓								

UNIT-I: 2D PRIMITIVES

Elements of pictures created in computer graphics – Graphics input primitives and devicesDrawing primitives in open GL and Basic open GL programming - open GL basic Graphicsprimitives – Output primitives – Line, Circle and Ellipse drawing algorithms – Attributes ofoutput primitives

UNIT-II :- 2D GEOMETRIC TRANSFORMATIONS

2D Viewing – Window-Viewport Transformation - Two dimensional Geometric transformations – Line, Polygon, Curve and Text clipping algorithms.

UNIT-III:3D CONCEPTS

Requirements to Design –Design Patterns – Logical Architecture – Package diagram – Designpatterns – Model, View, Control pattern – Detailed design – Object design with GRASP pattern– Detailed class diagram with Visibility

UNIT-IV :MULTIMEDIA BASICS

Introduction and definitions – applications – elements – Animations – Compression – Types of Compressions: Lossless – Lossy – Video compression – Image Compression – Audio compression – Data and file format standards – Multimedia data structures: KD Trees –R trees.

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UNIT-V: MULTIMEDIA AUTHORING AND APPLICATIONS

Creating interactive multimedia – Multimedia Authoring Systems – Multimedia Authoring Software Applications – Video On demand – Virtual Reality – Augmented Reality – Content based retrieval in digital libraries.

.

Text Books:

1. Donald D. Hearn, M. Pauline Baker and Warren Carithers, "Computer Graphics with OpenGL", Fourth Edition, Pearson Education, 2010.

2. Ze-Nian Li and Mark S.Drew, "Fundamentals of Multimedia", First Edition, Pearson Education, 2007.

REFERENCES:

1. F.S.Hill, "Computer Graphics using OPENGL", Second edition, Pearson Education, 2003.

2. Prabhat K Andleigh, Kiran Thakrar, "Multimedia systems design", First Edition, PHI, 2007.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A50505c.	**Principles of Programming Language**	3	-	-	3

COURSE OBJECTIVES	
1	To study various programming paradigms.
2	To provide conceptual understanding of High level language design and implementation.
3	To introduce the power of scripting languages

COURSE OUTCOMES	
CO1	Ability to select appropriate programming language for problem solving
CO2	Ability to design new programming language.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	

Unit I:

Introduction: Software Development Process, Language and Software Development Environments, Language and Software Design Models, Language and Computer Architecture, Programming Language Qualities, A brief Historical Perspective.

Syntax and Semantics: Language Definition, Language Processing, Variables, Routines, Aliasing and Overloading, Run-time Structure.

Unit II:

Structuring the data: Built-in types and primitive types, Data aggregates and type constructors, User-defined types and abstract data types, Type Systems, The type Structure of representative languages, Implementation Models

Unit III:

Structuring the Computation: Expressions and Statements, Conditional Execution and Iteration, Routines, Exceptions, Pattern Matching, Nondeterminism and Backtracking, Event-driven computations, Concurrent Computations
Structuring the Program: Software Design Methods, Concepts in Support of Modularity, Language Features for Programming in the Large, Generic Units

Unit IV:
Object-Oriented Languages: Concepts of Object-oriented Programming, Inheritances and the type system, Object-oriented features in programming languages

Unit V:
Functional Programming Languages: Characteristics of imperative languages, Mathematical and programming functions, Principles of Functional Programming, Representative Functional Languages, Functional Programming in C++
Logic and Rule-based Languages: "What" versus "how": Specification versus implementation, Principles of Logic Programming, PROLOG, Functional Programming versus Logic Programming, Rule-based Languages

Textbook:
1) "Programming Language Concepts", Carlo Ghezzi, Mehdi Jazayeri, WILEY Publications.Third Edition, 2014

Reference Textbooks:
1. Concepts of Programming Languages, Tenth Edition, Robert W. Sebesta, Pearson Education.
2. Programming Languages Principles and Paradigms, Second Edition, Allen B. Tucker, Robert E. Noonan, McGraw Hill Education.
3. Introduction to Programming Languages, Aravind Kumar Bansal, CRC Press.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER
(LAB)

Subject Code	Title of the Lab	L	T	P	C
17A50506	Software Engineering &Web Technologies Lab	-	1	3	2

COURSE OBJECTIVES	
1	The main objective is to learn group work and to gain practical experience with some software engineering methodologies, methods and supporting tools.
2	To create a fully functional website with MVC architecture. To develop an online Book store using we can sell books (Ex: amazon .com).

COURSE OUTCOMES	
CO1	Prepare Software Requirement Specification document.Analyze and translate a specification into a design.
CO2	Realize design practically, using an appropriate software engineering methodology.
CO3	Able to use modern engineering tools for specification, design, implementation, and testing.
CO4	Ability to apply object oriented concepts for programming and its use.
CO5	Practical WEB Development using java by using JDBC and ODBC connectivity.Implementation of servlets and PHP connectivity by using MYSQL applications
CO5	Learning how to use PHP in different operating systems with different editors like eclipse and net beans.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	

CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

Part A

List of Experiments:.

1. To Identify Project scope, Objectives and Infrastructure.

2. Develop a SRS Document using Rational Requisite Pro Tool. (This Lab is for mastering the software requirements in this regard the documents like Vision Document- Use Case Document – SRS Documents must be submitted for the Problem given to you)

3. Introduction to UML, To Develop Data Dictionary and Use case Diagram
4. To Develop Activity diagram and Class diagram
5. To Develop Sequence diagrams and Collaboration Diagram
6. To add interface to class diagram
7. To Develop Deployment diagram
8. Implement the design by coding
9. Writing a programs for the following : Quality Metrics and OO Metrics, Finding the coupling and cohesion intensity in java code, Reverse Engineering Problems
10. To Prepare test plan and perform validation testing
11. To perform Coverage analysis
12. To develop test case hierarchy
13. Web site Testing, Security Testing, System Testing.

References:

1. Rational Online Documentation
2. Booch, Jackobson and Rambaugh, UML Guide , Pearson Edu, 1999
3. IEEE Standards for SRS Documents, IEEE Std. 830.
4. Fenton NE, Software Metrics: A Rigorous Approach, Chapman and Hall, 1991

Part B

Hardware and Software required:

1. A working computer system with either Windows or Linux

2. A web browser either IE or Firefox
3. Apache web server or IIS Webserver
4. XML editor like Altova Xml-spy [www.Altova.com/**XML**Spy – free], Stylus studio, etc.,
5. A database either MySQL or Oracle
6. JVM (Java virtual machine) must be installed on your system
7. BDK(Bean development kit) must be also be installed

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**.

Top frame : Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description ofthese pages will be given below).
Left frame : At least four links for navigation, which will display the catalogue ofrespective links.
For e.g.: When you click the link **"CSE"** the catalogue for **CSE** Books should be displayed in the Right frame.
Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description ofthe web site.

<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
<tr><td>CSE
ECE
EEE
CIVIL</td><td colspan="4">Description ofthe Web Site</td></tr>
</table>

Fig 1.1

2) LOGIN PAGE:

This page looks like below:

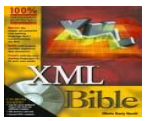
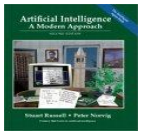
<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
<tr><td>CSE
ECE
EEE
CIVIL</td><td colspan="4">Login :
Passwor
Submit Reset</td></tr>
</table>

3) CATOLOGUE PAGE:

The catalogue page should contain the details ofall the books available in the web site in a table. The details should contain the following:

1.Snap shot ofCover Page.
2.Author Name.

3.Publisher.
4.Price.
5.Add to cart button.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	   	Book : XML Bible Author : Winston Publication : Wiely Book : AI Author : S.Russel Publication : Princeton hall Book : Java 2 Author : Watson Publication : BPB publications Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	$ 40.5 $ 63 $ 35.5 $ 50	Add to cart Add to cart Add to cart Add to cart

Note: Week 2 contains the remaining pages and their description.

Week-2:

4) CART PAGE:
The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
<tr><td>CSE
ECE
EEE
CIVIL</td><td colspan="4">Book name Price Quantity Amount

Java 2 $35.5 2 $70
XML bible $40.5 1 $40.5

Total amount - $130.5</td></tr>
</table>

5) REGISTRATION PAGE:

Create a "*registration form* "with the following fields
1) Name (Text field)
2) Password (password field)
3) E-mail id (text field)
4) Phone number (text field)
5) Sex (radio button)
6) Date ofbirth (3 select boxes)
7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
8) Address (text area)

WEEK 3:

VALIDATION:
Write *JavaScript* to validate the following fields ofthe above registration page.

6. Name (Name should contains alphabets and the length should not be less than 6 characters).
7. Password (Password should not be less than 6 characters length).
8. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

Week-4:

Design a web page using **CSS (C**ascading **S**tyle **S**heets**)** which includes the following:
1) Use different font, styles:
In the style definition you define how each selector should work (font, color etc.). Then, in the body ofyour pages, you refer to these selectors to activate the styles.
For example:

```
<HTML>
<HEAD>
<style type="text/css">
```

```
B.headline {color:red, font-size:22px, font-family:arial, text-
decoration:underline}
</style>

</HEAD>

<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}

For example:

<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>

<b class="headline">This is headline style bold</b>
</BODY>

</HTML>
```

2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif),}
```

3) Control the repetition ofthe image with the background-repeat property. As background-repeat: repeat Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.
4) Define styles for links as

A:link
A:visited
A:active
A:hover

Example:

```
<style type="text/css">
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline, color: red,}
</style>
```

5) Work with layers:

For example:

LAYER 1 ON TOP:

```
<div style="position:relative, font-size:50px, z-index:2,">LAYER 1</div><div
style="position:relative, top:-50, left:5, color:red, font-size:80px, z-

index:1">LAYER 2</div>
```

LAYER 2 ON TOP:

```
<div style="position:relative, font-size:50px, z-index:3,">LAYER 1</div><div
style="position:relative, top:-50, left:5, color:red, font-size:80px, z-

