Bapatla Engineering College

(*Autonomous*)

BAPATLA

SYLLABUS

(w.e.f. 2016-2017)

4 Year B.Tech Program

of

Computer Science and Engineering

Bapatla Engineering College:: Bapatla

(Autonomous under Acharya Nagarjuna University)

(Sponsored by Bapatla Education Society)

BAPATLA - 522102 Guntur District, A.P.

www.becbapatla.ac.in

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
CH, CS, EI, IT, ME Branches
With Effective from 2014-2015 Academic Year
First Year B.Tech., (SEMESTER – I)

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14MA101	Engineering Mathematics – I	4	1	0	0	5	40	60	100	4
14PH102	Engineering Physics – I	4	0	0	0	4	40	60	100	3
14CY103	Engineering Chemistry – I	4	0	0	0	4	40	60	100	3
14EE104	Basic Electrical and Electronics Engineering	4	0	0	0	4	40	60	100	3
14ES105	Environmental Studies	4	0	0	0	4	40	60	100	3
14EG106	Engineering Graphics	4	1	0	1	6	40	60	100	4
14CYL101	Chemistry Lab	0	0	3	0	3	40	60	100	2
14HWL102	Hardware Lab	0	0	3	0	3	40	60	100	2
14WSL103	Workshop	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

CH, CS, EI, IT, ME Branches

With Effective from 2014-2015 Academic Year

First Year B.Tech., (SEMESTER – II)

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14MA201	Engineering Mathematics – II	4	1	0	0	5	40	60	100	4
14PH202	Engineering Physics – II	4	0	0	0	4	40	60	100	3
14CY203	Engineering Chemistry – II	4	0	0	0	4	40	60	100	3
14EL204	Communicative English	4	0	0	0	4	40	60	100	3
14EM205	Engineering Mechanics	4	1	0	0	5	40	60	100	4
14CP206	Problem Solving with Programming	4	0	0	1	5	40	60	100	3
14PHL201	Physics lab	0	0	3	0	3	40	60	100	2
14ELL202	English Communication Skills Lab	0	0	3	0	3	40	60	100	2
14CPL203	Problem Solving with Programming Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	360	540	900	26

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
Second Year B.Tech., (SEMESTER – III)
For
CSE Branch
With Effect from 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14MA301	Engineering Mathematics – III	4	0	0	0	4	40	60	100	3
14CS302	Discrete Mathematical Structures	4	1	0	0	5	40	60	100	4
14CS303	Digital Logic Design	4	0	0	0	4	40	60	100	3
14CS304	Operating System	4	0	0	1	5	40	60	100	3
14CS305	Data Structures	4	1	0	0	5	40	60	100	4
14CS306	Object Oriented Programming	4	0	0	0	4	40	60	100	3
14ELL301	Soft Skills Lab	0	0	3	0	3	40	60	100	2
14CSL302	Data Structures Lab	0	0	3	0	3	40	60	100	2
14CSL303	OOPS Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Second Year B.Tech., (SEMESTER – IV)

For

CSE Branch

With Effect from 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14MA401	Engineering Mathematics - IV	4	0	0	0	4	40	60	100	3
14CS402	Professional Ethics and Human Values	4	0	0	0	4	40	60	100	3
14CS403	Computer Organization	4	1	0	0	5	40	60	100	4
14CS404	Design and Analysis of Algorithms	4	1	0	0	5	40	60	100	4
14CS405	GUI Programming	4	0	0	1	5	40	60	100	3
14CS406	Web Technologies	4	0	0	0	4	40	60	100	3
14CSL401	DAA Lab	0	0	3	0	3	40	60	100	2
14CSL402	GUI Programming Lab	0	0	3	0	3	40	60	100	2
14CSL403	Web Technologies Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
Third Year B.Tech., (SEMESTER – V)
For
CSE Branch
With Effect from 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14CS501	Software Engineering	4	0	0	0	4	40	60	100	3
14CS502	Automata Theory & Formal Languages	4	0	0	0	4	40	60	100	3
14CS503	Microprocessors & Microcontrollers	4	0	0	1	5	40	60	100	3
14CS504	Database Management Systems	4	1	0	0	5	40	60	100	4
14CS505	Enterprise Programming-I	4	1	0	0	5	40	60	100	4
14CS506	Elective – I	4	0	0	0	4	40	60	100	3
14CSL501	MPMC Lab	0	0	3	0	3	40	60	100	2
14CSL502	RDBMS Lab	0	0	3	0	3	40	60	100	2
14CSL503	Enterprise Programming-I Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

Elective I

14CS506(A)	Artificial Intelligence
14CS506(B)	Principles of Programming Languages
14CS506(C)	Machine Learning
14CS506(D)	Graph Theory

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
Third Year B.Tech., (SEMESTER – VI)
For
CSE Branch
With Effect from 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14CS601	Introduction to Data Analytics	4	0	0	0	4	40	60	100	3
14CS602	Compiler Design	4	0	0	0	4	40	60	100	3
14CS603	Computer Networks	4	1	0	0	5	40	60	100	4
14CS604	Enterprise Programming-II	4	1	0	0	5	40	60	100	4
14CS605	Cloud and Mobile Application Development	4	0	0	1	5	40	60	100	3
14CS606	Elective - II	4	0	0	0	4	40	60	100	3
14CSL601	Introduction to Data Analytics Lab	0	0	3	0	3	40	60	100	2
14CSL602	Enterprise Programming-II Lab	0	0	3	0	3	40	60	100	2
14CSL603	Cloud and Mobile App. Dev. Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

Elective II

14CS606/A	Natural Language Processing
14CS606/B	Parallel Processing
14CS606/C	Digital Image Processing
14CS606/D	Advanced Computer Architecture

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
Final Year B.Tech., (SEMESTER – VII)
For
CSE Branch
With Effect from 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14CS701	Introduction to Cyber Security	4	0	0	0	4	40	60	100	3
14CS702	Object Oriented Analysis and Design	4	0	0	0	4	40	60	100	3
14CS703	Advanced Data Analytics	4	1	0	0	5	40	60	100	4
14CS704	Wireless Networks	4	1	0	0	5	40	60	100	4
14CS705	Elective-III	4	0	0	0	4	40	60	100	3
14OE706	Open Elective	4	0	0	0	4	40	60	100	3
14ELL701	Business Communication and Presentation Skills Lab	0	0	2	0	2	20	30	50	1
14CSL702	Introduction to Cyber Security Lab	0	0	3	0	3	40	60	100	2
14CSL703	Advanced Data Analytics Lab	0	0	3	0	3	40	60	100	2
14CSL704	Term Paper	0	0	2	0	2	20	30	50	1
	TOTAL	24	2	10	0	36	**360**	**540**	**900**	**26**

Elective III

14CS705(A)	Software Project Management
14CS705(B)	Distributed Systems
14CS705(C)	E Commerce
14CS705(D)	Software Quality Management

Open Elective 14OE706/

CH01	Industrial Pollution and Control
CH02	Energy Engineering

CE01	Air Pollution and Control
CE02	Remote Sensing and GIS
CS01	Database Management Systems
CS02	Java Programming
EE01	Optimization Techniques
EE02	Non-Conventional Energy Sources
EC01	Consumer Electronics
EC02	Embedded Systems
EI01	Virtual Instrumentation using LABVIEW
EI02	Sensors and Transducers
IT01	Web Programming
IT02	Mobile Application Development
ME01	Automobile Engineering
ME02	Refrigeration and Air Conditioning
BR01	Automation Technology

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER – VIII)

For

CSE Branch

With Effect from 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14ME801	Industrial Management & Entrepreneurship Development	4	0	0	0	4	40	60	100	3
14CS802	Advanced Cyber Security	4	1	0	0	5	40	60	100	4
14CS803	Elective - IV	4	0	0	1	5	40	60	100	3
14CS804	Elective - V	4	0	0	0	4	40	60	100	3
14CSPR801	Project Work	0	0	12	0	12	50	100	150	10
14CSL801	Advanced Cyber Security Lab	0	0	3	0	3	40	60	100	2
	TOTAL	16	1	15	1	33	**250**	**400**	**650**	**25**

Elective IV

14CS803(A)	Software Testing Methodologies
14CS803(B)	Web Mining
14CS803(C)	Advanced Database Management Systems
14CS803(D)	Bioinformatics

Elective V

14CS804(A)	Real Time Systems
14CS804(B)	Application Programming using Python
14CS804(C)	High speed Networks
14CS804(D)	Adhoc and Sensor Networks

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture T: Tutorial P: Practical S: Self Study

ENGINEERING MATHEMATICS – I

(Common for all branches)

I B.Tech – I Semester (Code: 14MA101)

Lectures	:	4 Periods/Week, Tutorial 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14MA101.1	The mathematical skills derived from this course form a necessary base to analytical and design concepts encountered in the Program.
14MA101.2	Geometrical transformations using basic analytical concepts and Approximating the functions by using Taylor's series.
14MA101.3	Representation of periodic functions corresponding to objects following periodic phenomena in terms of sine and cosine functions.
14MA101.4	Transforming line integrals, double and triple integrals into one another in solving mathematical models of some engineering applications.

UNIT-1 (16Periods)

Matrix Algebra: Rank of a Matrix, Linear Independence, Vector Space, Solutions of Linear Systems, Inverse of a Matrix by Gauss-Jordan Elimination, Vector Spaces, Inner Product Spaces, Linear Transformations. Eigen Values, Eigen Vectors, Some applications of Eigen value problems. Symmetric, Skew-Symmetric and Orthogonal Matrices.

UNIT-2 (15Periods)

Matrix Algebra: Complex Matrices: Hermitian, Skew-Hermitian and Unitary, Similarity of Matrices, Basis of Eigen Vectors, Diagonalization.

Differential Calculus: Rolle's Theorem, Lagrange's Mean Value Theorem and Taylor's Theorem (without Proofs), Taylor's and, Maclaurin's Series for functions of one variable. Maxima and Minima of functions of Two Variables, Lagrange's method of Multipliers.

UNIT-3 (15Periods)

Fourier Series: Periodic Functions, Trigonometric Series, Fourier Series, Functions of Any Period P = 2L, Even and Odd Functions, Half Range Expansions, Complex Fourier Series.

UNIT-4 (14Periods)

Integral Calculus: Evaluation of double integrals (Cartesian & Polar), Changing the order of integration, Evaluation of triple integrals, Applications of triple integrals to find area and volume.

Text Books :

1. Erwin Kreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons

References :

1. "Advanced Engineering Mathematics", Peter V. O'Neil, Thomsons Brooks/Cole.

	2. “Advanced Calculus”, Murray R Spiegel, Schaum’s outline series.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14MA101.1	3	1	-	2	-	-	-	-	-	-	-	-	1	-	-
14MA101.2	3	1	-	1	-	-	-	-	-	-	-	-	1	-	-
14MA101.3	3	1	-	2	-	-	-	-	-	-	-	-	3	-	-
14MA101.4	3	1	-	2	-	-	-	-	-	-	-	-	1	-	-

ENGINEERING PHYSICS – I

(Common for all branches)

I B.Tech – I Semester (Code: 14PH102)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14PH102.1	Identify the nature of Interference, Diffraction and Polarization.
14PH102.2	Apply the Lasers and Optical fibers in different fields.
14PH102.3	Analyse electromagnetic principles in electrical and electronic circuits.
14PH102.4	Study about quantum mechanics and its applications.

UNIT-1 (13Periods)

OPTICS:

INTERFERENCE: Coherence, spatial and temporal coherences, interference due to thin films (reflected system), cosine law, anti-reflection coating, Michelson interferometer and its applications, (determination of wavelengths of monochromatic light and resolution of two nearby wavelengths)., Newton's rings theory and applications (determination of wavelength of light, and refractive index of transparent liquid).

DIFFRACTION: Fresnel &Fraunhoffer diffraction, Fraunhoffer diffraction due to single slit, plane diffraction grating, dispersive and resolving powers of a grating.

POLARISATION: Introduction, double refraction,Nicol prism, quarter wave plate, half wave plate, production and detection of circularly and elliptically polarised lights and optical activity, Electro optic effect(Kerr effect),Magneto optic effect(Faraday effect).

UNIT-2 (13Periods)

LASERS & FIBER OPTICS:

LASERS: Properties of lasers**,** Spontaneous and stimulated emissions, Population inversion, Solid state (Ruby) laser, Gas(He-Ne) laser, semiconductor (Ga-As) laser, Applications.

HOLOGRAPHY: Principle, recording and reproduction of holography, Applications.

FIBER OPTICS: Structure and types of optical fibers, acceptance angle, Numerical aperture, losses in optical fibers, fiber optic communication and its advantages.

UNIT-3 (12Periods)

ELECTRICITY & MAGNETISM:

Gauss's law in static electricity (qualitative only), Gauss's law of magnetism, circulating charges, Cyclotron-construction, working and limitations, Hall effect and its applications, displacement current, Maxwell's equations (qualitative treatment), E M oscillations, velocity of EM waves, energy transport and the pointing vector, AC circuit containing series LCR circuit-resonance condition and quality factor.

UNIT-4 (12Periods)

MODERN PHYSICS:

Dual nature of light, de-Broglie's concept of matter waves, Davisson-Germer electron diffraction experiment, Heisenberg's uncertainty principle and applications (non-existence of

electron in a nucleus and finite width of spectral lines), one dimensional time- independent and dependent Schrödinger wave equations, physical significance of wave function, applications of time-independent Schrödinger wave equation to particle in a box(one dimensional), tunneling, the scanning tunneling microscope.	
Text Books :	1. "A Text Book of Engineering Physics", M.N. Avadhanulu, P.G. Kshirasagar, S.Chand& Co.,(Edition – 2013).
References :	1. "Engineering physics"byR.K.Gour and S.L.Gupta. Dhanpatrai publications. 2. "Basic Engineering Physics" by P.Srinivasarao&K.Muralidhar, Himalaya publications. 3. "Engineering physics" by M.R.Sreenivasan. New age international publications 4. "Engineering physics" by Palaniswamy. Scitech publications

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14PH102.1	3	-	-	-	-	3	-	-	-	-	2	3	-	-	-
14PH102.2	3	-	3	3	3	3	2	-	-	-	-	2	-	-	-
14PH102.3	3	3	2	2	2	3	-	-	-	-	-	3	-	-	-
14PH102.4	3	3	-	2	2	2	-	-	-	-	-	3	-	-	-

ENGINEERING CHEMISTRY – I

(Common for all branches)

I B.Tech – I Semester (Code: 14CY103)

Lectures	:	4 Periods/Week, Tutorial 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CY103.1	Know the characteristics of water for various purposes and produce soft water for industrial use at cheaper cost.
14CY103.2	Find the quality & suitability of water for various purposes and develop innovative methods to produce potable water, and assess applications of heterogeneous systems through phase diagram.
14CY103.3	Have the capacity of applying energy sources efficiently and economically for various needs.
14CY103.4	Apply their knowledge in designing and preparing different materials and their utility at various needs to overcome all the problems that commonly arise in construction, automobile, metallurgical industries etc.

UNIT-1 (13Periods)

Water Technology: (Industrial Purpose)

Characteristics: **Alkalinity** – types of alkalinity and determination (Including simple problems); **Hardness** – types, units and estimation by EDTA method (Including simple problems)

Boiler feed water - Scales, Sludges, Caustic embrittlement, boiler corrosion, Priming and foaming;

Internal conditioning - phosphate, calgon and carbonate methods

External conditioning - Ion exchange process, Lime Soda process (Including simple problems)

UNIT-2 (12Periods)

Domestic water treatment – WHO Guidelines, Potable water, Sedimentation, Coagulation, Filtration (Slow sand filter) and disinfection methods: Chlorination - break point chlorination, ozonization, UV treatment.

Desalination- Electro Dialysis and Reverse Osmosis.

Phase rule - Statement and explanation of terms involved; One component system – water system; Condensed phase rule, Thermal analysis - Thermal behavior of pure and impure solids, Eutectic system, Eutectic mixture & Eutectic point, Construction of phase diagram for Bi-Cd system by thermal analysis, Simple eutectic systems (lead-silver system only).

UNIT-3 (13Periods)

Energy Sources: (Fuels)

Classification of fuels; Calorific value of fuels (lower, higher)

Solid fuels: determination of calorific value (Bomb Calorimeter), Coal ranking, Carbonization of coal (Otto-Hoffman by-product method); Proximate and ultimate analysis of coal.

Petroleum based: Petroleum processing and fractions; Cracking – catalytic cracking method (fixed bed); Synthetic petrol: Bergius process, Knocking and anti- knocking Agents, Octane

number and Cetane number;
Gaseous fuels: CNG and LPG,

UNIT-4 (12Periods)

Engineering Materials:

Refractories: Classification – Acidic, Basic and Neutral refractories; Properties: refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling; Preparation, Properties and applications of alumina, magnesite and zirconia bricks,

Composites: Introduction Constituents of Composites, types- Fibre reinforced Particulate and Layered composites and their applications.

Lubricants: Mechanism of lubrication, Liquid lubricants - properties: viscosity index, flash and fire points, cloud and pour points, oiliness; Solid lubricants - graphite and molybdenum sulphide.

Text Books :

1. P.C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 15th edition (2010).

References :

1. Essential Of Physical Chemistry by ArunBahl, B.S. Bahl, G.D.Tuli, by ArunBahl, B.S. Bahl, G.D.Tuli, Published by S Chand Publishers
2. Text Book of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).
3. Engineering Chemistry by K. Maheswaramma, Pearson publishers 2015.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CY103.1				3	3			3	3	3	3			3	3
14CY103.2				2	2			2	2	2	2		2	2	2
14CY103.3				2	2			2	2	2	2		2	2	2
14CY103.4				3	3				3		3		3	3	

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common for all branches)

I B.Tech – I Semester (Code: 14EE104/14EE204)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14EE104.1	Solve Problems involving with DC and AC excitation sources in electrical circuits
14EE104.2	Compare properties of magnetic materials and its applications
14EE104.3	Analyze construction, principle of operation, application and performance of DC machines andAC machines
14EE104.4	Explore characteristics and applications of semi conductor diode and transistor family

UNIT-1 (13Periods)

Basic Concepts of Electric Circuits: Introduction, Electric Current, Ohm's Law, Work, Power, and Energy, Dynamically Induced EMF and Statically Induced EMF, Self-induced EMF and Mutually Induced EMF, Self-inductance of a Coil, Mutual Inductance, Energy Stored in a Magnetic Field, Electrical Circuit Elements, Energy Stored in a Capacitor, Capacitor in Parallel and in Series.

DC Networks and Network Theorems: DC Network Terminologies, Voltage and Current Sources, Series Parallel Circuits, Voltage and Current Divider Rules, Kirchhoff's Laws, Maxwell's Mesh Current Method, Nodal Voltage Method (Nodal Analysis), Network Theorems (Superposition Theorem, Thevenin's Theorem, Norton's Theorem).

UNIT-2 (12Periods)

AC Fundamentals: Introduction, Generation of Alternating Voltage in an Elementary Generator, Concept of Frequency, Cycle, Time Period, Instantaneous Value, Average Value, and Maximum Value, Sinusoidal and Non-sinusoidal Wave Forms, Concept of Average Value and Root Mean Square (RMS) Value of an Alternating Quantity, Analytical Method of Calculation of RMS Value, Average Value, and Form Factor, RMS and Average Values of Half-wave rectified Alternating Quantity, Concept of Phase and Phase Difference.

Transformers: Introduction, Basic Principle and Constructional Details, EMF Equation.

UNIT-3 (13Periods)

Semiconductor Devices: Introduction, Review of Atomic Theory, Binding Forces Between Atoms in Semiconductor Materials, Extrinsic Semiconductors, Semiconductor Diodes; Volt-ampere Characteristic of a Diode, An Ideal Diode, Diode Parameters and Diode Ratings, Zener Diode; Zener Diode As Voltage Regulator, Zener Diode As a Reference Voltage, Bipolar Junction Transistors; Working of a n-p-n Transistor, Working of a p-n-p Transistor, Transistor Configurations, Transistor As an Amplifier, Transistor As a Switch, Rectifiers and Other Diode Circuits.

Rectifiers: Introduction, Half-Wave, Full wave Rectifiers and their analysis, Comparison of Half-Wave and Full-Wave Rectifiers.

UNIT-4	(12Periods)
Digital Electronics: Introduction, Number System, Octal Number System, Hexadecimal Number System, Application of Binary Numbers in Computers, Logic Gates, Boolean Algebra, De Morgan's Theorem, Combinational Circuits, Simplification of Boolean Expressions Using De Morgan's Theorem. **Integrated Circuits:** Introduction, Fabrication of Monolithic ICs, Hybrid Integrated Circuits, Linear and Digital ICs.	
Text Books :	1. "Basic Electrical and Electronics Engineering", S.K. Bhattacharya, Pearson Publications
References :	1. "Basic Electrical, Electronics and Computer Engineering", Muthusubramanian R, Salivahanan S and Muraleedharan K A, Tata McGraw Hill, Second Edition, (2006). 2. "Basics of Electrical and Electronics Engineering", Nagsarkar T K and Sukhija M S, Oxford press University Press.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14EE104.1	2	2		2				2						2	
14EE104.2	3	3			3						3			3	3
14EE104.3	1	1						1							
14EE104.4	2	2				2					2		2		

ENVIRONMENTAL STUDIES

(Common for all branches)

I B.Tech – I Semester (Code: 14ES105/14ES205)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14ES105.1	Develop an appreciation for the local and natural history of the area.
14ES105.2	Hope for the better future of environment in India which is based on many positive factors like Biodiversity, successive use of renewable energy resources and other resources, increasing number of people's movements focusing on environment.
14ES105.3	Know how to manage the harmful pollutants.
14ES105.4	Gain the knowledge of Environment.
14ES105.5	Create awareness among the youth on environmental concerns important in the long-term interest of the society.

UNIT-1 (13Periods)

Introduction: Definition, Scope and Importance, Need for public awareness. Ecosystems: Definition, Structure and Functions of Ecosystems, types - Forest, Grassland, Desert, Aquatic (Marine, pond and estuaries).

Biodiversity: Definition and levels of Biodiversity; Values of Biodiversity - Consumptive, Productive, Social, Aesthetic, Ethical and Optional; Threats and Conservation of Biodiversity; Hot Spots of Biodiversity, Bio-geographical Classification of India, India as a mega diversity nation.

UNIT-2 (12Periods)

Natural resources: Land: Land as a resource, Causes and effects of land degradation - Soil erosion, Desertification. Forest: Use of forests, Causes and effects of deforestation, Afforestation, Mining - benefits and problems. Water: Uses, floods and drought, Dams - benefits and problems. Energy: Importance of energy, Renewable and Non-renewable energy resources.

Sustainability: Definition, Concept and Equitable use of resources for sustainable development; Rain water harvesting and Watershed management.

UNIT-3 (13Periods)

Pollution: Definition; Causes, effects and control of air, water and nuclear pollution; Solid Waste: urban, Industrial and hazardous wastes; Integrated waste management - 3R approach, composting and vermicomposting.