index:4">LAYER 2</div>
```

6) Add a customized cursor:

Selector {cursor:value}

For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

Week-5:

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

1) Title ofthe book
2) Author Name
3) ISBN number
4) Publisher name
5) Edition
6) Price

Write a Document Type Definition (DTD) to validate the above XML file.
Display the XML file as follows.
The contents should be displayed in a table. The header ofthe table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.
Use XML schemas XSL and CSS for the above purpose.
Note: Give at least for 4 books. It should be valid syntactically.
Hint: You can use some xml editors like XML-spy

Week-6:
VISUAL BEANS:
Create a simple visual bean with a area filled with a color.
The shape ofthe area depends on the property shape. If it is set to true then the shape ofthe area is Square and it is Circle, if it is false.
The color ofthe area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window ".

Week-7:

1) Install IIS web server and APACHE.

While installation assign port number 4040 to IIS and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.

Access the pages by using the urls : http://localhost:4040/rama/books.html (for tomcat)
http://localhost:8080/books.html (for Apache)

Week-8:

User Authentication :
Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a PHP for doing the following.
1. Create a Cookie and add these four user id's and passwords to this Cookie.

2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies.
If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display " You are not an authenticated user ''.
Use init-parameters to do this.

Week-9:
Install a database(Mysql or Oracle).
Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Write a PHP program to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.
Insert the details ofthe users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

Week-10:
Write a PHP which does the following job:
Insert the details ofthe 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to week8 instead of cookies).

Week-11:
Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount) ofeach category. Modify your catalogue page (week 2)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using PHP

Week-12:
HTTP is a stateless protocol. Session is required to maintain the state.
The user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead oflocalhost). This can be achieved through the use ofsessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method session.invalidate()).
Modify your catalogue and cart PHP pages to achieve the above mentioned functionality using sessions.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A50507	**Data Warehousing and Mining &Compiler Design Laboratory**	-	1	3	2

COURSE OBJECTIVES	
1	Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration and Pentaho Business Analytics),
2	Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA).Understand the data sets and data preprocessing,
3	Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering and regression
4	To implement some of the functionality of the compiler
5	To do programming using compiler related tools

COURSE OUTCOMES	
CO1	Ability to build Data Warehouse and Explore WEKA
CO2	Ability to perform data preprocessing tasks and Demonstrate performingclassification, clustering and regression association rule mining on data sets
CO3	Develop compiler tools
CO4	Design simple compiler

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓	✓						✓	✓	

Experiments:

1.Build Data Warehouse and Explore WEKA

A. Build a Data Warehouse/Data Mart (using open source tools like Pentaho Data Integration tool, Pentoaho Business Analytics; or other data warehouse tools like Microsoft-SSIS, Informatica, Business Objects, etc.).

(i). Identify source tables and populate sample data

(ii). Design multi-dimensional data models namely Star, snowflake and Fact constellation schemas for any one enterprise (ex. Banking, Insurance, Finance, Healthcare, Manufacturing, Automobile, etc.).

(iii). Write ETL scripts and implement using data warehouse tools

(iv). Perform various OLAP operations such slice, dice, roll up, drill up and pivot

(v). Explore visualization features of the tool for analysis like identifying trends etc.

2.Perform data preprocessing tasks and Demonstrate performing association rule mining on data sets

A. Explore various options available in Weka for preprocessing data and apply (like Discretization Filters, Resample filter, etc.) on each dataset

B. Load each dataset into Weka and run Aprori algorithm with different support and confidence values. Study the rules generated.

C. Apply different discretization filters on numerical attributes and run the Apriori association rule algorithm. Study the rules generated. Derive interesting insights and observe the effect of discretization in the rule generation process.

3.Demonstrate performing classification on data sets

A. Load each dataset into Weka and run Id3, J48 classification algorithm. Study the classifier output. Compute entropy values, Kappa statistic.

B. Extract if-then rules from the decision tree generated by the classifier, Observe the confusion matrix and derive Accuracy, F-measure, TPrate, FPrate, Precision and Recall values. Apply cross-validation strategy with various fold levels and compare the accuracy results.

C. Load each dataset into Weka and perform Naïve-bayes classification and kNearest Neighbour classification. Interpret the results obtained.

D. Plot RoC Curves

E. Compare classification results of ID3, J48, Naïve-Bayes and k-NN classifiers for each dataset, and deduce which classifier is performing best and poor for each dataset and justify.

4.Demonstrate performing clustering on data sets

A. Load each dataset into Weka and run simple k-means clustering algorithm with different values of k (number of desired clusters). Study the clusters formed. Observe the sum of squared errors and centroids, and derive insights.

B. Explore other clustering techniques available in Weka.

C. Explore visualization features of Weka to visualize the clusters. Derive interesting insights and explain.

5.Demonstrate performing Regression on data sets

A. Load each dataset into Weka and build Linear Regression model. Study the clusters formed. Use Training set option. Interpret the regression model and derive patterns and conclusions from the regression results. x

B. Use options cross-validation and percentage split and repeat running the Linear Regression Model. Observe the results and derive meaningful results.

C. Explore Simple linear regression technique that only looks at one variable

6. Hospital Management System

Data Warehouse consists Dimension Table and Fact Table.

REMEMBER The following Dimension

The dimension object (Dimension):

_ Name

_ Attributes (Levels) , with one primary key

_ Hierarchies

One time dimension is must.

About Levels and Hierarchies

Dimension objects (dimension) consist of a set of levels and a set of hierarchies defined over those levels. The levels represent levels of aggregation. Hierarchies describe parent-child relationships among a set of levels.

For example, a typical calendar dimension could contain five levels. Two hierarchies can be defined on these levels:

H1: YearL > QuarterL > MonthL > WeekL > DayL

H2: YearL > WeekL > DayL

The hierarchies are described from parent to child, so that Year is the parent of Quarter, Quarter the parent of Month, and so forth.

About Unique Key Constraints

When you create a definition for a hierarchy, Warehouse Builder creates an identifier key for each level of the hierarchy and a unique key constraint on the lowest level (Base Level)

Design a Hospital Management system data warehouse (TARGET) consistig of Dimensions Patient, Medicine, Supplier, Time. Where measures are _ NO UNITS‘, UNIT PRICE.

Assume the Relational database (SOURCE) table schemas as follows

TIME (day, month, year),

PATIENT (patient_name, Age, Address, etc.,)

MEDICINE (Medicine_Brand_name, Drug_name, Supplier, no_units, Uinit_Price, etc.,)
SUPPLIER :(Supplier_name, Medicine_Brand_name, Address, etc.,) If each Dimension has 6 levels, decide the levels and hierarchies, Assume the level names suitably.
Design the Hospital Management system data warehouse using all schemas. Give the example 4-D cube with assumption names.

Resource Sites:

1. http://www.pentaho.com/

2. http://www.cs.waikato.ac.nz/ml/weka/

Compiler Design Programs

List of Experiments:

1.Write a program to search for a given pattern in a set of files. It should support regular expressions. It should work similar to grep and fgrep of Linux environment.

2.Write programs to implement DFA and NFA.(Input : DFA or NFAand a string and Output : Verification of any given string for acceptance.)

3.Design a PDA for any given CNF. Simulate the processing of a string using the PDA and show the parse tree.

4.Design a Lexical analyzer for identifying different types of tokens used in C language.

Note: The reserved keywords such as if, else, class, structetc must be reported as invalid identifiers. C allows identifier names to begin with underscore character too.

5.Program to recognize the identifiers, if and switch statements of C using a lexical analyzer generator tool.

6. Consider the following grammar:

S --> ABC

A-->abA | ab

B--> b | BC

C--> c | cC

Design any shift reduced parser which accepts a string and tells whether the string is accepted by above grammar or not.

7.YACC program that reads the input expression and convert it to post fix expression.

References:

1."Compiler Design using FLEX and YACC", Das, PHI.

2. "Compiler Design in C", Holub, PHI.

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****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A60501	**Data Analytics**	2	2	-	3

COURSE OBJECTIVES	
1	To introduce the terminology, technology and its applications
2	To introduce the concept of Analytics for Business
3	To introduce the tools, technologies & programming languages which is used in day to day analytics cycle

COURSE OUTCOMES	
CO1	Analyze data, test claims, and draw valid conclusions using appropriate statistical methodology.
CO2	Use appropriate resources to research, develop and contribute to advances and trends within the field of Data Analytics.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	

Unit -1

Introduction to R: Introduction to R, Calculating Environment, Basic Programming, Input and Output, Functions, Data Structures, String handling

Unit - 2

Data Importing and Exporting: Reading Data from Files, Data Normalization, Relational

Databases, Merging, Combining and subletting datasets, working with Binary and Image Files, Installing Packages.

Unit 3

Data Analysis: Data Types, Matrices, Data Frames, Importing and exporting Data, apply, lapply, sapply, mapply, split and tapply functions, ddply.

Unit -4

Data Visualization: Exploring Data, Scatter Plots, Line Graphs, Bar Graphs, Histograms, Box Plots,Pie charts, points, Using Color in plots, Facets, Summarized Data Distributions.

Unit -5

Probability and Statistics: Data Description, Probability, Distributions -Discrete and Continuous Distributions, Sample Distributions, Hypothesis testing, Regression Models – Linear and Multiple Regression models.privacy, security, ethics, A look back at Data Science, Next-generation data scientists.

Text Books:

1. Introduction to Scientific Programming and Simulation Using R, Owen Jones, Robert Maillardet and Andrew Robinson, Second Edition, CRC Press, 2014
2. A First Course in Statistical Programming with R, Braun W. J., Murdoch D. J.. — Cambridge University Press, 2007
3. Data Manipulation with R, Jaynal Abedin and Kishor Kumar Das, Second Edition, Packt publishing, BIRMINGHAM – MUMBAI.
4. Beginning R The Statistical Programming language- Mark Gardener, John Wiley & Sons, Inc, 2012

Reference Books:

1. Graphics for Statistics and Data Analysis with R – Kevin J. Keen, CRC Press, 2010
2. Data Analysis and Graphics Using R, Third Edition, John Maindonald, W. John Braun, Cambridge University Press, 2010
3. Exploratory Data Analysis with R – Roger D. Peng, Leanpub publications, 2015
4. Introduction to Probability and Statistics Using R, G. jay Kerns, First Edition, 2011
5. The Art of Data Science- A Guide for anyone Who Works with Data – Roger D. Peng and Elizabeth Matsui, Leanpub Publications, 2014

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – II SEMESTER

(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A60502	**OBJECT ORIENTED ANALYSIS AND DESIGN**	3	-	-	3

COURSE OBJECTIVES	
1	To understand how to solve complex problems
2	Analyze and design solutions to problems using object oriented approach
3	Study the notations of Unified modeling language

COURSE OUTCOMES	
CO1	Find solutions to the complex problems using object oriented approach
CO2	Represent classes, responsibilities and states using UML notation
CO3	• Identify classes and responsibilities of the problem domain

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓

UNIT-I: OOAD BASICS

Introduction – Overview of object oriented system development – Object basics-The Unified

Process – Modelling concepts – Modelling as a design technique – Analysis and modelling –

UML diagrams – Use case Modelling – Class modelling – State modelling – Interaction Modelling

UNIT-II :REQUIREMENTS& MODELING

Object Constraint Language - Inception – Evolutionary Requirements– Domain Models –

System Sequence Diagrams – Operation Contracts.

UNIT-III:PRINCIPLES OF DESIGNING

Requirements to Design –Design Patterns – Logical Architecture – Package diagram – Design patterns – Model, View, Control pattern – Detailed design – Object design with GRASP pattern– Detailed class diagram with Visibility

UNIT-IV :MAPPING TO CODE

Mapping designs to code – Test Driven development and refactoring – UML Tools and UML as blueprint.

Case Studies – the Next Gen POS system, Online Bookshop - A Multi Threaded Airport Simulation.

UNIT-V: APPLYING DESIGN PATTERNS

More Patterns – Analysis update – Objects with responsibilities – Applying design patterns – Architectural Analysis – Logical Architecture Refinement – Package Design –Persistence framework with patterns.

Text Books:

11. Michael Blaha and James Rumbaugh, "Object-oriented modelling and design with UML", Prentice-Hall of India, 2005.

2. Craig Larman. "Applying UML and Patterns – An introduction to Object-Oriented Analysis and Design and Iterative Development", 3rd ed, Pearson Education, 2005.

REFERENCES:

1. Ali Bahrami, "Object Oriented Systems Development", McGraw-Hill, 1999.

2. Booch, Grady. Object Oriented Analysis and Design. 2nd ed. Pearson Education 2000.

3. Fowler, Martin. UML Distilled. 3rd ed. Pearson Education. 2004.

4. Lunn, Ken. Software development with UML. Palgrave Macmillan. 2003.

5. O'Docherty, Mike. Object-Oriented Analysis & Design. Wiley. 2005

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
DEPARTMENT OF ECE
III B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A624501	**Microprocessors & Microcontrollers**	3	-	-	3

COURSE OBJECTIVES	
The students will be able to	
1	Understand fundamental operating concepts behind microprocessors and microcontrollers.
2	Appreciate the advantages in using RISC microprocessors / microcontrollers in engineering applications.
3	Design microprocessor / microcontroller based solutions to problems.
5	Develop skill in simple program writing for 8086; MSP430 and applications.

COURSE OUTCOMES	
At the end of this course the student will be able to,	
CO1	Understands the internal architecture and organization of 8085 &8086 processors, MSP430 controller.
CO2	Design and implement programs on 8086 microprocessor.
CO3	Understands the interfacing techniques to 8086 and MSP 430 and can develop assembly language programming to design microprocessor/ micro controller based systems.
CO4	Program MSP 430 for designing any basic Embedded System.
CO5	Design and implement some specific real time applications.

SYLLABUS

UNIT I

Introduction-8085 Architecture-Block Diagram, Flag Register, Pin Diagram, Timing and Control Signals, System Timing Diagram, Overview of 8086-Internal Architecture- Register Organization, Memory Segmentation, Flag Register, Pin Configuration. Interrupt structure of 8085 and 8086