Environmental issues: Greenhouse effect & Global warming, Ozone layer depletion, Acid rains, Green Revolution, Population Growth and environmental quality, Environmental Impact Assessment.

UNIT-4	(12Periods)
Environmental acts: Water and air (Prevention and Control of pollution) acts, Environmental protection act, Forest Conservation act. Case Studies: Silent Valley Project, Chipko movement, Narmada BachaoAndolan, Bhopal Tragedy, Mathura Refinery and TajMahal, Chernobyl Nuclear Disaster and Ralegan Siddhi (Anna Hazare). **Field work:** Visit to a local area to document environmental assets – Pond/Forest/Grassland. Visit to a local polluted site- Urban and industry/ Rural and Agriculture.	
Text Books :	1. "Environmental Studies" by Benny Joseph, Tata McGraw-Hill Publishing Company Limited, New Delhi. 2. "Comprehensive environmental studies"- JP Sharma, Laxmi Publications.
References :	1. "Environmental studies", R.Rajagopalan, Oxford University Press. 2. "Introduction to Environmental Science", Anjaneyulu Y, B S Publications 3. "Environmental Science", 11th Edition – Thomson Series – By Jr. G. Tyler Miller.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14ES105.1	3	3			3		3			3	3			3	3
14ES105.2	2	2			2		2			2	2		2	2	2
14ES105.3	2	2			2		2			2	2		2	2	2
14ES105.4	3	3					3				3		3	3	
14ES105.5	3	3			3		3			3	3			3	3

Engineering Graphics

(Common for all branches)

I B.Tech – I Semester (Code: 14EG106/14EG206)

Lectures	:	4 Periods+ Tutorial 1+ Self-study 1/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14EG106.1	Draw projections of points and projections of lines using Auto CAD
14EG106.2	Plot projections of surfaces like circle, square and rhombus and solids like Prisms and pyramids
14EG106.3	Convert the of Orthographic views into isometric views of simple objects
14EG106.4	Generate the of pictorial views into orthographic views of simple castings

UNIT-1

INTRODUCTION: Introduction to Drawing instruments and their uses, geometrical construction procedures.

CURVES: Conic sections – general construction methods for ellipse, parabola and hyperbola. Other methods to construct ellipse only, cycloid, involute of a circle.

UNIT-2

METHOD OF PROJECTIONS: Principles of projection - First angle and third angle projection of points. Projection of straight lines. Traces of lines.

UNIT-3

PROJECTIONS OF PLANES: Projections of plane figures: circle, square, rhombus, rectangle, triangle, pentagon and hexagon.

UNIT-4

PROJECTIONS OF SOLIDS: Projections of Cubes, Prisms, Pyramids, Cylinders and Cones with varying positions.

UNIT-5

ISOMETRIC PROJECTIONS: Isometric Projection and conversion of Orthographic views into isometric views. (Treatment is limited to simple objects only).

ORTHOGRAPHIC PROJECTIONS: Conversion of pictorial views into Orthographic views. (Treatment is limited to simple castings).

Text Books :	1. "Engineering Drawing" by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand). (First angle projection)
References :	1. "Engineering Drawing" by Dhananjay A Jolhe, Tata McGraw hill publishers 2. "Engineering Drawing" by Prof.K.L.Narayana& Prof. R.K.Kannaiah.

Course Outcome, Program Objectives & Program Specific Objectives Mapping															
	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14EG106.1	3	3												3	
14EG106.2	2	2												2	
14EG106.3	2	2												2	
14EG106.4	3	3												3	

CHEMISTRY LABORATORY

(Common for all branches)

I B.Tech – I Semester (Code: 14CYL101/14CYL201)

Practicals	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CYL101.1	Know the characteristics of water for various purposes and produce soft water for industrial use at cheaper cost.
14CYL101.2	Find the quality & suitability of water for various purposes and develop innovative methods to produce potable water, and assess applications of heterogeneous systems through phase diagram.
14CYL101.3	Have the capacity of applying energy sources efficiently and economically for various needs.
14CYL101.4	Apply their knowledge in designing and preparing different materials and their utility at various needs to overcome all the problems that commonly arise in construction, automobile, metallurgical industries etc.

LIST OF EXPERIMENTS

1. **Introduction to Chemistry Lab** (the teachers are expected to teach fundamentals likeCalibration of Volumetric Apparatus, Primary, Secondary Solutions, Normality, Molarity, Molality etc. and error, accuracy, precision, theory of indicators, use of volumetric titrations).
2. **Volumetric Analysis:**
   a. Estimation of Washing Soda.
   b. Estimation of Active Chlorine Content in Bleaching Powder
   c. Estimation of Mohr's salt by permanganometry.
   d. Estimation of Magnesium by EDTA method
3. **Analysis of Water:**
   a. Determination of Alkalinity of Tap water.
   b. Determination of Total Hardness of ground water sample by EDTA method
   c. Determination of Salinity of water sample
4. **Estimation of properties of oil**:
   a. Estimation of Acid Number
   b. Estimation of Saponification value
5. **Preparations:**
   a. Preparation of Soap
   b. Preparation of Urea-formaldehyde resin
   c. Preparation of Phenyl benzoate
6. **Demonstration Experiments (Any two of the following):**
   a. Determination of p^H of given sample by different methods.
   b. Determination of conductivity of given sample by conductometer.

Text Books :	1. Practical Engineering Chemistry by K.Mukkanti, Etal, B.S. Publicaitons, Hyderabad.

	2. Inorganic quantitative analysis, Vogel.
References :	1. Text Book of engineering chemistry by R.n. Goyal and HarrmendraGoel. 2. A text book on experiments and calculations- Engineering Chemistry. S.S. Dara. 3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CYL101.1				3	3			3	3	3	3			3	3
14CYL101.2				2	2			2	2	2	2		2	2	2
14CYL101.3				2	2			2	2	2	2		2	2	2
14CYL101.4				3	3				3		3		3	3	

ENGLISH COMMUNICATION SKILLS LABORATORY

I B.Tech – II Semester (Code: 14ELL102/14ELL202)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14ELL102.1	To comprehend the importance, barriers and strategies of listening skills in English.
14ELL102.2	To illustrate and impart practice Phonemic symbols, stress and intonation.
14ELL102.3	To practice oral skills and receive feedback on learners' performance.
14ELL102.4	To practice language in various contexts through pair work, role plays, group work and dialogue conversations

LIST OF EXPERIMENTS

UNIT-I: Functional English

Introducing Yourself & Others-Greeting & Parting-Congratulating-Giving Suggestions & Advices-Expressing Opinions-Inviting People-Requesting-Seeking Permission-Giving Information- Giving Directions- Sympathizing-Convincing People-Complaining-Apologizing-Thanking Others- Shopping- Travelling- Conversational Gambits.

UNIT-II: Phonetics (Oral drills)

Stress- Rhythm & Intonation.

UNIT-III Vocabulary Development & Oratory Skills

Classified Vocabulary- Idioms - Phrasal verbs - Words often confused- Analogous words-Corporate Words - JAM- Elocution- Debate.

UNIT-IV Manners and Etiquette

Giving & Receiving Feedback -Telephone Etiquette - Gender Sensitive Language.

References:	1. J.D. O' Connor (1984): Better English pronunciation Cambridge University Press 2. Jack C Richards (2015): New Interchange (4rth Edition) , CUP. 3. Grant Taylor (2001: English Conversation Practice, McGraw Hill. 4. MichealMcCarthy, Felicity O Dell (1994): English Vocabulary in Use, CUP.
Software:	Buzzers for conversations, New Interchange series English in Mind series, telephoning in English Speech Solutions, A course in Listening and Speaking Face to Face series

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14ELL102.1	3	3	3	3								3	3	3	3
14ELL102.2	3	3	3	3	3								3		3
14ELL102.3		2		2	2				2				2		2
14ELL102.4	3	3			3					3	3			3	3

WORKSHOP

(Common for all branches)

I B.Tech – I Semester (Code: 14WSL103/14WSL203)

Practicals	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14WSL103.1	The Basics of tools and equipment used in Carpentry, Tin Smithy, Welding and House Wiring. • The production of simple models in the above four trades
14WSL103.2	The Basics of tools and equipment used in Carpentry, Tin Smithy, Welding and House Wiring. • The production of simple models in the above four trades

LIST OF EXPERIMENTS

1. **Carpentry**
   a. Half Lap joint
   b. Dovetail joint
   c. Mortise &Tenon joint
2. **Welding using electric arc welding process/gas welding**
   a. Lap joint
   b. Tee joint
   c. Butt joint
3. **Sheet metal operations with hand tools**
   a. Trapezoidal tray
   b. Funnel
   c. T-joint
4. **House wiring**
   a. To control one lamp by a single switch
   b. To control two lamps by a single switch
   c. Stair-case wiring

Text Books :	
References :	Kannaiah P. & Narayana K. C., "Manual on Work Shop Practice", Scitech Publications, Chennai, 1999.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14WSL103.1	3	3					3		3					3	
14WSL103.2	2		2		2			2	2				2		
14WSL103.3	2	2		2							2		2		2
14WSL103.4	2	2			2	2	2			2		2		2	

ENGINEERING MATHEMATICS – II I B.Tech – II Semester (Code: 14MA201)					
Lectures	:	4 Periods/Week, Tutorial 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14MA201.1	Solving engineering problems that can be modeled as ordinary differential equations without finding general solutions.
14MA201.2	Solving engineering problems that can be modeled as ordinary differential equations without finding general solutions.
14MA201.3	Solving linear differential equations by using Laplace Transformation techniques.
14MA201.4	Understanding line, surface and volume integrals and their relations.

UNIT-1 (16Periods)

First Order Differential Equations: Basic concepts, Geometrical meaning, Separable Differential Equations, Exact Differential Equations, Integrating Factors, Linear Differential Equations, Bernoulli's Equation, Orthogonal Trajectories of curves, Some Engineering Applications: Growth-Decay and Newton's Law of Cooling.

UNIT-2 (15Periods)

Linear Differential Equations of Second Order: Homogeneous Linear Equations of Second Order, Second Order Homogeneous Equations with Constant Coefficients, Case of Complex Roots, Euler-Cauchy Equations, Non-Homogeneous Equations, Solution by Undetermined Coefficients, Solution by Variation of Parameters, Applications-Modeling of Electric Circuits.

UNIT-3 (15Periods)

Laplace Transforms: Laplace Transform, Inverse Transform, Linearity, Shifting, Transforms of Derivatives and Integrals, Differential Equations, Unit Step Function, Second Shifting Theorem, Dirac's Delta Function, Convolution theorem (without proof).

UNIT-4 (14Periods)

Vector calculus: Scalar and vector point functions, Gradient of a scalar field, Directional derivative, Divergence of a vector field, curl of a vector field, Line integrals, Line integrals independent of path, Green's theorem in the plane (without proof), Surface integrals, Triple integrals, Divergence theorem of Gauss (without proof), Applications to Engineering problems, Stokes theorem(without proof).

Text Books :	1. "Advanced Engineering Mathematics", Erwin Kreyszig, 9th edition, John Wiley & Sons.
References :	1. "Advanced Engineering Mathematics", Peter V. O'Neil, Thomsons Brooks/Cole.

Course Outcome, Program Objectives & Program Specific Objectives Mapping															
	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14MA201.1	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
14MA201.2	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
14MA201.3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
14MA201.4	3	1	-	1	-	-	-	-	-	-	-	-	2	-	-

ENGINEERING PHYSICS – II

I B.Tech – II Semester (Code: 14PH202)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14PH202.1	Students demonstrate the ability to apply the knowledge of band theory of solids and concept of energy band gap and hole
14PH202.2	Classify the different types of magnetic and dielectric materials and their applications
14PH202.3	Understand importance of Nano materials, properties and their applications.
14PH202.4	To familiarize the phenomenon of superconductivity and opto-electronic devices.
14PH202.5	Students to understand the principle in the production and applications of ultrasonic
14PH202.6	Students are able to estimate the crystal structures by x-ray diffraction technique.

UNIT-1 (13Periods)

Electron theory of solids & semiconductor physics:

Electron theory of solids: Failure of classical free electron theory, quantum free electron theory, Fermi-Dirac distribution and its temperature dependence, Kronig-Penny model (Qualitative), effective mass of electron, concepts of energy band gap and hole.

Semiconductor physics: Classification of semiconductors, density of states, carrier concentration in intrinsic and extrinsic semiconductors, law of mass action, conductivity in semiconductors (drift and diffusion), Equation of continuity, P-N junction diode and its V-I characteristics.

UNIT-2 (12Periods)

Magnetic, Dielectric and Ferro-electric materials:

Origin of magnetic moment of an atom, Bohr magneton, Domain theory of Ferro magnetism, curie-weisslaw(Qualitative), Hysteresis curve, soft and hard magnetic materials, ferrites and its applications.

Dielectric materials: Types of polarizations, internal field (qualitative), Classius – Mossotti equation, Frequency dependence of polarization, Ferroelectrics and its applications, strength of dielectrics and dielectric breakdown.

UNIT-3 (13Periods)

Advanced materials:

Nano-materials: Introduction to nano-materials, surface to volume ratio, quantum confinement, properties of nano materials, Fabrication of nano-materials (CVD and sol-gel methods), carbon nano tubes and its properties, Applications of nano materials.

Superconductivity: Critical temperature, critical magnetic field and critical current. Meissner effect, type-I and type-II superconductors, attractive interactions, qualitative treatment of BCS theory and, Josephson's junction, Applications of superconductors.

Opto-electronic devices: Working and applications of solar cell, LED, LCD, Photo Diode.

UNIT-4	(12Periods)

Analytical techniques:

Nuclear techniques: Radio isotopes and its applications (Medical and Industrial), GM-counter, scintillation counter.

Ultrasonics: Properties of ultrasonics, General applications of ultrasonics.

Medical applications: Cardiology and Ultrasonic imaging.

Industral applications: NDT (Pulse echo technique) and cavitation effect. Time of flight diffraction technique.

Structure determination: Crystal lattices (Bravais), and planes, Miller indices, Bragg's law, structural analysis of crystals using X-Ray powder diffraction method.

Text Books :	1. "A Text Book of Engineering Physics", M.N.Avadhanulu& P. Krushisagar, S.Chand Publication., (Edition – 2013).
References :	1. "Engineering physics"byR.K.Gour and S.L.Gupta. Dhanpatrai publications. 2. "Basic Engineering Physics" by P.Srinivasarao&K.Muralidhar,Himalaya publications. 3. "Engineering physics" by M.R.Sreenivasan. New age international publications. 4. "Engineering physics" by Palaniswamy. Scitech publications.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14PH202.1	3	-	3	-	-	-	-	-	-	-	-	3	-	-	-
14PH202.2	3	-	3	-	2	2	-	-	-	-	-	3	-	-	-
14PH202.3	3	-	3	-	2	2	-	-	-	-	-	2	-	-	-
14PH202.4	3	-	3	3	3	2	3	-	-	-	-	3	-	-	-
14PH202.5	3	-	3	3	3	3	-	-	-	-	-	2	-	-	-
14PH202.6	3	2	3	3	3	2	-	-	-	-	-	3	-	-	-

ENGINEERING CHEMISTRY – II

I B.Tech – II Semester (Code: 14CY203)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CY203.1	Design economically new synthetic methods of polymers, their usages, and substitute metals with Cheaper, durable & light weight polymer materials.
14CY203.2	Have the capacity of applying energy sources efficiently and economically for various needs with knowledge of construction of energy devices.
14CY203.3	Understand corrosion methods and able to develop methods to prevent corrosion of metals and also to protect the environment by designing safer chemical techniques
14CY203.4	Apply their knowledge in analyzing the structure of organic compounds and estimations of elements in various samples by using different instrumental techniques

UNIT-1 (12Periods)

Polymers:

Introduction, polymerization: types – addition and condensation polymerization; Mechanism of free radical addition polymerization with suitable example; Polymer Tacticity and Ziegler Natta polymerization (mechanism).

Plastics: Classification (Thermoplastic and thermosetting); Preparation, properties and uses of PVC, Teflon, Bakelite, Nylon-6,6.

Rubbers: Natural rubber**,** drawbacks of raw rubber**,** Vulcanization of rubber; Synthetic rubbers: Buna-S, Buna-N and Poly urethane.

UNIT-2 (13Periods)

Electro Chemistry

Electrode potential, Determination of single electrode potential; Nernst equation (problems); Electrochemical series – significance; Electro chemical cells, Reversible and irreversible cells, Reference electrodes – Standard Hydrogen electrode, Calomel electrode, Ion selective electrode (glass electrode) – measurement of pH;

Solar cells: Introduction, Solar Panels, Applications;

Fuel Cells: Hydrogen – Oxygen Fuel Cell;

Batteries: Lead – acid, NiCad and Lithium Batteries.

UNIT-3 (13Periods)

Corrosion and Corrosion Control

Corrosion: Types of corrosion - Chemical or dry corrosion, Pilling – Bedworth rule; Electrochemical or wet corrosion; Galvanic corrosion, pitting, stress and differential aeration corrosion; factors influencing corrosion;

Corrosion control – sacrificial anodic method and impressed current cathodic methods, corrosion inhibitors; Protective coatings: Metallic coatings – electro plating (Au) and electroless plating (Ni). Paints – constituents and functions,

Green Chemistry: Principles and applications of green chemistry, Integrated Waste Management (IWM), Zero Waste Technologies (ZWT), green auditing, green solvents, green catalysts, green energies.

UNIT-4	(12Periods)

Analytical Techniques

Beer-Lambert's law; **Colorimetry**: principle, instrumentation (with block diagram) and Estimation of iron, **Flame photometry**: principle, instrumentation (with block diagram) and estimation of sodium; **A**tomic **A**bsorption **S**pectroscopy: principle, instrumentation (with block diagram) and estimation of nickel.

Conductometric titrations (Acid-Base) and Potentiometric titrations (Redox titrations – Fe^{2+}*vs*dichromate).

Text Books :	1. C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 15th edition (2010).
References :	1. S.S. Dara&Mukkanti K. "A text book of engineering chemistry" S. Chand & Co. Ltd., New Delhi (2006). 2. B. Sivasankar "Engineering Chemistry" Tata McGraw Hills co., New Delhi (2008). 3. Dr. B. K. Sharma, Instrumental methods of analysis, Krishna Prakashan Media, 2000.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CY203.1	2	2	2								2		2		2
14CY203.2	3	3									3		3		
14CY203.3			3	3									3		3
14CY203.4	2	2	2	2									2		2

COMMUNICATIVE ENGLISH I B.Tech – II Semester (Code: 14EL204/14EL104)					
Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14EL204.1	At enhancing the vocabulary competency of the students
14EL204.2	To enhance the understanding of the elements of grammar
14EL204.3	To enable the students to use proper spelling, grammar in constructing the sentences
14EL204.4	To enhance the learner's ability to communicate accurately

UNIT-1 (13Periods)

a. **Text: Unit-I** Going Places: Travel
   Unit-II Reaching Out: Mass Media
b. **Grammar:** Review of Parts of Speech, Concord
c. **Writing:** Mind Mapping, Paragraph Writing: Structure, Development & Types
d. Vocabulary from the suggested units (Given List)

UNIT-2 (12Periods)

a. **Text: Unit-III** Ushering in a New Era: Networking
   Unit-IV Inspiring Minds: Successful People
b. **Grammar:**Tenses, Conditionals
c. **Writing:**Essay Writing: Descriptive, Argumentative, Imaginative, Narrative
d. **Vocabulary** from the suggested units (Given List)

UNIT-3 (13Periods)

a. **Text: Unit-V** Morphed Universe**:** Technology as a double Edged Sword
   Unit-VI The Indomitable Human Spirit: Facing Disasters
b. **Grammar:** Articles, Reported Speech, Voices
c. **Writing:** Letter Writing (Inquiry, Complaint & Request Letters) & Summarizing
d. **Vocabulary** from the suggested units (Given List)

UNIT-4 (12Periods)

a. **Text: Unit-VII** Getting Job Ready: Interview Skills
   Unit-VIII The World of Work: The Corporate Experience
b. **Grammar:** Common Errors
c. **Writing:** Note Making, Technical Report Writing
d. **Vocabulary** from the suggested unit (Given List)

Text Books :	1. Dr. Elango, Dr. VeenaSelvam, Dr. PriyadarshiniSujatha (2013): Resonance: English for Engineers and Technologists, CUP.
References :	1. Michael Swan (2003): Practical English Usage, CUP.

	2. Stephen, McLaren (2003): Easy Writer Student's Guide to Writing Essays and Reports, New Delhi, Viva Books Pvt. 3. Raymond Murphy (2012): English Grammar in Use (Fourth Edition), CUP. 4. LinaMukhopadhyay (2013): English for Jobseekers, CUP. 5. R.C Sharma (2010): Business Correspondence and Report writing (Fourth Edition), Tata McGraw Hill.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14EL204.1	3	3	3	3						3			3		3
14EL204.2	2	2					2	2				2		2	
14EL204.3	2		2	2				2				2	2		2
14EL204.4	3	3	3	3		3	3	3				3	3		

ENGINEERING MECHANICS

I B.Tech – II Semester (Code: 14EM205/14EM105)

Lectures	:	4 Periods/Week, Tutorial 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14EM205.1	Construct free body diagrams and use appropriate equilibrium equations, Calculate unknown forces in a plane by resolution of force and equilibrium equations.
14EM205.2	Locate Centroid of composite figures and determine moment of plane figures Analyze the systems with friction.
14EM205.3	Determine the axial forces in the members of determinate truss. Calculation of acceleration, velocity and displacement and forces.
14EM205.4	Determine moment of inertia of material bodies, Calculation of angular displacement, velocity and angular acceleration of rotational bodies.

UNIT-1 (16 Periods)

Concurrent Forces in a Plane

Principles of statics – Composition and resolution of forces – Equilibrium of concurrent forces in a plane –Method of moments.

Parallel Forces in a Plane

Two parallel forces – General case of parallel forces in a plane – Center of parallel forces – Centroids of composite plane figures and curves.

UNIT-2 (15 Periods)

Moments of Inertia of Plane Figures

Moment of inertia of a plane figure with respect to an axis in its plane – Moment of Inertia with respect to an axis perpendicular to the plane of the figure – Parallel axis theorem

General Case of Forces in a Plane

Composition of forces in a plane – Equilibrium of forces in a plane – Plane trusses: method of joints.

UNIT-3 (15 Periods)

Friction

Characteristics of friction – problems involving dry friction.

Rectilinear Translation

Kinematics of rectilinear motion – principles of dynamics – Differential equations of rectilinear motion D'Alemberts principle – momentum and impulse – work and energy – ideal systems: conservation of energy.

UNIT-4 (14 Periods)

Curvilinear Translation

Kinematics of curvilinear motion – Differential equations of curvilinear motion – D'Alembert's principle – Work and Energy.