UNIT II

Instruction Formats -Addressing Modes-Instruction Set of 8086, Assembler Directives-Macros and Procedures. Programs Involving Logical, Branch Instructions – Sorting and Evaluating

Arithmetic Expressions – StringManipulations-Simple ALPs. Brief discussion of peripheral sub systems like 8251, 8253, 8255, 8257 and 8259 (only Pin diagrams and key features of these peripheral sub systems)

UNIT III

Comparison between RISC and CISC architecture, Low power RISC MSP430 – block diagram, features and architecture,Variants of the MSP430 family viz. MSP430x2x, MSP430x4x, MSP430x5x and their targeted applications, MSP430x5x series block diagram, address space, on-chip peripherals (analog and digital), and Register sets. Sample embedded system on MSP430 microcontroller.

UNIT-IV

I/O ports pull up/down registers concepts, Interrupts and interrupt programming. Watchdog timer. System clocks. Low Power aspects of MSP430: low power modes, Active vs Standby current consumption, FRAM vs Flash for low power & reliability.

Timer & Real Time Clock (RTC), PWM control, timing generation and measurements. Analog interfacing and data acquisition: ADC and Comparator in MSP430, data transfer using DMA.

Case Study: MSP430 based embedded system application using ADC & PWM demonstrating peripheral intelligence. "Remote Controller of Air Conditioner Using MSP430"

UNIT-V:

Serial communication basics, Synchronous/Asynchronous interfaces (like UART, USB, SPI, and I2C). UART protocol, I2C protocol, SPI protocol. Implementing and programming UART, I2C, SPI interface using MSP430, Interfacing external devices. Implementing Embedded Wi-Fi using C3100

Case Study: MSP430 based embedded system application using the interface protocols for communication with external devices: "A Low-Power Battery less Wireless Temperature and Humidity Sensor with Passive Low Frequency RFID"

Text Books:

1. "Microprocessor and Microcontrollers", N. Senthil Kumar, M. Saravanan, S. Jeevanathan,
   Oxford Publishers. 1 st Edition, 2010
2. "The X86 Microprocessors , Architecture, Programming and Inerfacing" , Lyla B. Das, Pearson
   Publications, 2010
3. MSP430 microcontroller basics. John H. Davies, Newnes Publication, I st Edition

References:

http://processors.wiki.ti.com/index.php/MSP430_LaunchPad_Low_Power_Mode
http://processors.wiki.ti.com/index.php/MSP430_16-Bit_Ultra Low_Power_MCU_Training

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III B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A60503	**ARTIFICIAL INTELLIGENCE**	3	-	-	3

COURSE OBJECTIVES	
1	To learn the basics of designing intelligent agents that can solve general purpose problems, represent and process knowledge, plan and act, reason under uncertainty and can learn from experiences.

COURSE OUTCOMES	
CO1	Select a search algorithm for a problem and estimate its time and space complexities.
CO2	Possess the skill for representing knowledge using the appropriate technique for a given problem
CO3	Possess the ability to apply AI techniques to solve problems of game playing, expert systems, machine learning and natural language processing.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√				√		√	√	√		√
CO2	√			√	√		√		√		√	
CO3		√		√	√	√	√		√	√	√	√

UNIT I
PROBLEM SOLVING
Introduction – Agents – Problem formulation – uninformed search strategies – heuristics – informed search strategies – constraint satisfaction

UNIT II
LOGICAL REASONING

Logical agents – propositional logic – inferences – first-order logic – inferences in firstorder logic – forward chaining – backward chaining – unification – resolution

UNIT III
PLANNING
Planning with state-space search – partial-order planning – planning graphs – planning and acting in the real world

UNIT IV
UNCERTAIN KNOWLEDGE AND REASONING
Uncertainty – review of probability - probabilistic Reasoning – Bayesian networks – inferences in Bayesian networks – Temporal models – Hidden Markov models.

UNIT V
LEARNING
Learning from observation - Inductive learning – Decision trees – Explanation based learning – Statistical Learning methods - Reinforcement Learning

TEXT BOOK:
1. S. Russel and P. Norvig, "Artificial Intelligence – A Modern Approach", Second Edition, Pearson Education, 2003.

REFERENCES:
1. David Poole, Alan Mackworth, Randy Goebel, "Computational Intelligence : a logical approach", Oxford University Press, 2004.
2. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem solving", Fourth Edition, Pearson Education, 2002.
3. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers, 1998.

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****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A60504a.	**FREE AND OPEN SOURCE SOFTWARES**	3	-	-	3

COURSE OBJECTIVES	
1	Exposure to the context and operation of free and open source software (FOSS) communities and associated software projects.
2	Familiar with participating in a FOSS project
3	Learn scripting language like Python or Perl
4	Learn programming language like Ruby
5	Learn some important FOSS tools and techniques

COURSE OUTCOMES	
CO1	Install and run open-source operating systems.
CO2	Gather information about Free and Open Source Software projects from software releases and from sites on the Internet.
CO3	Build and modify one or more Free and Open Source Software packages.
CO4	Contribute software to and interact with Free and Open Source Software development projects.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				✓		✓		✓		✓	✓	
CO2			✓		✓							
CO3		✓		✓			✓			✓		
CO4				✓		✓		✓		✓	✓	

UNIT I PHILOSOPHY

Notion of Community--Guidelines for effectively working with FOSS community--, Benefits of Community based Software Development --Requirements for being open, free software, open source software –Four degrees of freedom - FOSS Licensing Models - FOSS Licenses – GPL- AGPL- LGPL - FDL - Implications – FOSS examples.

UNIT II LINUX

Linux Installation and Hardware Configuration – Boot Process-The Linux Loader (LILO) - The Grand Unified Bootloader (GRUB) - Dual-Booting Linux and other Operating System - Boot-Time Kernel Options- X Windows System Configuration-System Administration – Backup and Restore Procedures- Strategies for keeping a Secure Server.

UNIT III PROGRAMMING LANGUAGES

Programming using languages like Python or Perl or Ruby

UNIT IV PROGRAMMING TOOLS AND TECHNIQUES

Usage of design Tools like Argo UML or equivalent, Version Control Systems like Git or equivalent, –

Bug Tracking Systems- Package Management Systems

UNIT V FOSS CASE STUDIES

Open Source Software Development - Case Study – Libreoffice -Samba

REFERENCES:

Philosophy of GNU URL: http://www.gnu.org/philosophy/.

Linux Administration URL: http://www.tldp.org/LDP/lame/LAME/linux-admin-made-easy/.

The Python Tutorial available at http://docs.python.org/2/tutorial/.

Perl Programming book at http://www.perl.org/books/beginning-perl/.

Ruby programming book at http://ruby-doc.com/docs/ProgrammingRuby/.

Version control system URL: http://git-scm.com/.

Samba: URL :http://www.samba.org/.

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****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A60504b.	**Intellectual Property Rights**	3	-	-	3

COURSE OBJECTIVES	
1	Understanding of the fundamental legal principles relating to confidential information, copyright, patents, designs, trademarks and unfair competition
2	ability to identify, apply and assess principles of law relating to each of the areas of intellectual property

COURSE OUTCOMES	
CO1	Able to demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing
CO2	Able to anticipate and subject to critical analysis of arguments relating to the development and reform of intellectual property right institutions and their likely impact on creativity and innovation.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	

Unit-1

Introduction to Intellectual property law : Intellectual property law basics, Types of intellectual property, Agencies Responsible for Intellectual property Registration, International Organizations, Agencies and Treaties, The Increasing Importance of Intellectual property Rights.

Foundations of Trademark Law : Introduction, Purpose of Trademarks, Types of Marks, Acquisition of Trademark Rights, common Law Rights, Federal Registration under the Lanham Act, Laws and Treaties Governing Trademarks, and State Trademark Rights, Categories of

Marks, Trade Names and Business Name, Protectable Matter, Protectable Matter, Exclusions from Trademark Protection, U.S. Patent and Trademark Office.

Trademark Selection and Searching: Selection and Evaluating a Mark, The Trademark Search.

The Trademark Registration Process: Preparing the Application, Drawing of Mark, Filing the Application, Docketing Critical Dates, and Initial Role of the U.S. Patent and Trademark Office, The Examinations Process, Post examination Procedure, Registration, The U.S. Patent and Trademark Office's TARR Monitoring System.

Unit-2

Postregistration Procedures, Trademark Maintenance, and Transfer of Rights to Marks: The Affidavit of Use,The Affidavit of Incontestability, Renewal of Registration, Docketing Requirements, Loss of Trademark Rights, Trademark Use and Compliance Policies, Trademark Policing and Maintenance, Use of Mark Owned by Third Parties, Transfer of Ownership or Rights in Trademarks.

Inter Partes Proceedings, Infringement, and Dilution: Inter Partes Proceedings, Infringement of Trademark, Dilution of Trademarks, Related Trademark Claims.

New Developments in Trademark Law: The Internet, Protecting a Domain Name, Hyperlinking and the Frist Amendment, Other Cyberspace Trademark Issues.

International Trademark Law: Applications in the United States Based in Foreign Applications and Registration, Securing Trademark Protection in Foreign Countries, Effects of New International Agreements, International Associations.

UNIT-3

Foundations of Copyright Law: Introduction, Common Law Rights under the 1976 Copyright Act, the U.S. Copyright Office.

The Subject Matter of Copyright: Introduction, Originality of Material, Fixation of Material, Work of Authorship, Exclusions from Copyright Protection, Compilation, Collections, and Derivative Works.

Right Afforded by Copy right Law: Introduction, Rights of Reproduction, Rights to Prepare Derivative works, Rights of Distribution and the First Sale Doctrine, Rights to perform the work Publicly, Rights to display the work Publicly, Other Limitations on Exclusive Rights, Moral Rights and the Visual Artists Rights act, Compulsory Licenses.

Copyright Ownership, Transfers, and Duration: Copyright Ownership Issues, Joint Works, Ownership in derivative or Collective works, Works made for Hire, Transfers of copyright, Termination of Transfers of copyright Rights, Duration of Copyright.

Unit-4

Copyright Registration, Searching copyright Office Records and Notice of Copyright : Introduction, The Application for copyright Registration, Deposit Material, The Application Process and Registration of Copyright, Preregistration , Searching copyright Office Records, Obtaining copyright office Records and deposit Materials, Copyright Notice.

Copyright Infringement: Introduction, Elements of Infringement, Contributory infringement and vicarious Infringement, Defences to Infringement, Infringement Actions.

New Developments in Copyright Law and the Semiconductor Chip Protection Act : Introduction, Copyright Protection for Computer Programs, Copyright Protection for Automated Databases, Copyright in the Electronic Age, The digital Millennium Copyright Act, Entertainment notes, Recent Developments in Copyright Law, Terms of the Trade, Vessel Hull Protection , Semiconductor Chips Protection.

International Copyright Law: Introduction, The Berne Convention, Treaties Supplementing the BerneConvention: The WIPO Treaties, The Uruguay Round Agreements Act, The universal copyright convention, Trades Aspects of Intellectual Property Law, Gray Market Goods, Summary of US Relations with Foreign Nations.

Unit-5

The Law of Patents : Introduction, Rights under Federal Law, U.S Patent and Trademark Office, Patentability, Design Patent, Plant Patents, Double Patenting, The Orphan Drug Act.

Patent Searches, Applications, And Post-issuance proceeding : Patent Searching, The Patent Application Process, Prosecuting the Application, Post-Issuance Actions, Term and Maintenance of Patents, Patent Ownership and Transfer : Ownership Rights, Sole and Joint Inventors, Disputes over Inventorship, Inventions Made by Employees and Independent Contractors, Assignment of Patent Rights, Licensing of Patent Rights, Invention Developers and Promoters.

Patent Infringement : Direct Infringement, Inducement to Infringe and contributory Infringement, The first Sale Doctrine, Imports and Section 337 investigations, Indirect Infringement, Infringement Abroad, Claims interpretation, Defenses to Infringement, Remedies for Infringement, Resolving an Infringement Dispute, Patent Infringement Litigation.

New Developments and International Patent Law : New Developments in patent law, Introduction to International Patent Protection, The Paris convention, the patent cooperation Treaty , The European Patent organization, The patent Prosecution Highway , Agreement on

trade- Related Aspects of Intellectual Property rights, The patent Law Treaty, Foreign filling Licences, Applications for US Patents by Foreign Applications.

Trade Secrets Law: Introduction, Determination of Trade Secret Status, Liability for Misappropriation of Trade Secrets, Employer – employee Relationship, Protection for Submission, Defenses to Trade Secrets misappropriation, Remedies for misappropriation, Trade Secret litigation , Trade Secret Protection Programs, new and International development in Trade Secret Law.

Unfair competition: Introduction, Passing Off, misappropriation, Right of publicly, false advertising, product disparagement, dilution, Infringement of trade dress, International production against unfair competitions.

Intellectual property Audits and give Diligence Reviews: Introduction, Practical Aspects of Intellectual property audits, conducting the Audit, Postaudit activity.

Text Book:

1) Intellectual Property the Law of Trademarks, Copyrights, Patents, and Trade Secrets 4th Edition by Deborah E. Bouchoux, Cengage Learning,2013.

Reference Text Books:

1) "Intellectual Property Rights" by paruddha ganguli, Mc Graw Hill Educton

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A60504c.	**Data Science**	3	-	-	3

COURSE OBJECTIVES	
1	Discussion and dissemination of best practice in use of data science.
2	Aims to bring to together researchers interested in data science to focus on techniques and methods that cut across all disciplines.
3	DSC will bring together researchers that develop methods and techniques and those that apply these methods to their research.
4	Will be used to raise awareness of funding opportunities (nationally and internationally) and potential collaborations related to the use of data analytics/big data techniques.
5	Will be led by a small academic steering group to ensure alignment with current academic topics.

COURSE OUTCOMES	
CO1	Use R to carry out basic statistical modeling and analysis.
CO2	Explain the significance of exploratory data analysis (EDA) in data science. Apply basic tools (plots, graphs, summary statistics) to carry out EDA.
CO3	Describe the Data Science Process and how its components interact.
CO4	Use APIs and other tools to scrap the Web and collect data.
CO5	Apply EDA and the Data Science process in a case study.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓							✓	
CO2	✓		✓			✓			✓			✓
CO3		✓		✓							✓	
CO4						✓		✓				
CO5					✓		✓			✓		

UNIT-I

Introduction: What is Data Science: Big Data and Data Science hype – and getting past the hype, Why now? – Deification, Current landscape of perspectives, Skill sets needed.

Statistical Inference: Populations and samples, Statistical modeling, probability distributions, fitting a model, Intro to R.

UNIT-II

Exploratory Data Analysis and the Data Science Process: Basic tools (plots, graphs and summary statistics) of EDA**,** Philosophy of EDA, The Data Science Process, Case Study: Real Direct (online real estate firm)

Three Basic Machine Learning Algorithms: Linear Regression, k-Nearest Neighbors (k-NN),k-means.

UNIT-III

One More Machine Learning Algorithm and Usage in Applications: Motivating application: Filtering Spam, Why Linear Regression and k-NN are poor choices for Filtering Spam, Naive Bayes and why it works for Filtering Spam, Data Wrangling: APIs and other tools for scrapping the Web.

Feature Generation and Feature Selection (Extracting Meaning From Data) : Motivating application: user (customer) retention, Feature Generation (brainstorming, role of domain expertise, and place for imagination),Feature Selection algorithms, Filters; Wrappers; Decision Trees; Random Forests.

UNIT-IV

Recommendation Systems: Building a User-Facing Data Product: Algorithmic ingredients of a Recommendation Engine, Dimensionality Reduction, Singular Value Decomposition,

Principal Component Analysis.

Mining Social-Network Graphs: Social networks as graphs, Clustering of graphs, direct discovery of communities in graphs, Partitioning of graphs, Neighborhood properties in graphs.

UNIT-V

Data Visualization: Basic principles, ideas and tools for data visualization, Examples of inspiring (industry) projects.

Data Science and Ethical Issues: Discussions on privacy, security, ethics**,** a look back at Data Science, Next-generation data scientists.

Text Books:

1) Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk from the Frontline. O'Reilly. 2014.

Reference Books:

1) Jure Leskovek, Anand Rajaraman and Jeffrey Ullman. Mining of Massive Datasets. v2.1,Cambridge University Press. 2014. (free online)
2) Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. ISBN 0262018020. 2011
3) Foster Provost and Tom Fawcett. Data Science for Business: What You Need to Know aboutData Mining and Data-analytic Thinking. ISBN 1449361323. 2013

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES ******
III B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A69901	**French(Foreign Language)**	2	-	-	-

COURSE OBJECTIVES	
1	To be able to understand frequently used phrases and expressions in French related to relevant areas of experience.
2	To be able to carry out simple, habitual daily tasks and exchanges in French.
3	To be able to describe in French, in simple terms, their past, their environment and issues related to their immediate needs.

COURSE OUTCOMES	
CO1	Respond appropriately to simple statements and instructions in French in everyday situations, for example, questions and directions;
CO2	Participate in conversations based on everyday topics and respond orally in everyday situations in a manner acceptable to native speakers;
CO3	Equipped with sufficient vocabulary to operate in familiar and predictable situations.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

SYLLABUS

UNIT I:**Everyday activities-** Home life and school- Home life- School routine

Food, health and fitness- Eating and drinking- Health and fitness

UNIT II: **Personal and social life-** Self, family and personal relationships- Self, family, pets, personal- relationships- Holidays and special occasions- Festivals and special occasions- Holidays; getting around

UNIT III: **The world around us-** Home town and local area- Home town and geographical-surroundings- Natural and made environment- Natural environment- Weather- People, places and customs

UNIT IV: **The world of work-** Continuing education- Careers and employment- Language and communication in the work place

UNIT V: **The international world-** Tourism at home and abroad- Holiday travel and transport- Life in other countries and communities- Places and customs- World events and issues- Issues according to available resources and individual interest

Text Books:

References:

Method of Evaluation:
Please mention if it is apart from the regular practice

Signature

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES ******
III B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A69901	**Spanish(Foreign Language)**	2	-	-	-

COURSE OBJECTIVES	
1	to be able to understand frequently used phrases and expressions in Spanish related to relevant areas of experience.
2	to be able to carry out simple, habitual daily tasks and exchanges in Spanish.
3	to be able to describe in Spanish, in simple terms, their past, their environment and issues related to their immediate needs.

COURSE OUTCOMES	
CO1	respond appropriately to simple statements and instructions in Spanish in everyday situations, for example, questions and directions;
CO2	participate in conversations based on everyday topics and respond orally in everyday situations in a manner acceptable to native speakers;
CO3	equipped with sufficient vocabulary to operate in familiar and predictable situations.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

SYLLABUS

UNIT I:**Everyday activities-** Home life and school- Home life- School routine

Food, health and fitness- Eating and drinking- Health and fitness

UNIT II: **Personal and social life-** Self, family and personal relationships- Self, family, pets, personal- relationships- Holidays and special occasions- Festivals and special occasions- Holidays; getting around

UNIT III: **The world around us-** Home town and local area- Home town and geographical-surroundings- Natural and made environment- Natural environment- Weather- People, places and customs

UNIT IV: **The world of work-** Continuing education- Careers and employment- Language and communication in the work place

UNIT V: **The international world-** Tourism at home and abroad- Holiday travel and transport- Life in other countries and communities- Places and customs- World events and issues- Issues according to available resources and individual interest

Text Books:

References:

Method of Evaluation:
Please mention if it is apart from the regular practice

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT COMPUTER SCIENCE & ENGINEEIRNG ******
III B.TECH – II SEMESTER
Advanced English Language Communication Skills Lab
(w.e.f Academic Year 2017-18)

Subject Code	Title of the Lab	L	T	P	C
17A65501	Advanced English Language Communication Skills Lab	-	1	3	2

COURSE OBJECTIVES	
1	To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
2	Further, they would be required to communicate their ideas relevantly and coherently in writing.
3	To prepare all the students for their placements.
4	To initiate them into greater use of the computer in resume preparation, report writing, format making etc.
5	To train them to use language effectively to face interviews, group discussions, public speaking.

COURSE OUTCOMES	
CO1	Accomplishment of sound vocabulary and its proper use contextually
CO2	Flair in Writing and felicity in written expression.
CO3	Effective Speaking Abilities for enhanced job prospects.
CO4	Able to use technology to enhance job oppurtunities
CO5	Develop language competency and become confident users of English in interviews, Group Discussions, and Public Speaking

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

UNIT-I: COMMUNICATIVE COMPETENCY

1. Reading Comprehension
2. Listening comprehension
3. Vocabulary for competitive purpose
4. Spotting errors

UNIT-II: TECHNICAL WRITING

1. Report writing
2. Curriculum vitae
3. E-mail writing
4. Abstract & Synopsis Writing
5. Reviewing (Book/Film)

UNIT-III: PRESENTATIONAL SKILLS

1. Oral presentation
2. Power point presentation
3. Poster presentation
4. Stage dynamics
5. Body Language

UNIT-IV: CORPORATE SKILLS

1. Telephonic skills
2. Net Etiquettes
3. SMART Goal setting
4. Time Management
5. Negotiation Skills

UNIT-V: GETTING READY FOR JOB

1. Group discussions-II
2. Interview skills
3. Answering Strategies
4. Mock Interviews

MINIMUM REQUIREMENT FOR ELCS LAB:

The Advanced Communication Skills (ACS) Laboratory shall have the following infra-structural facilities to accommodate at least 60 students in the lab:

- Spacious room with appropriate acoustics.
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo & Camcorder
- Headphones of High quality

SUGGESTED SOFTWARE:

10. Walden Infotech English Language Communication Skills.
11. Clarity Pronunciation Power – Part I (Sky Pronunciation)
12. Clarity Pronunciation Power – part II
13. LES(Learn English Select) by British council
14. TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
15. *DELTA's key to the Next Generation TOEFL Test: Advanced Skills Practice.*
16. Lingua TOEFL CBT Insider, by Dreamtech
17. English Pronunciation in Use (Elementary, Intermediate, Advanced) CUP
18. Cambridge Advanced Learners' English Dictionary with CD.

REFERENCE BOOKS:

The software consisting of the prescribed topics elaborated above should be procured and used.

1. **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
2. **TOEFL & GRE**(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
3. **Train2success.com**

1. **Objective English for Competitive Exams**, Hari Mohana Prasad, 4th edition, Tata Mc Graw Hill.
2. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, O U Press 2009.
3. Books on **TOEFL/GRE/GMAT/CAT/IELTS** by Barron's/DELTA/Cambridge University Press.2012.
4. **Soft Skills for Everyone,** Butterfield Jeff, Cengage Publications, 2011.
5. **Practice Psychometric Tests**: How to familiarize yourself with genuine recruitment tests, 2012.
6. **Management Shapers Series** by Universities Press (India) Pvt Ltd., Himayatnagar, Hyderabad 2008.
7. **Handbook for Technical Writing** by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.

8. **English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hill 2009.**
9. **Word Power Made Handy,** Shalini Verma, S Chand Publications, 2011.
10. **Effective Technical Communication,** Ashrif Rizvi, TataMcGrahill, 2011.

Method of Evaluation:

English Language Laboratory Practical Examination:

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

2. For the Language lab sessions, there shall be a continuous evaluation during the year for 40 sessional marks and 60 year-end Examination marks. Of the 40 marks, 20 marks shall be awarded for day-to-day work and 20 marks to be awarded by conducting Internal Lab Test(s). The year- end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
DEPARTMENT OF ECE
III B.TECH – II SEMESTER (CSE)

Subject Code	Title of the Lab	L	T	P	C
17A624502	Microprocessors & Microcontrollers Lab	-	1	3	2

COURSE OBJECTIVES	
The students will be able to	
1	Write ALP for arithmetic and logical operations in 8086
2	Familiarize with MASM, Embedded C & Code composer studio
3	Write and execute programs in 8086 and MSP430.

COURSE OUTCOMES	
At the end of this course the student will be able to,	
CO1	Execution of different programs for 8086 in Assembly Level Language using MASM Assembler
CO2	Program MSP 430 for various applications.
CO3	Design and implement some specific real time applications.

LIST OF EXPERIMENTS:

Part A: 8086 Microprocessor Programs using NASM/8086 microprocessor kit.

1. Introduction to MASM Programming.
2. Programs using arithmetic and logical operations
3. Programs using string operations and Instruction prefix: Move Block, Reverse string, Sorting, Length of the string, String comparison.
4. Programs using CALL and RET instructions

Part B: Embedded C Experiments using MSP430 Microcontroller

1. Interfacing and programming GPIO ports in C using MSP430 (blinking LEDs , push buttons)
2. Usage of Low Power Modes: (Use MSPEXP430FR5969 as hardware platform and demonstrate the low power modes and measure the active mode and standby mode current)
3. Interrupt programming examples through GPIOs
4. PWM generation using Timer on MSP430 GPIO
5. Interfacing potentiometer with MSP430
6. PWM based Speed Control of Motor controlled by potentiometer connected to MSP430 GPIO
7. Using ULP advisor in Code Composer Studio on MSP430
8. Low Power modes and Energy trace++:
   a. Enable Energy Trace and Energy Trace ++ modes in CCS
   b. Compute Total Energy, and Estimated lifetime of an AA battery.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
III B.TECH – II SEMESTER
(LAB)

Subject Code	Title of the Subject	L	T	P	C
17A60505	**Object Oriented Analysis and Design& Data Analytics Lab**		1	3	2

COURSE OBJECTIVES	
1	Practice the notation for representing various UML diagrams
2	Analyze and design the problem by representing using UML diagrams
3	Become familiar with all phases of OOAD
4	Design, develop and test software systems for engineering applications.
5	Analyze technical solutions to computational problems and develop efficient algorithms

COURSE OUTCOMES	
CO1	Find solutions to the problems using object oriented approach
CO2	Gain Core Knowledge of R and Programming Concepts
CO3	Understand mathematics from a numerical point of view, including the application of these concepts root-finding, numerical integration and optimization
CO4	Understand the purpose for random variable and expectations required to understand simulations
CO5	Implement the Monte carlo and Stochastic Modelling
CO6	Work effectively in teams on data science projects using R

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓		✓		✓	✓			
CO2	✓		✓							✓		✓
CO3	✓		✓							✓		✓
CO4		✓			✓			✓			✓	

OOAD Problems that may be considered are

1. College information system
2. Hostel management
3. ATM system
4. Library management system
5. Passport Automation System
6. Political Administration System.

Data Analytics

1. R Environment Setup & R as calculating environment
2. R Basic programming, Input and output
3. Programming with functions & Sophisticated Data structures
4. Better Graphics using Graphics parameters
5. Frames and environments & Object –oriented Programming
6. Numerical Accuracy and program efficiency
7. Probability & Statistics: The law of Total probability
8. Simulation: Monte Carlo Integration – Hit and miss method
9. Data Modeling: Linear and Multiple Regression Models

Case Study

Consider the data set of Ozone levels in United States for the year 2014 and do the following analysis

- ✓ Formulate your questions

- ✓ Read in your data
- ✓ Check the packaging
- ✓ Look at the top and the bottom of your data
- ✓ Check your “n” s
- ✓ Validate with at least one external data source
- ✓ Make a plot
- ✓ Follow up

Text Books:

1.Introduction to Scientific Programming and Simulation Using R, Owen Jones, Robert Maillardet and Andrew Robinson, Second Edition, CRC Press, 2014

2. The Art of Data Science: A Guide for Anyone Who Works with Data, Roger D. Peng, Elizabeth Matsui, LeanPub, 2015.

3. Data Science for Business: What You Need to Know about Data Mining and Data-analytic Thinking, Foster Provost and Tom Fawcett. 2013

4. Elements of Statistical Learning, Trevor Hastie, Robert Tibshirani and Jerome Friedman, Springer, 2009.

Reference Books:

1. .Mining of Massive Datasets,JureLeskovek, AnandRajaraman and Jeffrey Ullman. , Cambridge University Press. 2014.

2.Machine Learning: A Probabilistic Perspective.Kevin P. Murphy, MIT Press, 2013.

3. Avrim Blum, John Hopcroft and Ravindran Kannan. Foundations of Data Science.

4.Data Mining and Analysis: Fundamental Concepts and Algorithms, Mohammed J. Zaki and Wagner Miera Jr., Cambridge University Press. 2014.

5. R Programming for Data Science, Roger D. Peng, LeanPub, 2015.

6.Python for Data Science for Dummies, Luca Massaron and John Paul Mueller, John Wiley and Sons, 2015.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A70501	**SOFTWARE TESTING**	3	-	-	3

COURSE OBJECTIVES	
1	Fundamentals for various testing methodologies.
2	Describe the principles and procedures for designing test cases.
3	Provide supports to debugging methods.
4	Acts as the reference for software testing techniques and strategies.

COURSE OUTCOMES	
CO1	Understand the basic testing procedures.
CO2	Able to support in generating test cases and test suites.
CO3	Able to test the applications manually by applying different testing methods and automation tools.
CO4	Apply tools to resolve the problems in Real time environment.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√					√		√		√	
CO2	√			√	√	√	√		√		√	
CO3		√	√	√	√	√				√		√
CO4		√		√						√		√

UNIT I

Introduction: Purpose of Testing, Dichotomies, Model for Testing, Consequences of Bugs, Taxonomy of Bugs.

Flow graphs and Path testing: Basics Concepts of Path Testing, Predicates, Path Predicates and Achievable Paths, Path Sensitizing, Path Instrumentation, Application of Path Testing.

UNIT II