Moments of Inertia of Material Bodies

Moment of inertia of a rigid body – Moment of inertia of a lamina – Moments of inertia of three – dimensional bodies.

Rotation of a Rigid Body about a Fixed Axis

Kinematics of rotation – Equation of motion for a rigid body rotating about a fixed axis – D'Alembert's principle

Text Books :	1. Engineering mechanics by S. Timoshenko and D. H. Young – McGraw-Hill International edition (For concepts and symbolic problems) 2. Engineering mechanics statics and dynamics by A. K. Tayal – Umesh publication, Delhi (For numerical problems using S.I. system of units
References :	1. Vector mechanics for engineer's statics and dynamics by Beer and Johnston, Tata McGraw-Hill publishing company, New Delhi 2. Engineering mechanics statics and dynamics by R. C. Hibbeler and Ashok Gupta – Pearson (For numerical problems using S.I. system of units)

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14EM205.1	3					3	3	3		3		3	3		3
14EM205.2	2						2			2		2	2		
14EM205.3	2		2					2	2	2		2			
14EM205.4	2			2					2	2					

PROBLEM SOLVING WITH PROGRAMMING

I B.Tech – II Semester (Code: 14CP206/14CP106)

Lectures	:	4 Periods/Week, SelfStudy 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CP206.1	Choose the right data representation formats based on the requirements of the problem
14CP206.2	Analyze a given problem and delop an algorithm to slove the problem
14CP206.3	Use the comparision and limatiotions of the various programming construct and choose the right one forthe task in hand
14CP206.4	Write the program on a computer,edit,compile,debug,correct,recompile and run it

UNIT-1 (16 Periods)

Basics and Introduction to C, The C Declarations, Operators and Expressions,Input and Output in C, Decision Statements.

Programming Exercises for Unit I:C-expressions for algebraic expressions, evaluation of arithmetic and Boolean expressions. Syntactic errors in a given program, output of a given program, values of variables at the end of execution of a program fragment, filling the blanks in a given program. Programs using Scientific and Engineering formulae. Finding the largest of the three given numbers. Computation of discount amount on different types of products with different discount percentages. Finding the class of an input character, finding the type of triangle formed with the given sides, computation of income-tax, computation of electricity bill and conversion of lower case character to its upper case.

UNIT-2 (15 Periods)

Loop Control, Data Structure: Array,

Programming Exercises for Unit – II: To print the sum of the digits of a given number and to display the image of a given number. To find whether a given number is prime, printing Fibonacci sequence and to find prime factors of a given number. To print graphic patterns of symbols and numbers and computation of statistical parameters of a given list of numbers. To find the length of a string, compare strings, reverse a string, copy a string and to find whether the given string is palindrome or not. Transpose of a matrix, product and sum of matrices and sorting of names using arrays.

UNIT-3 (15 Periods)

Strings and Standard Functions,Pointers,Dynamic Memory Allocation and Linked List:Dynamic Memory Allocation, Memory Models, Memory Allocation Functions.

Functions, Storage Class.

Programming Exercises for Unit - III: Functions - Insertion sort, Linear search. Recursive functions to find factorial & GCD (Greatest Common Divisor), string operations using pointers and pointer arithmetic and dynamic memory allocation. Swapping two variable values. Sorting a list of names using array of pointers.

UNIT-4	(14 Periods)
Preprocessor Directives:Introduction, The #define Directive, Undefining a Macro, Token Pasting and Stringing Operators, The #include Directive, Conditional Compilation, The #ifndef Directive, Structure and Union, Files. **Programming Exercises for Unit – IV**:Operations on complex numbers, matrix operations with the matrix and the size of the matrix as a structure, sorting a list of student records on register number using array of pointers and to read an input file of marks and generate a result file, sorting a list of names using command line arguments.	
Text Books :	1. Ashok N.Kamthane, "Programming in C", PEARSON 2nd Edition
References :	1. Kernighan BW and Dennis Ritchie M, "C programming language", 2nded, Prentice Hall. 2. Yashavant P. Kanetkar, "Let us C", BPB Publications. 3. E.Balagurusamy, "Programming in ANSI C", 4thed, Tata Mcgraw-Hill. 4. Herbert Schildt, "C: The Complete Reference", 4th edition, Tata Mcgraw-Hill.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CP206.1	3	3	3	2	2	2	-	-	-	-	-	-		1	
14CP206.2	3	3	3	2	3	2	-	-	-	-	-	-		1	
14CP206.3	3	3	3	2	3	2	-	-	-	-	-	-		1	
14CP206.4	2	2	2	2	2	2	-	-	-	-	-	-		1	

PHYSICS LABORATORY

I B.Tech – II Semester (Code: 14PHL201/14PHL101)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14PHL201.1	Students demonstrate the ability to apply the knowledge of band theory of solids and concept of energy band gap and hole
14PHL201.2	Classify the different types of magnetic and dielectric materials and their applications
14PHL201.3	Understand importance of Nano materials, properties and their applications.
14PHL201.4	To familiarize the phenomenon of superconductivity and opto-electronic devices.

LIST OF EXPERIMENTS

1. Determination of acceleration due to gravity at a place using compound pendulum.
2. Study the variation of intensity of magnetic field along the axis of a circular coil using Stewart-Gee's apparatus.
3. Determination of thickness of thin wire using air wedge interference bands.
4. Determination of radius of curvature of a Plano convex lens by forming Newton's rings.
5. Determination of wavelengths of mercury spectrum using grating normal incidence method.
6. Determination of dispersive power of a given material of prism using prism minimum deviation method.
7. Draw the resonant characteristic curves of L.C.R. series circuit and calculate the resonant frequency.
8. Draw the characteristic curves of a photocell and calculate the maximum velocity of electron.
9. Verify the laws of transverse vibration of stretched string using sonometer.
10. Determine the rigidity modulus of the given material of the wire using Torsional pendulum.
11. Draw the load characteristic curves of a solar cell.
12. Determination of Hall coefficient of a semiconductor.
13. Determination of voltage and frequency of an A.C. signal using C.R.O.
14. Determination of Forbidden energy gap of Si &Ge.
15. Determination of wavelength of laser source using Diode laser.

Text Books :	1. "Engineering physics laboratory manual", P.Srinivasarao&K.Muralidhar, Himalaya publications.
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3

14PHL201.1	3	-	3	-	-	-	-	-	-	-	-	3	-	-	-
14PHL201.2	3	-	3	-	2	2	-	-	-	-	-	3	-	-	-
14PHL201.3	3	-	3	-	2	2	-	-	-	-	-	2	-	-	-
14PHL201.4	3	-	3	3	3	2	3	-	-	-	-	3	-	-	-

HARDWARE LABORATORY

(Common for all branches)

I B.Tech – I Semester (Code: 14HWL202/14HWL102)

Practicals	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14HWL202.1	Differentiate and identify various electronic components.
14HWL202.2	Elaborate functionality of Oscilloscope, Function generator, Power supply and Multi meter.
14HWL202.3	Understand working of Ceiling fan, Lamp, Transformer,
14HWL202.4	Identify all parts of a computer, assembling a computer, installation of system and application software.

LIST OF EXPERIMENTS

1. Identification and testing of various electronic components. (Resistors, Inductor, Capacitor, Transistor, ICs and Bread board)
2. Study of Oscilloscope, Function generator, Power supply and Multi meter.
3. KCL & KVL verification for simple circuits on Bread board.
4. Study of Ceiling fan.
5. Study of Florescent lamp.
6. Study of Single Phase Transformer.
7. Identifying all parts of computers.
8. Install and Uninstall system and application software.
9. Assembling a Computer.
10. Connecting computers in a network.

Text Books :	
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14HWL202.1	2	2	2				2		2	2	2		2		
14HWL202.2	2	2	2	2							2			2	2
14HWL202.3	2	2	2			2			2						2
14HWL202.4	3	3	3	3				3	3			3	3		3

PROBLEM SOLVING WITH PROGRAMMING LABORATORY

I B.Tech – II Semester (Code: 14CPL203/14CPL103)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CPL203.1	Choose the right data representation formats based on the requirements of the problem
14CPL203.2	Analyze a given problem and delop an algorithm to slove the problem
14CPL203.3	Use the comparision and limatiotions of the various programming construct and choose the right one forthe task in hand
14CPL203.4	Write the program on a computer,edit,compile,debug,correct,recompile and run it

LIST OF EXPERIMENTS

1. A program for electricity bill taking different categories of users, different slabs in each category. (Using nested if else statement).

Domestic Customer:		
Consumption Units	**Rate of Charges(Rs.)**	
0 – 200	0.50 per unit	
201 – 400	100 plus	0.65 per unit
401 – 600	230 plus	0.80 per unit
601 and above	390 plus	1.00 per unit
Commercial Customer:		
Consumption Units	**Rate of Charges(Rs.)**	
0 – 50	0.50 per unit	
100 – 200	50 plus	0.60 per unit
201 – 300	100 plus	0.70 per unit
301 and above	200 plus	1.00 per unit

2. Write a C program to evaluate the following (using loops):
   a) $1 + x^2/2! + x^4 / 4!+$ …upto ten terms
   b) $x + x^3/3! + x^5/5!+$ … upto 7 digit accuracy
3. Write a C program to check whether the given number is
   a) Prime or not.
   b) Perfect or Abundant or Deficient.
4. Write a C program to display statistical parameters (using one – dimensional array).
   a) Mean
   b) Mode

c) Median
d) Variance.

5. Write a C program to read a list of numbers and perform the following operations
   a) Print the list.
   b) Delete duplicates from the list.
   c) Reverse the list.
6. Write a C program to read a list of numbers and search for a given number using Binary search algorithm and if found display its index otherwise display the message "Element not found in the List".
7. Write a C program to read two matrices and compute their sum and product.
8. A menu driven program with options (using array of character pointers).
   a) To insert a student name
   b) To delete astudent name
   c) To print the names of students
9. Write a C program to read list of student names and perform the following operations
   a) To print the list of names.
   b) To sort them in ascending order.
   c) To print the list after sorting.
10. Write a C program that consists of recursive functions to
    a) Find factorial of a given number
    b) Solve towers of Hanoi with three towers (A, B & C) and three disks initially on tower A.
11. A Bookshop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book the sales person inputs the title and the author, and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed, if it is, then the system displays the book details and request for the number of copies required, if the requested copies are available the total cost of the requested copies is displayed otherwise the message "required copies not in stock" is displayed. Write a program for the above in structures with suitable functions.
12. Write a C program to read a data file of students' records with fields(Regno, Name, M1,M2,M3,M4,M5) and write the successful students data (percentage > 40%) to a data file.

Text Books :	Ashok N.Kamthane, "Programming in C", PEARSON 2nd Edition
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CPL203.1	3	3	3	2	2	2	-	-	-	-	-	-		1	
14CPL203.2	3	3	3	2		2	-	-	-	-	-	-		1	
14CPL203.3	3		3		3	2	-	-	-	-	-	-		1	
14CPL203.4	2	2	2	2	2	2	-	-	-	-	-	-		1	

ENGINEERING MATHEMATICS – III

II B.Tech – III Semester (Code: 14MA301)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Elementary integral calculus, Ordinary linear differential equations and Fourier series, Elementary calculus.

Course Outcomes: Students will be able to:

14MA301.1	Evaluation of Fourier integrals, Fourier Transforms of simple, more general functions and its derivatives using properties of transforms, Convolution.
14MA301.2	Various methods to solve partial differential equations with initial and boundary conditions to find a general solution of one dimensional heat and wave equations, two dimensional Laplace's equation.
14MA301.3	Scientific computing techniques to overcome common computational difficulties in engineering applications involving interpolation, numerical integration.
14MA301.4	Applying numerical methods to find a particular solution of an initial value problem for ordinary differential equations and partial differential equations.