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.

Text Books:

1. Software testing techniques – Boris Beizer, Dreamtech, second edition.

Reference Books :

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

2. Software Testing- Yogesh Singh, Camebridge

3. Software Testing, 3rd edition, P.C. Jorgensen, Aurbach Publications (Dist.by SPD).

4. Software Testing, N.Chauhan, Oxford University Press.

5. Introduction to Software Testing, P.Ammann & J.Offutt, Cambridge Univ. Press.

6. Effective methods of Software Testing, Perry, John Wiley, 2nd Edition, 1999.

7. Software Testing Concepts and Tools, P.Nageswara Rao, dreamtech Press

8. Win Runner in simple steps by Hakeem Shittu,2007 Genixpress.

9. Foundations of Software Testing, D.Graham & Others, Cengage Learning

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A70502	Mobile Application Development	2	2	-	3

COURSE OBJECTIVES	
1	Introducing the J2ME and how to write the code for small computing device.
2	Design & program real working education based mobile application projects.
3	To introduce the Android technology and its application.
4	Become familiar with common mobile application technologies and platforms.
5	Students will learn about record management system, JDBC and User Interface Designing.

COURSE OUTCOMES	
CO1	Describe the limitations and challenges of working in a mobile and wireless environment and research opportunities presented by these technologies.
CO2	Describe application models / architectures and best practices/patterns used to develop mobile software applications.
CO3	Explain Command, Item, Event processing classes and High level display classes, low level display classes and Record Management System.
CO4	Design Android User Interface for mobile applications.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓		✓		✓		✓		✓	✓		
CO2	✓	✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4	✓		✓		✓		✓		✓	✓		

UNIT-I

J2ME Overview: Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices.Small computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants.

J2ME Architecture and Development Environment: J2ME Architecture, Small Computing DeviceRequirements, Run – Time Environment, MIDlet programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME wireless Toolkit.

UNIT-II

J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices. **Commands, Items, and Event Processing:** J2ME User Interfaces, Display Class, The Palm OS Emulator, CommandClass, Item Class, Exception Handling.

High – Level Display: Screens, Screen Class, Alert Class, Form Class, Item Class, List Class, Text BoxClass, Ticker Class.

UNIT-III

Low Level Display: The Canvas, User Interactions, Graphics, Clipping Regions, Animation.
Record Management System: Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records,Searching Records, Record Listener.

UNIT-IV

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages. Overview of the JDBC process,Database Connection, Statement Objects, Result Set, Transaction Processing, Metadata, Data Types, Exceptions.

JDBC and Embedded SQL: Model programs, Tables, Indexing, Inserting Data into Tables, Selecting Datafrom a Table, Updating Tables, Deleting Data from a table. Joining Tables, Calculating Data, Grouping and Ordering Data

UNIT-V

Getting started with Android Programming: What is Android, Obtaining the required tools, Creating your First Android Application. Anatomy of an Android Application.
Activities, Fragments and Intents: Understanding Activities, Linking Activities Using Intents,Fragments, Calling Built – in Applications using Intents, Displaying Notifications
Android User Interface: Understanding the Components of a Screen, Adapting to Display Orientation,Managing Changes to Screen Orientation, Utilizing the Action Bar, Listening for UI Notifications.

TEXT BOOKS:

1. J2ME: The Complete Reference, James Keogh, TMH.
2. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India

REFERENCES:

1. Enterprise J2ME: Developing Mobile Java Applications, Michael Juntao Yuan, Pearson Education, 2004.
2. Android Application Development for Java programming by James C. Sheusi, Cengage.
3. Learning Android A Programmers Guide by Jerome DiMargio, TMH.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A70503	**Design pattern**	2	2	-	3

COURSE OBJECTIVES	
1	Identifying the appropriate patterns for design problems.
2	To understand design patterns and their underlying object oriented concepts.
3	To understand implementation of design patterns and providing solutions to real world software design problems.
4	To understand patterns with each other and understanding the consequences of combining patterns on the overall quality of a system.

COURSE OUTCOMES	
CO1	Know the underlying object oriented principles of design patterns.
CO2	Understand the context in which the pattern can be applied.
CO3	Understand how the application of a pattern affects the system quality and its tradeoffs.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓

UNIT-I

Introduction: What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT-II

A Case Study: Designing a Document Editor : Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary .

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

UNIT-III

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

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

UNIT-IV

Behavioral Patterns Part-I : Chain of Responsibility, Command, Interpreter, Iterator.
Behavioral Patterns Part-II : Mediator, Memento, Observer.

UNIT-V

Behavioral Patterns Part-II (cont'd): State, Strategy, Template Method, Visitor, and Discussion of Behavioral Patterns.
What to Expect from Design Patterns, a Brief History, the Pattern Community An Invitation, A Parting Thought.

TEXT BOOK:

1. Design Patterns By Erich Gamma, Pearson Education

REFERENCE BOOKS:

1. Pattern's in JAVA Vol-I By Mark Grand, Wiley DreamTech.
2. Pattern's in JAVA Vol-II By Mark Grand, Wiley DreamTech.
3. JAVA Enterprise Design Patterns Vol-III By Mark Grand, Wiley DreamTech.
4. Head First Design Patterns By Eric Freeman-Oreilly-spd
5. Design Patterns Explained By Alan Shalloway,Pearson Education.
6. Pattern Oriented Software Architecture, F.Buschmann &others, John Wiley & Sons.

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****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A70504	**Cloud Computing**	3	-	-	3

COURSE OBJECTIVES	
1	To explain the evolving computer model called cloud computing.
2	To introduce the various levels of services that can be achieved by cloud.
3	To describe the security aspects in cloud.

COURSE OUTCOMES	
CO1	Ability to create cloud computing environment
CO2	Ability to design applications for Cloud environment

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	

Unit-1

Introduction to cloud computing: Introduction, Characteristics of cloud computing, Cloud Models, Cloud Services Examples, Cloud Based services and applications

Cloud concepts and Technologies: Virtualization, Load balancing, Scalability and Elasticity, Deployment, Replication, Monitoring, Software defined, Network function virtualization, Map Reduce, Identity and Access Management, services level Agreements, Billing.

Cloud Services and Platforms : Compute Services, Storage Services, Database Services, Application services, Content delivery services, Analytics Services, Deployment and Management Services, Identity & and Access Management services, Open Source Private Cloud software.

Unit-2

Hadoop&MapReduce: Apache Hadoop, HadoopMapReduce Job Execution, Hadoop Schedulers, Hadoop Cluster setup.

Cloud Application Design: Reference Architecture for Cloud Applications, Cloud Application Design Methodologies, Data Storage Approaches.

Python Basics : Introduction, Installing Python, Python data Types & Data Structures, Control flow, Function, Modules, Packages, File handling, Date/Time Operations, Classes.

Unit-3

Python for Cloud: Python for Amazon web services, Python for Google Cloud Platform, Python for windows Azure, Python for MapReduce, Python packages of Interest, Python web Application Frame work, Designing a RESTful web API.

Cloud Application Development in Python: Design Approaches, Image Processing APP,Document Storage App, MapReduce App, Social Media Analytics App.

Unit-4

Big Data Analytics: Introduction, Clustering Big Data, Classification of Big data, Recommendation of Systems.

Multimedia Cloud: Introduction, Case Study: Live video Streaming App, Streaming Protocols, case Study: Video Transcoding App.

Cloud Application Benchmarking and Tuning: Introduction, Workload Characteristics, Application Performance Metrics, Design Considerations for a Benchmarking Methodology, Benchmarking Tools, Deployment Prototyping, Load Testing & Bottleneck Detection case Study, Hadoop benchmarking case Study.

Unit-5

Cloud Security: Introduction, CSA Cloud Security Architecture, Authentication, Authorization, Identity & Access Management, Data Security, Key Management, Auditing.

Cloud for Industry, Healthcare & Education: Cloud Computing for Healthcare, Cloud computing for Energy Systems, Cloud Computing for Transportation Systems, Cloud Computing for Manufacturing Industry, Cloud computing for Education.

Migrating into a Cloud: Introduction, Broad Approaches to migrating into the cloud, the seven –step model of migration into a cloud.

Organizational readiness and Change Management in The Cloud Age : Introduction, Basic concepts of Organizational Readiness, Drivers for changes : A frame work to comprehend the competitive environment , common change management models, change management maturity models, Organizational readiness self – assessment.

Legal Issues in Cloud Computing : Introduction, Data Privacy and security Issues, cloud contracting models, Jurisdictional issues raised by virtualization and data location, commercial and business considerations , Special Topics

Text Books:

1. “Cloud computing A hands-on Approach” By ArshdeepBahga, Vijay Madisetti, Universities Press, 2016

2.”Cloud Computing Principles and Paradigms: By Raj kumarBuyya, James Broberg, AndrzejGoscinski, wiley, 2016

References:

1. Mastering Cloud Computing by Rajkumar Buyya, Christian Vecchiola,S Thamarai Selvi, TMH
2. Cloud computing A hands-On Approach by Arshdeep Bahga and Vijay Madisetti.
3. Cloud Computing : A Practical Approach, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, TataMcGraw Hill, rp2011.
4. Enterprise Cloud Computing, GautamShroff, Cambridge University Press, 2010.
5. Cloud Application Architectures: Building Applications and Infrastructure in the Cloud, George Reese, O’Reilly, SPD, rp2011.
6. Essentials of Cloud Computing by K. Chandrasekaran. CRC Press

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A70505a.	**SOFTWARE PROJECT MANAGEMENT**	3	-	-	3

COURSE OBJECTIVES	
1	Understanding the specific roles within a software organization as related to project and process management
2	Describe the 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).
3	Understanding the basic infrastructure competences (e.g., process modeling and measurement)
4	Understanding the basic steps of project planning, project management, quality assurance, and process management and their relationships

COURSE OUTCOMES	
CO1	Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
CO2	Compare and differentiate organization structures and project structures
CO3	Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√		√		√		√		√	√
CO2	√			√	√		√		√		√	
CO3		√		√		√				√		√

UNIT I

Conventional Software Management: The waterfall model, conventional software Management performance. Evolution of Software Economics: Software Economics, pragmatic software cost estimation

UNIT II

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

The old way and the new: The principles of conventional software engineering, principles of modern software management, transitioning to an iterative process

UNIT III

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts. Model based software architectures: A Management perspective and technical perspective.

UNIT IV

Work Flows of the process: Software process workflows, Inter Trans workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction planning process, Pragmatic planning.

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building Blocks, The Project Environment

UNIT V

Project Control and Process instrumentation: The server care Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Tailoring the Process: Process discriminates, Example.

Future Software Project Management: Modern Project Profiles Next generation Software economics, modern Process transitions.

Case Study: The Command Center Processing and Display System-Replacement (CCPDS-R)

Text Books:

1. Software Project Management, Walker Royce, Pearson Education.

2. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition,Tata Mc-Graw Hill

Reference Books :

1. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O"Reilly, 2006

2. Head First PMP, Jennifer Greene & Andrew Stellman, O"Reilly,2007

3. Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, second edition,Wiley India, 2004.
4. Agile Project Management, Jim Highsmith, Pearson education, 2004
5. The art of Project management, Scott Berkun, O‟Reilly, 2005.
6. Software Project Management in Practice, Pankaj Jalote, Pearson Education,2002

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****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A70505b.	**DISASTER MANAGEMENT**	3	-	-	3

COURSE OBJECTIVES	
1	To provide an exposure to disasters, types and their significance.
2	To understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
3	To gain a preliminary understanding of Disaster Risk Reduction approaches
4	To develop rudimentary ability to respond to their surroundings with potential disaster response in living areas, with due sensitivity
5	To enhance awareness of institutional processes in the country

COURSE OUTCOMES	
CO1	Differentiate the types of disasters, causes and their impact on environment and society
CO	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
CO3	Draw the hazard and vulnerability profile of India, selected models of disaster management
CO4	Disaster damage assessment and management, Scenarios in the Indian context

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

UNIT - I:

INTRODUCTION TO DISASTERS

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc - Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don'ts during various types of Disasters.

UNIT II

APPROACHES TO DISASTER RISK REDUCTION (DRR)

Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders-Institutional Processess and Framework at State and Central Level- State Disaster Management Authority(SDMA) – Early Warning System – Advisories from Appropriate Agencies.

UNIT III

INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT

Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV

DISASTER RISK MANAGEMENT IN INDIA

Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health,Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

UNIT V

DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS

Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

TEXTBOOKS:

1. Singhal J.P. “Disaster Management”, Laxmi Publications, 2010. ISBN-10: 9380386427 ISBN-13: 978-9380386423
2. Tushar Bhattacharya, “Disaster Science and Management”, McGraw Hill India Education Pvt. Ltd., 2012. ISBN-10: 1259007367, ISBN-13: 978-1259007361]
3. Gupta Anil K, Sreeja S. Nair. Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi, 2011
4. Kapur Anu Vulnerable India: A Geographical Study of Disasters, IIAS and Sage Publishers, New Delhi, 2010.

REFERENCES

1. Govt. of India: Disaster Management Act , Government of India, New Delhi, 2005
2. Government of India, National Disaster Management Policy,2009.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A70505c.	**DIGITAL MARKETING**	3	-	-	3

COURSE OBJECTIVES	
1	To provide foundation in the key concepts on digital marketing.
2	Understand how and why to use digital marketing for multiple goals within a larger marketing and/or media strategy.
3	Learn to develop, evaluate, and execute a comprehensive digital marketing strategy and plan.
4	Understand the major digital marketing channels - online advertising: Digital display, video, mobile, search engine, and social media