UNIT-1 (13 Periods)

Fourier integrals: From Fourier series to the Fourier integral, Application of the Fourier integral, Fourier Cosine and Sine integral, Evaluation of integrals, Fourier cosine and sine Transforms: Fourier Cosine Transforms, Fourier Sine Transforms, Linearity, Transforms of Derivatives, Fourier Transform: Complex form of the Fourier integral, Fourier Transform and its inverse, Linearity. Fourier Transform of Derivatives, Convolution.

UNIT-2 (13 Periods)

Partial differential equations: Basic concepts, Modelling-Vibrating string, Wave Equation Separation of Variables Use of Fourier series, D'Alembert's Solution of the Wave Equation, Heat Equation-Solution Fourier series, Steady-State Two-Dimensional Heat Flow.

UNIT-3 (12 Periods)

Numerical Methods in general: Introduction, Solution of Equations by Iteration, newton's Method for Solving Equations f(x) = 0, Convergence of Newton's method, Interpolation: Lagrange interpolation, Newton's divided difference interpolation, Equal spacing: Newton's forward Difference formula, Newton's Backward Difference formula, Inverse interpolation, Numerical integration and Differentiation: Trapezoidal Rule, Error Bounds and Estimate for the Trapezoidal Rule, Simpson's Rule of integration, Error of Simpson's rule.

UNIT-4 (12 Periods)

Numerical methods in linear algebra: Linear Systems: Gauss Elimination, LU Factorization, Gauss-Seidel iteration Method, Method of least Squares, Methods of First order Differential Equations: Euler's method, Runge-Kutta methods, Methods for Elliptic Partial Differential Equations: Laplace equation, Poisson equation.

Text Books :	1. "Advanced Engineering Mathematics", Erwin Kreyszig, 9th edition, John Wiley & Sons.
References :	1. "Advanced Engineering Mathematics", Peter V. O'Neil, Thomson's Brooks/Cole.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14MA301.1	3	2	-	1	-	-	-	-	-	-	-	-	2	-	-
14MA301.2	3	2	-	1	-	-	-	-	-	-	-	-	1	-	-
14MA301.3	3	2	-	1	-	-	-	-	-	-	-	-	2	-	-
14MA301.4	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-

DISCRETE MATHEMATICAL STRUCTURES II B.Tech –III Semester (Code:14CS302)					
Lectures	:	4Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Engineering Mathematics (14MA101, 14MA201)

Course Outcomes: Students will be able to:

14CS302.1	Understand operations on discrete structures such as sets, functions, relations, and Sequences. Formulate short proofs using the following methods: direct proof, indirect proof, and proof by contradiction, and case analysis etc. Apply algorithms and use definitions to solve problems to prove statements in elementary number theory. Construct mathematical arguments using logical connectives and quantifiers. Verify the correctness of an argument using propositional and predicate logic and truth tables.
14CS302.2	Understand to solve problems using counting techniques and combinatory in the context of discrete probability.
14CS302.3	Understand problems on involving recurrence relations and generating functions. And Know the properties of equivalence relations and partial orderings.
14CS302.4	Understand basic definitions and properties associated with simple planar graphs, including isomorphism, connectivity, and Euler's formula, and describe the difference between Eulerian and Hamiltonian graphs. Use graphs and trees as tools to visualize and simplify situations.

UNIT-1	(16 Periods)

Foundations: Sets, Relations and Functions, Fundamentals of Logic, Logical Inferences, Methods of Proof of an implication, First order Logic & Other methods of proof, Rules of Inference for Quantified propositions, Mathematical Induction.

UNIT-2	(15 Periods)

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with repetitions, Enumerating Permutation with Constrained repetitions. Recurrence relations: Generating functions of sequences, Calculating Coefficients of Generating Functions.

UNIT-3	(14 Periods)

Recurrence Relations: Solving recurrence relations by Substitution and generating functions. The methods of characteristic roots, solutions of inhomogeneous recurrence relations.

Relations and digraphs: Special properties of binary relations, Operations on relation.

UNIT-4	(14 Periods)

Ordering relations, Lattice, Paths and Closures, Directed Graphs and Adjacency Matrices, Application: Topological Sorting.

Graphs: Basic Concepts, Isomorphisms and Subgraphs, Planar Graphs, Euler's Formula; Multigraphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four Color Problem.	
Text Books :	1. Toe L.Mott, Abraham Kandel& Theodore P.Baker, "Discrete Mathematics for Computer Scientists & Mathematicians", PHI 2nd edition.
References :	1. C.L. Liu, "Elements of Discrete Mathematics". 2. Rosen, "Discrete Mathematics".

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS302.1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS302.2	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS302.3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS302.4	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-

DIGITAL LOGIC DESIGN

II B.Tech – III Semester (Code: 14CS303)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Boolean algebra and Number system fundamentals.

Course Outcomes: Students will be able to:

14CS303.1	Understand basic arithmetic operations in different number systems and simplification of Boolean functions using Boolean algebra and K-Maps.
14CS303.2	Simplify Boolean functions using Tabulation method, Concepts of combinational logic circuits.
14CS303.3	Understand the concepts of Flip-Flops, Analysis of sequential circuits.
14CS303.4	Understand the concepts of Registers, Counters and classification of Memory units.

UNIT-1 (13 Periods)

Review of Number systems & codes, Representation of integers and Floating point numbers, Accuracy, Introduction to integer arithmetic operations.

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 operations, Digital Logic Gates.

SIMPLIFICATION OF BOOLEAN FUNCTIONS: The Map Method, Two and three variable Maps, Four-variable Map, Five and six-variable Maps, Product of Sums Simplification, NAND and NOR implementation, Don't-Care conditions.

UNIT-2 (13 Periods)

SIMPLIFICATION OF BOOLEAN FUNCTIONS: The Tabulation Method, Determination of Prime Implicants, Selection of Prime-Implicants.

COMBINATIONAL LOGIC: Design Procedure, Adders, Subtractors, Code conversion, Analysis procedure.

COMBINATIONAL LOGIC WITH MSI AND LSI: Binary parallel adder, Decimal adder, Magnitude comparator, Decoders, Multiplexers.

UNIT-3 (12 Periods)

SEQUENTIAL LOGIC: Flip Flops, Triggering of Flip-Flops, Synthesis and Analysis of Clocked Sequential Circuits, State tables and State diagrams, State Reduction and assignment, Flip-Flop Excitation tables, Design Procedure, Design of counters, Design with state equations.

UNIT-4 (12 Periods)

REGISTERS, COUNTERS: Registers, Shift registers, Ripple counters, Synchronous counters, Timing sequences.

MEMORIES: Classification of ROMs, EPROMs, EEPROMs, RAMs.

PROGRAMMABLE LOGIC: Read only memory (ROM), Programmable logic device (PLD), and Programmable logic array (PLA), and Programmable array logic (PAL).

Text Books :	1. Morris Mano, “Computer Engineering Hardware Design”, PHI. 2. A.Anandkumar, “Fundamentals of digital circuits”, 4th edition, PHI.
References :	1. R.P.Jain, “Modern digital electronics”, 3rd edition, TMH 2. Donald e Givone, “Digital Principles and Design”, TMH.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS303.1	3	3	-	3	2	-	-	-	-	-	-	-	-	2	1
14CS303.2	2	2	-	2	2	-	-	-	-	-	-	-	2	2	2
14CS303.3	1	3	2	-	-	-	2	-	-	-	-	-	2	-	2
14CS303.4	1	2	1	-	-	-	2	-	-	-	-	-	1	-	2

OPERATING SYSTEMS

II B.Tech – III Semester (Code: 14CS304)

Lectures	:	4 Periods/Week, Self-Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving with Programming (14CP206)

Course Outcomes: Students will be able to:

14CS304.1	Understand different structures, services of the operating system and the use of scheduling and operations on process.
14CS304.2	Understand the use of scheduling, operations on process, the process scheduling algorithms and synchronization concepts.
14CS304.3	Understand the concepts of deadlock, memory and virtual memory management techniques.
14CS304.4	Understand the concepts of File System, Input/output systems and system protection of various operating systems.

UNIT-1 (16 Periods)

Introduction: What OSs Do? OS Structure, OS Operations, Process Management, Memory Management, Storage Management, Protection and Security.

System Structures: OS Services, System Calls, Types of System Calls, System Programs, OS Design and Implementation, OS Structure.

Process-Concept: Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication.

Multithreaded Programming: Overview, Multithreading Models.

UNIT-2 (15 Periods)

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms.

Synchronization: Background, Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic problems of Synchronization, Monitors.

UNIT-3 (15 Periods)

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Avoidance, Detection and Recovery.

Memory-Management Strategies: Background, Swapping, Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation.

Virtual-Memory Management: Background, Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Other Considerations.

UNIT-4 (14 Periods)

File System: File concept, Access Methods, Directory and Disk Structure, File Sharing-Multiple Users, Remote File Systems, The Client-Server Model, Distributed Information Systems.

I/O Systems: Overview, Application I/O Interface.

System Protection: Goals of Protection, Principles of Protection, Domain of Protection-Domain Structure, Access Matrix, Implementation of Access Matrix.

Text Books :	1. Silberschatz & Galvin, “Operating System Concepts”, 8th edition, John Wiley & Sons (Asia) Pvt.Ltd.,.
References :	1. William Stallings, “Operating Systems – Internals and Design Principles”, 5/e, Pearson. 2. Charles Crowley, “Operating Systems: A Design-Oriented Approach”, Tata McGraw Hill Co., 1998 edition. 3. Andrew S.Tanenbaum, “Modern Operating Systems”, 2nd edition, 1995, PHI

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS304.1	-	-	-	-	-	-	-	-	-	-	-	2	3	-	-
14CS304.2	3	3	3	3	-	-	-	-	-	-	-	2	3	3	3
14CS304.3	3	3	3	3	-	-	-	-	-	-	-	2	3	3	3
14CS304.4	-	-	3	1	-	-	-	-	-	-	-	3	3	1	3

DATA STRUCTURES

II B.Tech – III Semester (Code: 14CS305)

Lectures	:	4Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving with Programming (14CP206)

Course Outcomes: Students will be able to:

14CS305.1	Understand and program basic data structures like arrays and linked lists with their applications. Understand concepts of Algorithm complexities.
14CS305.2	Understand and Program data structures like stacks and queues with their applications. Understand and implement sorting algorithms.
14CS305.3	Understand and program on trees, binary trees, binary search trees, AVL trees, expression trees and their traversal methods, including algorithm complexities.
14CS305.4	Understand and program on priority queues, hashing and their mechanisms. Basic knowledge of graphs representations and traversing methods.

UNIT-1 (16 Periods)

Algorithm Analysis: Mathematical Back Ground, Model, what to Analyze, Running Time Calculations.

Lists: Abstract Data Types, The List ADT, Singly Linked List ADT, Doubly Linked List ADT, Circular Linked List ADT, Polynomial ADT: addition, multiplication operations.

UNIT-2 (15 Periods)

Stacks and Queues: The Stack ADT and its applications such as Infix to Postfix expression conversions, Evaluation of Postfix expressions. The Queue ADT, Queue Application-Radix sort.

Sorting Preliminaries: Shell sort, Merge sort, Quicksort.

UNIT-3 (15 Periods)

Trees: Preliminaries, Binary Trees, Expression trees, The Search Tree ADT, Binary Search Trees, Implementation. AVL Trees, Single Rotations, Double rotations, Implementations.

UNIT-4 (14 Periods)

Hashing: General Idea, Hash Function, Separate Chaining, Open Addressing, Linear Probing, Priority Queues (Heaps), Model, Simple implementations, Binary Heap, Heap Sort.

Graphs: Definitions, Representations: Adjacency matrices and lists, Graph traversals: Depth first, Breadth first.

Text Books :

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education.

References :

1. Y.Langsam, M.J.Augeustein and A.M.Tenenbaum, "Data Structures Using C", Pearson Education Asia, 2004.
2. Richard F.Gilberg, Behrouz A. Forouzan, "Data Structures – A Pseudocode Approach with C", ThomsonBrooks / COLE, 1998.
3. Aho, J.E. Hopcroft and J.D. Ullman, "Data Structures and Algorithms",

	Pearson Education Asia, 1983.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS305.1	3	2	-	2	-	-	-	-	-	-	-	2	2	3	-
14CS305.2	2	3	-	2	-	-	-	-	-	-	-	-	3	2	-
14CS305.3	3	-	-	2	-	-	-	-	-	-	-	2	2	3	-
14CS305.4	3	-	3	2	2	-	-	-	-	-	-	2	2	3	2

OBJECT ORIENTED PROGRAMMING

II B.Tech – III Semester (Code: 14CS306)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving with Programming (14CP206)

Course Outcomes: Students will be able to:

14CS306.1	Understand advantages of OO programming over procedural oriented programming, learn the basics of variables, operators, control statements, arrays, strings, classes and objects.
14CS306.2	Understand, write and implement Operator Overloading, Indexers, Properties, Inheritance, Interfaces, Structures, and Enumerations.
14CS306.3	Understand and write programs on Exception Handling, I/O, Delegates and Events.
14CS306.4	Understand Namespaces, the Preprocessor, Assemblies, Generics, Collections, Enumerators, and Iterators.

UNIT-1 (13 Periods)

The Creation of C#: C#'s Family Tree, The Creation of C#, What Is the .NET Framework? Managed vs. Unmanaged Code.

An Overview of C#: The C# Keywords, Identifiers, A First Simple Program

Data Types, Literals, and Variables: C#'s Value Types, Some Output Options, Literals, A Closer Look at Variables, The Scope and Lifetime of Variables, Type Conversion and Casting,

Operators: Arithmetic Operators, Relational and Logical Operators, The Assignment Operator, The Bitwise Operators, The? Operator, Operator Precedence

Program Control Statements Arrays and Strings:

The if Statement, the switch Statement, the for Loop, the while Loop, the do-while Loop, using break, using continue.

Introducing Classes and Objects: Class Fundamentals, How Objects Are Created, Reference Variables and Assignment, Methods, Constructors, the new Operator Revisited, Garbage Collection and Destructors. This Keyword.

Arrays and Strings: Arrays, Multidimensional Arrays, Jagged Arrays, Assigning Array References, Using the Length Property, Implicitly Typed Arrays, The foreach Loop, Strings,

A Closer Look at Methods and Classes:

Controlling Access to Class Members, Pass References to Methods, Use ref and out Parameters, Use a Variable Number of Arguments, Return Objects, Method Overloading, Overload Constructors, Object Initializers, Optional Arguments, Named Arguments, The Main( ) Method, Recursion, Understanding static, Static Classes.

UNIT-2 (13 Periods)

Operator Overloading: Operator Overloading Fundamentals, Handling Operations on C# Built-in Types, Overloading the Relational Operators, Overloading true and false, Overloading the Logical Operators, Conversion Operators, Operator Overloading Tips and Restrictions, Indexers and Properties: Properties, Use Access Modifiers with Accessors.

Inheritance: Inheritance Basics, Member Access and Inheritance, Constructors and Inheritance, Inheritance and Name Hiding, Creating a Multilevel Hierarchy, When Are

Constructors Called?, Base Class References and Derived Objects, Virtual Methods and Overriding, Applying Virtual Methods, Using Abstract Classes, Using sealed to Prevent Inheritance, Boxing and Unboxing, Is object a Universal Data Type?.
Interfaces, Structures, and Enumerations: Interfaces, Implementing Interfaces, Using Interface References, Interfaces Can Be Inherited, Name Hiding with Interface Inheritance, Explicit Implementations, Choosing Between an Interface and an Abstract Class, Structures, Why Structures?, Enumerations, Initialize an Enumeration, Use Enumerations.

UNIT-3	(12 Periods)

Exception Handling: The System.Exception Class, Exception-Handling Fundamentals, A Simple Exception Example, The Consequences of an Uncaught Exception, Exceptions Let You Handle Errors Gracefully, Using Multiple catch Clauses, Catching All Exceptions, Nesting try Blocks, Throwing an Exception, Rethrowing an Exception, Using 'finally', A Closer Look at the 'Exception' Class, Catching Derived Class Exceptions, Using checked and unchecked.
Using I/O: C#'s I/O Is Built Upon Streams, The Stream Classes, Console I/O, FileStream and Byte-Oriented File I/O, Character-Based File I/O, Redirecting the Standard Streams.
Delegates, Events-Delegates, Anonymous Functions, Anonymous Methods, Events.

UNIT-4	(12 Periods)

Namespaces, the Preprocessor, and Assemblies
Generics: What Are Generics?, A Simple Generics Example, A Generic Class with Two Type Parameters, The General Form of a Generic Class, Creating a Generic Method, Generic Interfaces.
Collections, Enumerators, and Iterators: Collections Overview, The Non-Generic Collections::The Non-Generic Interfaces, The Dictionary Entry Structure, The Non-Generic Collection Classes:::ArrayList, Hashtable, The Generic Collections:: The Generic Interfaces, The KeyValuePair <TKey, TValue> Structure, The Generic Collection Classes::: The Dictionary<TKey, TValue> Class.

Text Books :	1. C# 4.0 The Complete Reference by Herbert Schildt, Tata McGraw Hill, 2010.
References :	1. Programming C# 5.0 by Ian Griffiths, O'REILLY, 2012. 2. Programming C#, 2nd Edition, O'REILLY, 2002. 3. Programming C# 3.0, Fifth Edition, Jesse Liberty & Donald Xie, O'Reilly Publ.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS306.1	2	2	2	-	-	-	-	-	2	-	-	2	3	3	2
14CS306.2	2	2	2	-	-	-	-	-	2	-	-	2	3	3	2
14CS306.3	2	2	2	-	-	-	-	-	2	-	-	2	3	3	3
14CS306.4	2	2	2	-	-	-	-	-	2	-	-	2	3	3	3

SOFT SKILLS LAB

II B.Tech – III Semester (Code: 14ELL301)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14ELL301.1	To help students to develop formal communication skills in a work place
14ELL301.2	To make them acquire team skill by working in group activities
14ELL301.3	To enhance the ability of critical & lateral thinking while addressing the issues at any situation.
14ELL301.4	To enable them to present themselves confidently in job interviews.

LIST OF EXPERIMENTS

1. **BODY LANGUAGE**
   a. Facial Expressions.
   b. Kinesics.
   c. Oculesics.
   d. Haptics.
   e. Proxemics.
   f. Para Linguistics.
2. **LIFE SKILLS**
   a. Positive Attitude
   b. Social Behavior & Social Norms.
   c. Ethics, Values and Positive Work Ethics.
   d. Time Management
   e. Goal Setting, Vision, Mission.
3. **EMOTIONAL INTELLIGENCE**
   a. Self-Awareness through Johari Window and SWOT analysis.
   b. Self-Control.
   c. Self-Motivation.
   d. Empathy.
   e. Social Skills.
   f. Self Esteem.
   g. Managing stress.
   h. Assertiveness**.**
4. **PROBLEM SOLVING SKILLS**
   a. Critical Thinking and Brain Storming
   b. Lateral Thinking and Six Thinking Hats.
   c. Creative Thinking.
   d. Conflict Management.
5. **EMPLOYABILITY SKILLS**
   a. Group Discussion.
   b. Team Building and Leadership Qualities
   c. Interview Skills.

References :	1. "The Definitive Book Of Body Language", Allan & Barbara Pease 2. "You Can Win", Shiv Khera. 3. "Lateral Thinking", Edward De Bono. 4. "How To Prepare For Group Discussions And Interview", Hari Mohan Prasad, Rajnish Mohan, 2nd Edition, TMH. 5. "Emotional Intelligence", Daniel Goleman. 6. " The 7 Habits Of Highly Effective People", Stephen R. Covey 7. "Working in Teams", Sandy Pokras.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14ELL301.1	-	-	-	-	-	-	-	-	3	3	3	3	-	-	-
14ELL301.2	-	-	-	-	-	-	-	-	2	-	3	-	-	-	-
14ELL301.3	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-
14ELL301.4	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-

DATA STRUCTURES LAB

II B.Tech – III Semester (Code: 14CSL302)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving with Programming (14CPL203)

Course Outcomes: Students will be able to:

14CSL302.1	Understand and program basic data structures like arrays and linked lists with their applications.
14CSL302.2	Understand and Program data structures like stacks and queues with their applications. Understand and implement sorting algorithms.
14CSL302.3	Understand and program on trees, binary trees, binary search trees, avl trees, expression trees and their traversal methods.
14CSL302.4	Understand and program on priority queues, hashing and their mechanisms. Basic knowledge of graphs representations and traversing methods.

LIST OF EXPERIMENTS

1. Code the following list ADT operations using array, single linked list, double linked list.
   (a). void is_emptyList(List L) (b). List makeNullList(size n)
   (c). Position firstPost(List L) (d). Position endPost(List L)
   (e). Position nextPost(List L, Position p) (f). Position prevPos(List L, position p)
   (g). Position find(List L, Element x) (h). Position findKth(List L, int k)
   (i). void insert(List L, Position p) (j). void delete(List L, Position p)
   (k). void append(List L, Element x) (l). int cmp(List L, Position p1, Position p2)
   (m). int cmp2(List L, List L, Position p1, Position p2)
   (n). void swap(List L, Position p1, Position p2)
   (o). Element retrieveElement(List L, Position p)
   (p). void printElement(List L, Position p)
2. Using the above List ADT operations, write a menu driven program to support following higher level list operations: (a). Create null list, (b). Read a list of elements into the list, (c). insert an element in the K^{th} position of the list, (d). Delete an element in the K^{th} position of the list, (e). Delete a given element from the list, (f). Find whether given element is present in the list, (g). Display the elements of the list
3. Write a program that reads two lists of elements, prints them, reverses them, prints the reverse list, sort the lists, print the sorted lists, merges the list, prints merge list.
4. Implement a polynomial ADT and write a program to read two polynomials and print them, adds the polynomials, prints the sum, multiply the polynomials and print the product.
5. Implement stack ADT and write a program that reads an infix arithmetic expression of variables, constants, operators (+, -, *, /) and converts it into the corresponding postfix form. Extend the program to handle parenthesized expression also.

6. Implement Queue ADT and write a program that performs Radix sort on a given set of elements.
7. Implement the following sorting operations: -
   (a). Shell Sort (b). Heap Sort (c). Merge Sort (d). Quick Sort
8. Implement Binary Tree ADT and write a program that reads postfix Arithmetic expression form, builds the expression tree and performs tree Traversal on it.
9. Implement Binary search ADT and write a program that interactively allows (a) Insertion (b) Deletion (c) Find_min (d) Find_max (e) Find operations
10. Implement AVL Tree ADT and Write a program that interactively allows (a) Insertion (b) Deletion (c) Find_min (d) Find_max
11. Implement Hashing and Write a program to find an element using Open Addressing.

Text Books :	1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL302.1	3	2	-	2	-	-	-	-	-	-	-	2	2	3	-
14CSL302.2	2	3	-	2	-	-	-	-	-	-	-	-	3	2	-
14CSL302.3	3	-	-	2	-	-	-	-	-	-	-	2	2	3	-
14CSL302.4	3	-	3	2	2	-	-	-	-	-	-	2	2	3	2

OBJECT ORIENTED PROGRAMMING LAB

II B.Tech – III Semester (Code: 14CSL303)

Practical	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CSL303.1	Write and implement programs using variables, operators, control statements, arrays, strings, classes and objects.
14CSL303.2	Write and implement programs on Operator Overloading, Indexers, Properties, Inheritance, Interfaces, Structures, and Enumerations.
14CSL303.3	Understand and write programs on Exception Handling, I/O, Delegates and Events.
14CSL303.4	write programs on Namespaces, Preprocessors, Assemblies, Generics, Collections, Enumerators, and Iterators.

LIST OF EXPERIMENTS

1. Implement a class List and the list operations. Use all possible basic features of C#.
2. Write a C# program to demonstrate Arrays (2-D and jagged).
3. Design a class to demonstrate String class methods.
4. Design an appropriate class that represents a mathematical entity and provide the operations with Operator Overloading.
5. Implement a class hierarchy with Abstract Classes, Virtual methods & Overriding.
6. Implement a class clock that publishes seconds change event. Design classes that subscribe to the event with respective behaviours.
7. Design a Data Structure with Exception Handling.
8. Write a program to demonstrate Generic Class Generic Method.
9. Write a program to demonstrate Collections and Generic Collections.
10. Write a C# program to determine the Generic Classes Generic Methods and Generic Interfaces.

Text Books :

1. C# 4.0 The Complete Reference by Herbert Schildt, Tata McGraw Hill, 2010.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL303.1	2	2	2	-	-	-	-	-	2	-	-	2	2	3	2
14CSL303.2	2	2	2	-	-	-	-	-	2	-	-	2	2	3	2
14CSL303.3	2	2	2	-	-	-	-	-	2	-	-	2	2	3	3
14CSL303.4	2	2	2	-	-	-	-	-	2	-	-	2	2	3	3

ENGINEERING MATHEMATICS – IV

II B.Tech – IV Semester (Code: 14MA401)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Elementary calculus, Counting Principles

Course Outcomes: Students will be able to:

14MA401.1	The Knowledge to understand the fundamentals of Complex Analysis like nth roots of a Complex number, Analytic Function, Continuity, Harmonic Conjugates and their important role of applicability in the evaluation of complex integrals.
14MA401.2	The Ability to derive the series expansions of given complex functions by Taylor series and Laurent Series, Evaluate certain complicated real integrals under Contour integration using residue calculus.
14MA401.3	The Aptitude to learn about the concept of random variables and their properties, Evaluation of various Sampling Distributions, Statistical analysis for making decisions and choosing actions.
14MA401.4	The Capability to infer the meaningful conclusions to the given data using statistical methods like Point Estimation, Interval Estimation, Tests of Hypotheses (Concerning Means, Variances & Proportions).

UNIT-1 (14 Periods)

Complex numbers and functions: Introduction to Complex Numbers, Complex Plane, Polar form of Complex numbers, Powers and roots, Derivative, Analytic Function, Cauchy - Riemann Equations, Laplace's equation.

Complex Integration: Cauchy's Integral Theorem, Cauchy's Integral Formula.

UNIT-2 (12 Periods)

Taylor, Laurent series and Residue Integration: Taylor Series (without proof) and McLaren series, Laurent Series(without proof), singularities and zeros, infinity, Residue Integration method, Evaluation of real integrals.

UNIT-3 (12 Periods)

Probability Densities: Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Joint Distributions, Discrete and Continuous.

Sampling Distribution: Populations and Samples, Sampling Distribution of the Mean (σ known), Sampling Distribution of the Mean (σ Unknown), Sampling Distribution of the Variance.

UNIT-4 (12 Periods)

Inferences Concerning Means: Point Estimation, Interval Estimation, Tests of Hypotheses, Null Hypotheses and significance of tests, Hypotheses Concerning one Mean, Inferences Concerning Two Means.

Inferences Concerning Variances: Estimation of Variances, Hypotheses Concerning One

Variance, Hypotheses Concerning Two Variances.
Inferences Concerning Proportions: Estimation of Proportions, Hypotheses Concerning One Proportion

Text Books :	1. "Advanced Engineering Mathematics", Erwin Kreyszig, 9th Edition, John Wiley, 2000. 2. Miller & Freund's "Probability and Statistics for Engineers", Richard A. Johnson, 8th Edition, PHI.
References :	1. "Theory and Problems of Complex Variables", Murray R Spiegel, Schaum's outline series.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14MA401.1	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
14MA401.2	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
14MA401.3	3	2	-	3	-	-	-	-	-	-	-	-	2	-	-
14MA401.4	3	2	-	3	-	-	-	-	-	-	-	-	3	-	-

PROFESSIONAL ETHICS & HUMAN VALUES II B.Tech – IV Semester (Code: 14CS402)					
Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving with Programming(14CP206)

Course Outcomes: Students will be able to:

14CS402.1	Comprehend a specific set of behaviors and values the professional interpreter must know and must abide by, including confidentiality, honesty and integrity.
14CS402.2	Understand the moral requirements of engineering experiments, and have the ability to apply their knowledge to the solution of practical and useful problems.
14CS402.3	Understand Lack of communication, prejudice in not asking for clarification, fear of law and plain neglect will lead to the occurrence of many repetitions of past mistakes.
14CS402.4	Understand the professional ethics & human values and understanding of the different real time case studies.

UNIT-1 (13 Periods)

Human Values: Morals, Values and Ethics, Integrity, Work Ethics, Service and Learning, Civic Virtue, Respect for Others, Living Peacefully, Caring and Sharing, Honesty, Courage, Value Time, Cooperation, Commitment and Empathy, Spirituality, Character.

Engineering Ethics: History of Ethics, Engineering Ethics, Consensus and Controversy, Profession and Professionalism, Professional Roles of Engineers, Self Interest, Customs and Religion, Uses of Ethical Theories, Professional Ethics, Types of Inquiry, Kohlberg's Theory, Gilligan's Argument, Heinz's Dilemma.

Engineering as Social Experimentation: Comparison with Standard Experiments, Knowledge Gained, Conscientiousness, Relevant Information, Learning from the Past, Engineers as Managers, Consultants, and Leaders, Accountability, Roles of Codes, Codes and Experimental Nature of Engineering.

UNIT-2 (13 Periods)

Engineers' Responsibility for Safety and Risk: Safety and Risk, Types of Risks, Safety and the Engineer, Designing for Safety, Risk-Benefit Analysis, Accidents.

Responsibilities and Rights: Collegiality, Two Senses of Loyalty, Obligations of Loyalty, Misguided Loyalty, Professionalism and Loyalty, Professional Rights, Professional Responsibilities, Conflict of Interest, Self-interest, Customs and Religion, Collective Bargaining, Confidentiality, Acceptance of Bribes/Gifts, Occupational Crimes, Whistle Blowing.

UNIT-3 (12 Periods)

Global Issues: Globalization, Cross-cultural Issues, Environmental Ethics, Computer Ethics, Weapons Development, Ethics and Research, Analyzing Ethical Problems in Research, Intellectual Property Rights (IPRs).

Ethical Audit: Aspects of Project Realization, Ethical Audit Procedure, The Decision Makers, Variety of Interests, Formulation of the Brief, The Audit Statement, The Audit Reviews.

UNIT-4	(12 Periods)
Case Studies: Bhopal Gas Tragedy, The Chernobyl Disaster. **Appendix 1:** Institution of Engineers (India): Sample Codes of Ethics. **Appendix 2:** ACM Code of Ethics and Professional Conduct.	
Text Books :	1. "Professional Ethics & Human Values", M.GovindaRajan, S.Natarajan, V.S.SenthilKumar, PHI Publications 2013.
References :	1. "Ethics in Engineering", Mike W Martin, Ronald Schinzinger, TMH Publications.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS402.1	-	-	-	-	-	2	2	3	1	1	-	-	-	-	-
14CS402.2	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-
14CS402.3	-	-	-	-	-	1	1	3	1	1	-	-	-	-	-
14CS402.4	-	-	-	-	-	1	1	3	1	1	-	-	-	-	-

COMPUTER ORGANIZATION II B.Tech – IV Semester (Code: 14CS403)					
Lectures	:	4Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving with Programming (14CP206), Operating Systems (14CS304)

Course Outcomes: Students will be able to:

14CS403.1	Understand the basic structure, operation of a digital computer, machine instruction and programs.
14CS403.2	Understand the execution of instructions, Hardwired control and Micro programmed control unit design.
14CS403.3	Understand basic computer arithmetic algorithms and operations..
14CS403.4	Understand the hierarchical memory system including cache memories and virtual memory. Identify where, when and how enhancements of computer performance can be accomplished

UNIT-1 (16 Periods)

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers.
MACHINE INSTRUCTIONS AND PROGRAMS: Numbers, Arithmetic Operations and Characters, Memory locations and addresses, Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Subroutines, Additional Instructions.

UNIT-2 (15 Periods)

BASIC PROCESSING UNIT: Some fundamental concepts, Execution of a complete instruction, Multiple –Bus Organization, Hardwired control, Micro programmed control.
ARITHMETIC: Addition and Subtraction of Signed Numbers, Multiplication of Positive numbers, Signed operand multiplication, Fast multiplication, Integer Division, Floating point numbers and operations.

UNIT-3 (15 Periods)

THE MEMORY SYSTEM: Some Basic Concepts, Semiconductor RAM Memories, Read-Only memories, Speed, Size and Cost, Cache Memories, performance Considerations, Virtual memories, Memory management Requirements, Secondary Storage.
PIPELINING: Basic Concepts, Data Hazards, Instruction hazards, Influence on Instruction Sets, Data path and Control Considerations, Superscalar Operation, performance Considerations.

UNIT-4 (14 Periods)

INPUT/OUTPUT ORGANIZATION: Interrupts, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces: PCI Bus, SCSI Bus, USB Bus.

Text Books :	1. "Computer Organization", Carl Hamacher, ZvonkoVranesic, SafwatZaky, Fifth Edition, McGraw Hill.

References :	1. "Computer Architecture and Organization", John P. Hayes, Third Edition, McGraw Hill. 2. "Computer Organization and Architecture", William Stallings, 6th Edition, Pearson/PHI. 3. "Computer Systems Architecture", M. Morris Mano, Third Edition, Pearson/PHI.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS802.1	3	2	-	1	-	-	-	-	-	-	-	2	3	-	2
14CS802.2	3	3	3	3	-	-	-	-	-	-	-	2	3	3	3
14CS802.3	1	2	3	3	-	-	-	-	-	-	-	2	3	2	3
14CS802.3	-	2	1	2	-	-	-	-	-	-	-	2	3	2	3

DESIGN AND ANALYSIS OF ALGORITHMS

II B.Tech – IV Semester (Code: 14CS404)

Lectures	:	4Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving with Programming (14CP206), Data Structures (14CS305)

Course Outcomes: Students will be able to:

14CS404.1	Understand concepts of Algorithm complexities. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and conquer algorithms. Derive and solve recurrences describing the performance of divide and conquer algorithms.
14CS404.2	Understand the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them. Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic programming algorithms, and analyze them.
14CS404.3	Understand the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate. Synthesize new graph algorithms and algorithms that employ graph computations as key components, and analyze them. Understand the concepts of Back tracking with suitable examples.
14CS404.4	Understand a linear program and cite problems that can be solved using linear