5	Learn how to measure digital marketing efforts and calculate ROI

COURSE OUTCOMES	
CO1	Create original content for digital distribution in a manner that employs marketing research to achieve organizational goals.
CO2	Develop an appropriate online distribution strategy to achieve the digital marketing objectives.
CO3	Analyze, implement and evaluate outward facing communication systems and their usage.
CO4	Develop web applications utilizing industry standard markup, protocols, and languages.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												

UNIT-I

Principles and Drivers of New Marketing Environment - Digital Media Industry - reaching Audience Through Digital Channels- Traditional and Digital Marketing - Introduction to Online Marketing Environment - Dotcom Evolution - Internet Relationships - Business in Modern Economy - Integrating E-Business to an Existing Business Model – Online Marketing Mix - Mobile Marketing - Digital Signage.

UNIT-II

Purchase Behavior of Consumers in Digital Marketing Format – Online Customer Expectations - Online B2C Buying Process - Online B2B Buying Behavior -Website Designing - Website Content - Forms of Search Engines – Working of Search Engines - Revenue Models in Search Engine Positioning – SEO - Display advertising - Trends.

UNIT-III

Product Attributes and Web Marketing Implications - Augmented Product Concept - Customizing the Offering - Dimensions of Branding Online -Internet Pricing Influences - Price and Customer Value - Online Pricing Strategies and Tactics – Time-based Online Pricing - Personalized Pricing- Bundle Pricing.

UNIT-IV

Internet Enabled Retailing - Turning Experience Goods into Search Goods-Personalization through Mass Customization - Choice Assistance -Personalized Messaging - Selling through Online Intermediaries – Director Customer Interaction - Online Channel Design for B2C and B2BMarketing.

UNIT-V

Integrating Online Communication into IMC Process - Online Advertising– Email Marketing - Viral marketing - Affiliate Marketing – Participatory Communication Networks - Social Media Communities – Consumer Engagement - Co-Created Content Management-Interactive Digital Networks - Customer – Led Marketing Campaigns- Legal and Ethical aspects related to Digital Marketing

TEXT BOOKS:

1.Smith P R Chaffey Dave, E-Marketing Excellence: The Heart of E-Business, Butterworth Heinemann, USA

2. Strauss Judy, E-Marketing, Prentice Hall, India

REFERENCES:

1. Fleming Hansen Emotions, Advertising and Consumer Choice .Copenhagen Business School Press.

2. Curtis P. Haugtvedt, Karen A. Machleit and Richard Yalch Online Consumer Psychology: Understanding and Influencing Consumer Behavior in the Virtual Worldby

3. Marieke K. de Mooij Global Marketing and Advertising: Understanding Cultural Paradoxes, Sage publications

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A70506a.	**Digital Forensics & Cyber Laws**	3	-	-	3

COURSE OBJECTIVES	
1	Study digital forensics and Cyber laws
2	How to prepare for digital evidence investigations
3	Study the importance of maintaining professional conduct.
4	Study requirements for data recovery workstations and software.

	COURSE OUTCOMES
1	Ability to learn the concepts of computer forensics.
2	Select and apply current computer forensics tools.
3	Identify and apply current practices for processing crime and incident scenes.
4	Apply digital evidence controls.
5	Conduct basic cyber forensic analysis.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2			✓		✓		✓		✓	✓		
CO3		✓		✓							✓	
CO4	✓		✓			✓			✓			✓
CO5	✓		✓			✓			✓			✓

Unit-1:

Digital forensics: Introduction – Evidential potential of digital devices: closed vs. open systems, evaluating digital evidence potential- Device handling: seizure issues, device identification, networked devices and contamination

Unit-2:

Digital forensics examination principles: Previewing, imaging, continuity, hashing and evidence locations- Seven element security model- developmental model of digital systems- audit and logs- Evidence interpretation: Data content and context

Unit 3:

Network Forensics: Collecting Network Based Evidence - Investigating Routers - Network Protocols - Email Tracing - Internet Fraud-Systems Investigation and Ethical Issues: Data Analysis Techniques - Investigating Live Systems (Windows &UNIX) - Investigating Hacker Tools - Ethical Issues – Cybercrime

Unit-4:

Mobile phone forensics: crime and mobile phones, evidences, forensic procedures, files present in SIM card, device data, external memory dump, evidences in memory card, operators systems Android forensics: Procedures for handling an android device, imaging android USB mass storage devices, logical and physical techniques

Unit -5:

Cybercrimes and Cyber Security: the Legal Perspectives Introduction Cyber Crime and Legal Landscape around the world, Why Do We Need Cyber laws: The Indian Context, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario In India, Digital signatures and the Indian IT Act, Amendments to the Indian IT Act, Cybercrime and Punishment Cyber law, Technology and Students: Indian Scenario.

Text Books

1. Peter Stephenson, "Investigating Computer Crime: A Handbook for Corporate Investigations", Sept 1999
2. Eoghan Casey, "Handbook Computer Crime Investigation's Forensic Tools and Technology", Academic Press, 1st Edition, 2001
3. Iosif I. Androulidakis, " Mobile phone security and forensics: A practical approach", Springer publications, 2012
4. Andrew Hoog, " Android Forensics: Investigation, Analysis and Mobile Security for Google Android", Elsevier publications, 2011
5. Angus M.Marshall, " Digital forensics: Digital evidence in criminal investigation", John – Wiley and Sons, 2008
6. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA .

REFERENCES

1. Skoudis. E., Perlman. R. Counter Hack: *A Step-by-Step Guide to Computer Attacks and Effective Defenses.*Prentice Hall Professional Technical Reference. 2001.
2. Bill Nelson,Amelia Philips and Christopher Steuart, “Guide to computer forensics and investigations”,course technology,4thedition,ISBN: 1-435-49883-6
3. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A70506b.	**Service Oriented Architecture**	3	-	-	3

COURSE OBJECTIVES	
1	Understand SOA and evolution of SOA.
2	Understand web services, primitive and contemporary SOA.
3	Understand principles of service orientation and various service layers.
4	Understand business process design and service-oriented business process design.
5	Understand basic concepts of SOA platforms, integration considerations

COURSE OUTCOMES	
CO1	Knowledge on various principles of service orientation also understand the technology underlying the service design.
CO2	Knowledge on basic concepts of SOA and it differs with other architectures.
CO3	Knowledge on advanced concepts of service composition, Orchestration and Choreography.
CO4	Understanding of web service framework with respect to SOA.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												

UNIT-I

Introduction to SOA

Fundamental SOA; Common Characteristics of contemporary SOA; Common tangible benefits of SOA; An SOA timeline (from XML to Web services to SOA); The continuing evolution of SOA (Standards organizations and Contributing vendors)

UNIT-II

Web Services and Primitive SOA

The Web services framework; Services (as Web services); Service descriptions (with WSDL); Messaging (with SOAP).

Web Services and Contemporary SOA

Message exchange patterns; Service activity; Coordination; Atomic Transactions; Business activities; Orchestration; Choreography.

UNIT-III

Principles of Service Orientation

Services-orientation and the enterprise; Anatomy of a service-oriented architecture; Common Principles of Service-orientation; How service orientation principles inter-relate; Service-orientation and object-orientation; Native Web service support for service-orientation principles.

UNIT-IV

Service Layers - Abstraction, Business and Orchestration Service Layers.

Business Process Design: WS-BPEL language basics; WS-Coordination overview; Service-oriented business process design; WS-addressing language basics; WS-Reliable Messaging language basics.

UNIT-V

SOA Platforms
SOA platform basics; SOA support in J2EE; SOA support in .NET; Integration considerations. Amazon web services as an example.

TEXT BOOKS:

1. Thomas Erl, "Service-Oriented Architecture – Concepts, Technology, and Design", Pearson

Education, 2005.

2. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Pearson Education,

2005.

REFERENCES:

1) The Definitive guide to SOA, Jeff Davies & others, Apress, Dreamtech.
2) Java SOA Cook book, E.Hewitt, SPD.
3) SOA in Practice, N.M.Josuttis, SPD.
4) Applied SOA, M.Rosen and others, Wiley India pvt. Ltd.
5) Java Web Services Architecture, J.Mc Govern, and others, Morgan Kaufmann Publishers, Elsevier.
6)SOA for Enterprise Applications, Shankar.K, Wiley India Edition.
7) SOA-Based Enterprise Integration, W.Roshen, TMH.
8) SOA Security, K.Rama Rao, C.Prasad, dreamtech press.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A70506c.	**ETHICAL HACKING**	3	-	-	3

COURSE OBJECTIVES	
1	The aim of the course is to introduce the methodologies and framework of ethical hacking for enhancing the security
2	The course includes-Impacts of Hacking; Types of Hackers; Information Security Models; Information Security Program; Business Perspective; Planning a Controlled Attack; Framework of Steps (Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Deliverable and Integration)

COURSE OUTCOMES	
CO1	Gain the knowledge of the use and availability of tools to support an ethical hack
CO2	Gain the knowledge of interpreting the results of a controlled attack
CO3	Understand the role of politics, inherent and imposed limitations and metrics for planning of a test
CO4	Comprehend the dangers associated with penetration testing

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4	✓		✓			✓			✓			✓

UNIT I

Introduction: Hacking Impacts, The Hacker Framework: Planning the test, Sound Operations, Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Final Analysis, Deliverable, Integration Information Security Models: Computer Security, Network Security, Service Security, Application Security, Security Architecture Information Security Program: The Process of Information Security, Component Parts of Information Security Program, Risk Analysis and Ethical Hacking

UNIT II

The Business Perspective: Business Objectives, Security Policy, Previous Test Results, Business Challenges Planning for a Controlled Attack: Inherent Limitations, Imposed Limitations, Timing is Everything, Attack Type, Source Point, Required Knowledge, Multi-Phased Attacks, Teaming

and Attack Structure, Engagement Planner, The Right Security Consultant, The Tester, Logistics, Intermediates, Law Enforcement

UNIT III

Preparing for a Hack: Technical Preparation, Managing the Engagement Reconnaissance: Social Engineering, Physical Security, Internet Reconnaissance

UNIT IV

Enumeration: Enumeration Techniques, Soft Objective, Looking Around or Attack, Elements of Enumeration, Preparing for the Next Phase Exploitation: Intutive Testing, Evasion, Threads and Groups, Operating Systems, Password Crackers, RootKits, applications, Wardialing, Network, Services and Areas of Concern

UNIT V

Deliverable: The Deliverable, The Document, Overal Structure, Aligning Findings, Presentation Integration: Integrating the Results, Integration Summary, Mitigation, Defense Planning, Incident Management, Security Policy, Conclusion

TEXT BOOK

1. James S. Tiller, "The Ethical Hack: A Framework for Business Value Penetration Testing", Auerbach Publications, CRC Press

REFERENCE BOOKS

1. EC-Council, "Ethical Hacking and Countermeasures Attack Phases", Cengage Learning
2. Michael Simpson, Kent Backman, James Corley, "Hands-On Ethical Hacking and Network Defense", Cengage Learning

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A70507	**SOFTWARE TESTING Lab**	-	1	3	2

COURSE OBJECTIVES	
1	Fundamentals for various testing methodologies.
2	Describe the principles and procedures for designing test cases.
3	Provide supports to debugging methods.
4	Acts as the reference for software testing techniques and strategies.

COURSE OUTCOMES	
CO1	Describe the basic testing procedures.
CO2	Able to support in generating test cases and test suites.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√					√		√		√	
CO2	√			√	√	√	√		√		√	

Sample problems on testing:

1. Write programs in 'C' Language to demonstrate the working of the following constructs: i) do...while ii) while….do iii) if…else iv) switch v) for
2. "A program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Win runner)
7. Study of any web testing tool (e.g. Selenium)
8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)
11. Take a mini project (e.g. University admission, Placement Portal) and execute it. During the Life cycle of the mini project create the various testing documents* and final test report document.

Additional problems on testing:

1.Test the following using JUnit and CPPUnit:
i)Sorting problems ii)Searching problems iii)Finding gcd of two integers iv)Finding factorial of a number.
2.Test web based forms using HTMLUnit.
3.Test database stored procedures using SQLUnit.
(Use sufficient number of test cases in solving above Problems)
*Note: To create the various testing related documents refer to the text "Effective Software Testing Methodologies by William E. Perry"

REFERENCE BOOKS:

1. Software Testing Concepts and Tools,P.Nageswara Rao,dreamtech press.
2. Software Testing Tools,Dr.K.V.K.K.Prasad,dreamtech Press.
3. Software Testing with Visual Studio Team System 2008, S.Subashini, N.Satheesh kumar,SPD.

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****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – I SEMESTER
(LAB)

Subject Code	Title of the Lab	L	T	P	C
17A70508	Mobile Application Development Lab		1	3	2

COURSE OBJECTIVES	
1	In this lab, a student is expected to design, implement, document and present a mobile client/server system using standard Java and Java 2 Micro Edition (J2ME) platform.
2	Specifically it is required to design and implement a system that consists mainly of a mobile client (MC) and a Proxy Server (PS).
3	MC will be written in J2ME, MIDP 2.0, while PS will be written in standard Java. It is necessary to use a mobile phone emulator to develop and demonstrate the experiments.
4	It may be necessary to use other components or existing resources (servers) as needed. For instance a database local to PS or a web service available on the Internet that can be invoked by the PS.

COURSE OUTCOMES	
CO1	Demonstrate J2ME 2.5.2 Wireless Toolkit/Android studio and Layout Managers.
CO2	Design Graphical primitives in J2ME 2.5.2 Wireless Toolkit/Android studio.
CO3	Implement Multi-threading and GPS location information.
CO4	Deploy applications to hand-held devices.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		

List of Experiments:

Week - 1: Installation of Java Wireless Toolkit (J2ME)

1) If the Java Development Kit (JDK) is not there or only having the Java Runtime Environment (JRE) installed, install the latest JDK from http://java.sun.com/javase/downloads/index.jsp. Current stable release of Java is JDK 6 Update 7 but check the web page in case there are newer non-beta releases available.
2) Next, download the Java Wireless Toolkit (formerly called J2ME Wireless Toolkit) from: http://java.sun.com/products/sjwtoolkit/download.html.
3) Run the installer (for example, for Windows it is: sun_java_wireless_toolkit- 2_5_2-windows.exe). The installer checks whether a compatible Java environment has been pre-installed. If not, it is necessary to uninstall old versions of Java and perform Step 1 again.
Once after successful installation of Java and the tool kit compile this program and run the following program in the toolkit.
Steps to run this program in toolkit:

1. Start -> All Programs -> Sun Java Tool Kit -> Wireless Tool Kit
2. Click New Project – Enter Project Name -> Enter Class Name -> Click on Create Project.
3. Choose appropriate API Selection and Configurations.
4. Place Java Source file in WTK2.1 / WTK2.2\apps\projectname\src
5. Build the Project.
6. Run the Project.

```
import javax.microedition.lcdui.*;
import javax.microedition.midlet.*;

public class HelloWorld extends MIDlet{
private Form form;
private Display display;

public HelloWorld(){
super();
  }

public void startApp(){
form = new Form("Hello World");
   String msg = "Hello World!!!!!!!";
form.append(msg);
display = Display.getDisplay(this);
display.setCurrent(form);
  }

public void pauseApp(){}

public void destroyApp(boolean unconditional){
```

```
notifyDestroyed();
  }
}
```

Week - 2 Working with J2ME Features:

Working with J2ME Features: Say, creating a Hello World program Experiment with the most basic features and mobile application interaction concepts (lists, text boxes, buttons, radio boxes, soft buttons, graphics, etc)

2.1 Create a program which creates to following kind of menu.

* cut
* copy
* past
* delete
* select all
* unselect all

2.2 Event Handling.

Create a menu which has the following options:

* cut - can be on/off
* copy - can be on/off
* paste - can be on/off
* delete - can be on/off
* select all - put all 4 options on
* unselect all - put all 4 options off

2.3. Input checking

Create an MIDP application which examine, that a phone number, which a user has entered is in the given format.

* Area code should be one of the following: 040, 041, 050, 0400, 044
* There should 6-8 numbers in telephone number (+ area code)

Week - 3 Threads & High Level UI:

3.1. Create a slide show which has three slides, which includes only text. Program should change to the new slide after 5 seconds. After the third slide program returns to the first slide.

3.2 High-level UI

Create a MIDP application, which show to the user 5-10 quiz questions. All questions have 4 possible options and one right option exactly. Application counts and shows to the user how many right answers were right and shows them to user.

3.3 Create a MIDP application, where the user can enter player name and points. The program saves the information to the record using RMS at MIDP device. Program should also print out the top 10 player list to the end user. You can use this class in your game if you made own class for saving and reading record sets.

Week - 4 Working on Drawing and Images

4.1 Create a slide show which has three slides, which includes pictures at PNG format. Program should change to the new slide other 5 seconds.

4.2 Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array.

4.3 Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array. You can enter four data (integer) values to the input text field.

Week - 5 Developing Networked Applications using the Wireless Toolkit

Creating a Simple Client-Server Application
Create, compile and run a basic UDP-based client-server application.
Creating the Datagram Server project
1) Click on Wireless Toolkit 2.5.2 under the group: All Programs→Sun Java
(TM) Wireless Toolkit 2.5.2.
2) Click on 'New Project...' button.
3) Enter project name as 'DatagramServer'. Enter MIDlet name as 'DatagramServer'. Note that the Midlet name is the same as the name of the class in the source code, which extends the MIDlet class, otherwise the application won't run.
4) Another window pops up where it is required to select a target platform. Select 'MIDP 1.0' from the drop down list.
5) After clicking OK, the project is created; and the Wireless Toolkit tells that the name of the folder where source code files are created. The path of the source code folder is displayed in the debug output window.

Creating and Compiling the DatagramServer source files

The Wireless Toolkit does not come with an IDE by default so Use any IDE or a text editor like Notepad.
1) Create a new text file called DatagramServer.java in the source folder of the project. The exact path of this folder is displayed in the Wireless Toolkit window.
2) Paste contents DatagramServer.java from into the source file.

Running your Server application on the Phone simulator

1) After compiling the project successfully, click on the Run button in the Wireless Toolkit window.
2) A graphical window depicting a phone handset will appear with the name of your application highlighted on its screen as shown below.
3) To start the application, click on the right soft-key (marked with a dot) below the ‘Launch’ command.
4) The phone simulator might ask if it is OK to run the network application. Select ‘Yes’ by clicking on the appropriate soft-key. The server is now up and running.
5) Keep the server running during the creation, compilation and running of the Datagram Client application.

Creating the DatagramClient project

1) Use the same instance of the Wireless Toolkit that is used for creating and compiling the Datagram Server project.
2) Click on 'New Project...' button.
3) A new window pops up. Enter project name as 'DatagramClient'. Enter MIDlet name as 'DatagramClient'. Note that the Midlet name is the same as the name of the class in the source code, which extends the MIDlet class.
4) Another window pops up where one has to select a target platform. Select 'MIDP 1.0' from the drop down list.
5) After clicking OK, the project is created and the Wireless Toolkit tells where to place the source code files. The path of the source code folder is displayed in the debug output window as explained before.

Creating and Compiling the DatagramClient source files

1) Create a new text file called DatagramClient.java in the source folder of the project.
2) Paste contents DatagramClient.java into the source file.
3) Then click on the Build button in the Wireless Toolkit window. If the compilation is OK, it will say Build Complete in the window's debug output window, otherwise it will show the errors.
Note: In the source code, use the System.out.println() statement to output debug information to this window.

Running your Client application on the Phone simulator

1) After compiling the project successfully, click on the Run button in the Wireless Toolkit window.
2) A graphical window depicting a phone handset will appear with the name of the application highlighted on its screen.
3) To start the application, click on the right soft-key (marked with a dot) below the ‘Launch’ command.

4) The phone simulator might ask if it is OK to run the network application. Select 'Yes' by clicking on the appropriate soft-key. The client is now up and running.
5) When the client executes on the phone simulator, one should see a text box with the caption 'Message'. Enter any message and press the right soft-key (corresponding to Send). If the client-server application is working properly, the screen of the server phone will display the message sent by the client and the client screen will now display a message sent by the server in response. The response message from the server is the original client message in reverse.
6) Try various features of the phone simulator including the different look-and feel options.

Week - 6 Authentication with a Web Server

6.1 Write a sample program to show how to make a SOCKET Connection from j2me phone.
This J2ME sample program shows how to how to make a SOCKET Connection from a J2ME Phone. Many a times there is a need to connect backend HTTP server from the J2ME application. shows how to make a SOCKET connection from the phone to port 80.
6.2 Login to HTTP Server from a J2ME Program
This J2ME sample program shows how to display a simple LOGIN SCREEN on the J2ME phone and how to authenticate to a HTTP server.
Many J2ME applications for security reasons require the authentication of the user. This free J2ME sample program, shows how a J2ME application can do authentication to the backend server.
Note: Use Apache Tomcat Server as Web Server and Mysql as Database Server.
Week - 7 & 8 Web Application using J2ME

The following should be carried out with respect to the given set of application domains: (Assume that the Server is connected to the well-maintained database of the given domain. Mobile Client is to be connected to the Server and fetch the required data value/information)

- Students Marks Enquiry
- Town/City Movie Enquiry
- Railway/Road/Air (For example PNR) Enquiry/Status
- Sports (say, Cricket) Update
- Town/City Weather Update
- Public Exams (say Intermediate or SSC)/ Entrance (Say EAMCET) Results Enquiry

Divide Students into Batches and suggest them to design database according to their domains and render information according to their requests.

Text Books:

3. J2ME: The Complete Reference, James Keogh, TMH.
4. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India

References:

4. Enterprise J2ME: Developing Mobile Java Applications, Michael Juntao Yuan, Pearson Education, 2004.
5. Android Application Development for Java programming by James C. Sheusi, Cengage.
6. Learning Android A Programmers Guide by Jerome DiMargio, TMH.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A80501a.	**Information & cyber security**	3	-	-	3

COURSE OBJECTIVES	
1	Extensive, thorough and significant understanding of the concepts, issues, principles and theories of computer network security
2	Identifying the suitable points for applying security features for network traffic
3	Understanding the various cryptographic algorithms and implementation of the same at software level
4	Understanding the various attacks, security mechanisms and services

COURSE OUTCOMES	
CO1	Protect the network from both internal and external attacks
CO2	Design of new security approaches
CO3	Ability to choose the appropriate security algorithm based on the requirements.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓

UNIT I

Security Goals, Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs.

UNIT II

Conventional Encryption Principles & Algorithms (DES, AES, RC4), Block Cipher Modes of Operation, Location of Encryption Devices, Key Distribution,

Public key cryptography principles, public key cryptography algorithms (RSA, RABIN, ELGAMAL, Diffie-Hellman, ECC), Key Distribution.

UNIT III

Approaches of Message Authentication, Secure Hash Functions (SHA-512, WHIRLPOOL) and HMAC

Digital Signatures: Comparison, Process- Need for Keys, Signing the Digest, Services, Attacks on Digital Signatures, Kerberos, X.509 Directory Authentication Service.

UNIT IV

Email Security: Pretty Good Privacy (PGP) and S/MIME.

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT V

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.

Text book:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education, 2008.

2.Cryptography& Network Security by Behrouz A. Forouzan, TMH 2007**.**

3.Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA

4. Introduction to Cyber Security , Chwan-Hwa(john) Wu,J.David Irwin.CRC Press T&F Group

Reference book:

1. Information Systems Security,Godbole,Wiley Student Edition.
2. Cryptography and Network Security by William Stallings, Fourth Edition,Pearson Education 2007.
3. Fundamentals of Computer Security , Springer.
4. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
5. Computer Security Basics by Rick Lehtinen, Deborah Russell & G.T.Gangemi Sr., SPD O'REILLY 2006.
6. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.

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IV B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A8050b.	**Software Architecture**	3	-	-	3

COURSE OBJECTIVES	
1	To understand interrelationships, principles and guidelines governing architecture and evolution over time.
2	Introduction to the fundamentals of software architecture
3	To understand various architectural styles of software systems.
4	To understand design patterns and their underlying object oriented concepts.
5	Software architecture and quality requirements of a software system
6	Fundamental principles and guidelines for software architecture design, architectural styles, patterns, and frameworks.
7	Methods, techniques, and tools for describing software architecture and documenting design rationale.
8	Software architecture design and evaluation processes

COURSE OUTCOMES	
CO1	Design and motivate software architecture for large scale software systems
CO2	Recognize major software architectural styles, design patterns, and frameworks
CO3	Describe a software architecture using various documentation approaches and architectural description languages
CO4	Generate architectural alternatives for a problem and select among them
CO5	Use well-understood paradigms for designing new systems

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3		✓		✓							✓	
CO4	✓		✓			✓			✓			✓
CO5	✓		✓			✓			✓			✓

UNIT I: ENVISIONING ARCHITECTURE

What is software Architecture-What is Software Architecture, Other Points of View, Architectural Patterns, Reference Models, and Reference Architectures, Importance of Software Architecture, Architectural Structures and views.

ENVISIONING ARCHITECTURE:

Architecture Business Cycle- Architectures influences, Software Processes and the Architecture Business Cycle, Making of "Good" Architecture.

ARCHITECTURAL DESIGN: Software Architecture, Architectural Genres, Architectural Styles, Architectural Design.

COMPONENT-LEVEL DESIGN: What is a Component, Designing Class-Based Components Conducting Component-Level Design, Component-Level Design for WebApps.

UNIT II: DESIGNING THE ARCHITECTURE WITH STYLES

Designing the Architecture: Architecture in the Life Cycle, Designing the Architecture, Formatting the Team Structure, Creating a Skeletal System.

Architecture Styles: Architectural Styles, Pipes and Filters, Data Abstraction and Object-Oriented Organization, Event-Based, Implicit Invocation, Layered Systems, Repositories, Interpreters.

UNIT III: CREATING AN ARCHITECTURE-I

Creating an Architecture: Understanding Quality Attributes – Functionality and Architecture, Architecture and Quality Attributes, System Quality Attributes, Quality Attribute. Scenarios in Practice, Other System Quality Attributes, Business Qualities, Architecture Qualities.

Achieving Qualities: Introducing Tactics, Availability Tactics, Modifiability Tactics, Performance Tactics, Security Tactics, Testability Tactics, Usability Tactics.

UNIT IV: CREATING AN ARCHITECTURE-II

Documenting Software Architectures: Use of Architectural Documentation, Views, Choosing the RelevantViews, Documenting a view, Documentation across Views. Reconstructing Software Architecture: Introduction, Information Extraction, Database Construction, View Fusion, and Reconstruction.

UNIT V: ANALYZING ARCHITECTURES

The ATAM: Participants in the ATAM, Outputs of The ATAM, Phases Of the ATAM. The CBAM: Decision-Making Context, The Basis for the CBAM, Implementing the CBAM. The World Wide Web:A Case study in Interoperability- Relationship to the Architecture Business Cycle, Requirements and Qualities, Architecture Solution, Achieving Quality Goals.

TEXT BOOKS:

1. Software Architectures in Practice , Len Bass, Paul Clements, Rick Kazman, 2nd Edition, Pearson Publication.

2. Software Architecture , Mary Shaw and David Garlan, First Edition, PHI Publication, 1996.\

REFERENCES BOOKS:

1. **Software Design: From Programming to Architecture**, Eric Braude**,** Wiley, 2004.
2. N. Domains of Concern in Software Architectures and Architecture Description Languages. Medvidovic and D. S. Rosenblum. USENIX.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
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IV B.TECH – II SEMESTER
(THEORY)

Subject Code	Title of the Subject	L	T	P	C
17A80501c.	**SYSTEM APPLICATIONS PRODUCTS**	3	-	-	3

COURSE OBJECTIVES	
1	Understand the role of enterprise systems in supporting business processes.
2	Identify key integration points between financial accounting and other processes.
3	Analyze the organizational data.
4	Understand the role of the credit management process in fulfillment.
5	Analyze the key concepts associated with material planning.

COURSE OUTCOMES	
CO1	Adopt and apply an integrated perspective to business processes
CO2	Effectively use SAP ERP to execute key steps in the procurement process.
CO3	Ability to use SAP ERP to extract meaningful information about the production process.
CO4	Extract and evaluate meaningful information about the material planning process using the SAP ERP system.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												

Unit 1:

Introduction to Business Processes: The Functional Organizational Structure, Business Processes, Global Bike Incorporated (GBI). **Introduction to Enterprise Systems:** Enterprise Systems, Data in an Enterprise System, Reporting. **Introduction to Accounting:** Organizational Data, Master Data, Key Concepts, Processes, Reporting.

Unit 2:

The Procurement Process: Organizational Data, Master Data, Key Concepts, Process, Reporting.

Unit 3:

The Fulfillment Process: Organizational Data, Master Data, Process, Credit Management Process, Reporting.

Unit 4:

The Production Process: Master Data, Process, Reporting. **Inventory and Warehouse Management Processes:** Inventory Management, Organizational Data in warehouse Management, Master Data in Warehouse Management, Processes in Warehouse Management, Reporting.

Unit 5:

The Material Planning Process: Master Data, Process, Reporting, **Process Integration:** Procurement, Fulfillment, and IWM Processes, Procurement, Fulfillment, Production, and IWM Processes.

Text Book:

1. "Integrated Business Processes with ERP systems" Simha R.Magal, Jeffery word, JOHN WILEY & SON S, INC.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A80502a.	**Internet of Things**	3	-	-	3

COURSE OBJECTIVES	
1.	Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IoT Devices.

COURSE OUTCOMES	
CO1	Able to understand the application areas of IoT
CO2	Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
CO3	Able to understand building blocks of Internet of Things and characteristics.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓

UNIT I: Introduction to Internet of Things
Introduction, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies**.**

UNIT II: Domain Specific IoTs
Introduction, Home Automation, cities, Environment, Retail, Agriculture, Industry, Health & Lifestyle.

UNIT III:
IoT and M2M
Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT.

IoT System Management with NETCONF-YANG
Need for IoT Systems Management, Simple Network Management Protocol(SNMP), Network Operator requirements, NETCONF, YANG, IoT System Management with NETCONF-YANG.

UNIT IV: Developing Internet of Things
Introduction, IoT Design Methodology, Case Study on IoT System for Weather Monitoring.

UNIT V:
Case Studies Illustrating IoT Design:

Introduction, Home Automation, Cities, Environment, Agriculture, Productivity Applications.

Advanced Topics:

Introduction, Apache Hadoop, Using Hadoop Map Reduce for Batch Data Analysis.

TEXT BOOKS:

1. Internet of Things a Hands-on Approach by Arshdeep Bahga and Vijay Madisetti. University Press

REFFERENCE BOOOKS:

1. Internet of Things: Architecture, Design Principles and Applications by Raj Kamal MCGraw Hill Edition.
2. The Internet of Things key applications and protocols by Oliver Hersent,
David Boswarthickand Omar elloumi.Wiley Student Editon.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A80502b.	**IMAGE PROCESSING**	3	-	-	3

COURSE OBJECTIVES	
1	Describe and explain basic principles of digital image processing;
2	Design and implement algorithms that perform basic image processing (e.g., noise removal and image enhancement);
3	Design and implement algorithms for advanced image analysis (e.g., image compression, image segmentation);
4	Assess the performance of image processing algorithms and systems.

COURSE OUTCOMES	
CO1	Review the fundamental concepts of a digital image processing system.
CO2	Apply various frequency domain transforms on images.
CO3	Practice the techniques for image enhancement and image restoration.
CO4	Use various segmentation and boundary representation techniques.
CO5	Illustrate various compression techniques.
CO6	Able to understand image compression standards

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2		✓		✓							✓	
CO3	✓		✓			✓			✓			✓
CO4			✓		✓		✓		✓	✓		
CO5			✓		✓		✓		✓	✓		
CO6			✓		✓		✓		✓	✓		

UNIT-I

DIGITAL IMAGE FUNDAMENTALS

Elements of visual perception – Image sensing and acquisition – Image Formation Model, imageSampling and Quantization, Representation of Digital Images, Spatial and Gray levelResolution, Zooming and Shrinking of Digital Images, Basic relationship between pixels – Basic gray level transformations. Color images – Color models - Chromaticity diagram.

UNIT-II

IMAGE TRANSFORMS

1D and 2D image transforms - Separable Transforms - One dimensional Fourier Transform-DFT – Two dimensional Fourier Transform - Discrete Cosine Transform-Walsh–HadamardTransform – Wavelet transform –discrete and continuous- Haar transform – Properties.

UNIT-III

IMAGE ENHANCEMENT AND RESTORATION

Image Enhancement: Spatial Domain Methods. Image subtraction– Image averaging– Spatialfiltering - Smoothing, Sharpening filters–First and Second Derivatives– Histogram – Histogram –Equalization Frequency Domain Methods – Filtering - Smoothing andSharpening– Butterworth filterImage Restoration: Model of Image Degradation/ Restoration process – Linear, position–invariant degradation – Estimating the degradation function – Inverse filtering-Weinerfiltering–Unconstrained restoration.

UNIT-IV

IMAGE SEGMENTATION AND REPRESENTATION

Detection of discontinuities - Point, Line and Edge detection – Gradient operators – Edgelinking – Graph theoretic technique - Thresholding – global and adaptive – Region-basedsegmentation.Boundary representation – chain codes - Polygonal approximation– Signatures– skeletons –Boundary segments– Boundary descriptors: Shape numbers-Fourier descriptors-Regionaldescriptors–topological descriptors.

UNIT-V

IMAGE COMPRESSION

Introduction t o image compression– Lossy and Lossless compression – Sequential andProgressive Compression – Rate/Distortion optimization - compression metrics- Huffman coding – Run Length Coding – Predictive coding – DPCM –Transform coding –Vector quantization-Image compression standards: JPEG, JPEG2000.

TEXT BOOKS:

1. R. C. Gonzalez, R. E. Woods, ―Digital Image Processing, Prentice-Hall, 3rd Edition, 2008.

REFERENCES:

1.Anil K. Jain, ―Fundamentals of Digital Image Processing‖ Prentice Hall, 7th edition, 1989.
2.David Salomon, ―Data Compression‖, Springer Verlag NewYork Inc., 4th Edition, 2006.
3.Dr.S.Jayaraman, ― Digital Image Processing‖, Tata McGraw-Hill, 2009.
4.William K Pratt, ―Digital Image Processing‖, John Wiley and Sons, 2007, 4th Edition.
5.Dr.Sridhar ―Digital Image Processing‖, OUP India, 2011.

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU
****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A80502c.	**HIGH PERFORMANCE COMPUTING**	3	-	-	3

COURSE OBJECTIVES	
1	Study the Parallel Computing & Parallel Programming Platforms**.**
2	Study Principles of Parallel Algorithm Design
3	Study Analytical Modeling of Parallel Programs.

COURSE OUTCOMES	
CO1	To develop the skills required to implement high-performance software, including the interaction between algorithms, computer architecture and compilers.
CO2	To learn techniques for analyzing the performance ofprograms and their interaction with the underlying hardware
CO3	To understand features of modern processors that affect performance and be able to use these features in the designand optimization of high-performance software
CO4	To utilize techniques to automatically implement, optimize, and adapt programs to different platforms

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2			✓		✓		✓		✓	✓		
CO3		✓		✓							✓	
CO4	✓		✓			✓			✓			✓

UNIT I

INTRODUCTION TO PARALLEL COMPUTING & PARALLEL PROGRAMMING PLATFORMS

Motivating Parallelism, Scope of Parallel Computing, Implicit Parallelism: Trends in Microprocessor Architectures, Limitations of Memory System Performance, Dichotomy of Parallel Computing Platforms, Physical Organization of Parallel Platforms, Communication Costs in Parallel Machines, Routing Mechanisms for Interconnection Networks, Impact of Process- Processor Mapping and Mapping Techniques

UNIT II

PRINCIPLES OF PARALLEL ALGORITHM DESIGN

Preliminaries, Decomposition Techniques, Characteristics of Tasks and Interactions, Mapping Techniques for Load Balancing, Methods for Containing Interaction Overheads Parallel Algorithm Models

UNIT III

ANALYTICAL MODELING OF PARALLEL PROGRAMS

Sources of Overhead in Parallel Programs, Performance metrics for parallel systems, The effect of Granularity on performance, Scalability of Parallel Systems, Minimum execution time and minimum cost optimal execution time, Asymptotic analysis of Parallel programs, Other Scalability Metrics

UNIT IV

PROGRAMMING USING THE MESSAGE PASSING PARADIGM

Principles of Message – Passing Programming, The Building Blocks, MPI: The Message passing Interface, Overlapping Communication with Computation, Collective Communication and Computation Operations, Groups & Communicators

UNIT V

PROGRAMMING SHARED ADDRESS SPACE PLATFORMS

Thread Basics, POSIX Thread API, Synchronization Primitives in Pthreads, Controlling Thread and Synchronization Attributes, Thread Cancellation, Composite Synchronization Constructs, OpenMP: A standard for Directive Based Parallel Programming.

Text Books:

1. “Introduction to Parallel Computing “ by Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, Pearson Education, 2nd Edition 2009.

Reference Books:

1.“Parallel Programming- Techniques and applications using networked workstations and parallel computers” by Barry Wilkinson, Michael Allen Pearson Education, 2nd Edition 2007.

2. “Multi Core Programming – Increasing Performance through Software Multi-threading” by Shameem Akhter and Jason Roberts, Intel Press 2006.

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IV B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A80503a.	**Entrepreneurship Development**	3	-	-	3

UNIT 1:

Introduction to Entrepreneurship Definition of Entrepreneur, Entrepreneurial Traits, Entrepreneur vs. Manager, Entrepreneur vs Intrapreneur. The Entrepreneurial decision process. Role of Entrepreneurship in Economic Development, Ethics and Social responsibility of Entrepreneurs. Opportunities for Entrepreneurs in India and abroad. Woman as Entrepreneur.Creating and Starting the Venture, Sources of new Ideas, Methods of generating ideas, creating problem solving, product planning and development process.

UNIT II:

The Business Plan Nature and scope of Business plan, Writing Business Plan, Evaluating Business plans, Using and implementing business plans. Marketing plan, financial plan and the organizational plan, Launching formalities.

UNIT III:

Financing and Managing the new venture, Sources of capital, venture capital, angel investment, Record keeping, recruitment, motivating and leading teams, financial controls. Marketing and sales controls. E-commerce and Entrepreneurship, Internet advertising.

UNIT IV:

New venture Expansion Strategies and Issues, Features and evaluation of joint ventures, acquisitions, merges, franchising. Public issues, rights issues, bonus issues and stock splits.

Choosing location and layout, Issues related to Selection of layout.

UNIT V:

Production and Marketing Management Thrust of production management, Selection of production Techniques, plant utilization and maintenance, Designing the work place, Inventory control, material

handling and quality control. Marketing functions, market segmentation, market research and channels of distribution, Sales promotion and product pricing. Global aspects of Entrepreneurship.

Text Books:

1. Robert Hisrich, & Michael Peters: Entrepreneurship, TMH, 5th Edition
2. Dollinger: Entrepreneurship,4/e, Pearson, 2004.

REFERENCES:

1. Vasant Desai: Dynamics of Entrepreneurial Development and management, Himalaya Publishing House, 2004.
2. Harvard Business Review on Entrepreneurship. HBR Paper Back, 1999.
3. Robert J.Calvin: Entrepreneurial Management, TMH, 2004.
4. Gurmeet Naroola: The Entrepreneurial Connection, TMH, 2001.
5. Bolton & Thompson: Entrepeneurs- Talent, Temperament, Technique, Butterworth Heinemann, 2001.
6. Agarwal :Indian Economy, Wishwa Prakashan 2005.
7. Dutt & Sundaram: Indian Economy. S. Chand, 2005.
8. Srivastava: Industrial Relations & Labour Laws, Vikas, 2005.
9. Aruna Kaulgud: Entrepreneurship Management by. Vikas publishing house, 2003.
10. Thomas W. Zimmerer & Norman M. Scarborough: Essential of Entrepreneurship and small business management, PHI, 4/e, 2005.
11. Mary Coulter: Entrepreneurship in Action, PHI, 2/e, 2005.
12. Kaplan: Patterns of Entrepreneurship, Willey, 2005.
13. ND Kapoor: Industrial Law, Sultan Chand & Sons, 2005.

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****** DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ******
IV B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A80503b.	NATURAL LANGUAGE PROCESSING	3	-	-	3

COURSE OBJECTIVES	
1	Understand current methods for statistical approaches to machine translation.
2	Understand language modeling.
3	Understand machine learning techniques used in NLP.

COURSE OUTCOMES	
CO1	Apply fundamental algorithms and techniques in the area of natural language processing (NLP).
CO2	Describe approaches to syntax and semantics in NLP.

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√		√	√	√	√		√	√	√	√
CO2	√	√	√		√		√		√	√		

UNIT – I

Introduction to Natural Language, Applications of NLP, Corpora and Corpus Analysis, Lexicon and Morphology, Syntax and Semantics.

UNIT II

Language Modeling: Introduction, n-gram models, Smoothing: Interpolation and Backoff.

UNIT III

Introduction to Machine Translation: History, Rule Based MT, Direct Transfer & INTERLINGUA Approaches, MT Evaluation.

UNIT IV

Statistical MT: Parallel Corpus and Alignment, Lexical Translation Model, Decoding Algorithms.

UNIT V

Applications: Automatic Text Categorization, Text Summarization, Information Extraction, Sentiment Analysis.

Text Books:

1. "Natural Language Processing: An Information Access Perspective", Ess Ess Publications, Kavi Narayana Murthy, 2006.

2. "Foundations of Statistical Natural Language Processing", Christopher Manning, MIT Press, 1999.

Reference Books:

1. James A.. Natural language Understanding 2e, Pearson Education, 1994
2. Bharati A., Sangal R., Chaitanya V.. Natural language processing: a Paninian perspective, PHI, 2000
3. Siddiqui T., Tiwary U. S.. Natural language processing and Information retrieval, OUP, 2008

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IV B.TECH – II SEMESTER

Subject Code	Title of the Subject	L	T	P	C
17A80503c.	**Machine Learning**	3	-	-	3

COURSE OBJECTIVES	
1	To understand the basic theory underlying machine learning.
2	To be able to formulate machine learning problems corresponding to different applications.
3	To understand a range of machine learning algorithms along with their strengths and weaknesses.
4	To be able to apply machine learning algorithms to solve problems of moderate complexity

COURSE OUTCOMES	
CO1	Ability to understand what is learning and why it is essential to the design of intelligent machines.
CO2	Ability to design and implement various machine learning algorithms in a wide range of real-world applications.
CO3	Acquire knowledge deep learning and be able to implement deep learning models for language, vision, speech, decision making, and more

Mapping between Course Outcomes and Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓		✓		✓	✓		
CO2			✓		✓		✓		✓	✓		
CO3		✓		✓							✓	
CO4	✓		✓			✓			✓			✓

UNIT I INTRODUCTION

Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces and Candidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.

UNIT II NEURAL NETWORKS AND GENETIC ALGORITHMS

Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evalution and Learning.

UNIT III BAYESIAN AND COMPUTATIONAL LEARNING

Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.

UNIT IV INSTANT BASED LEARNING

K- Nearest Neighbour Learning – Locally weighted Regression – Radial Bases Functions – Case Based Learning.

UNIT V ADVANCED LEARNING

Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning

TEXT BOOKS:

1. Machine Learning – Tom M. Mitchell, - MGH

REFERENCE BOOKS

1. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis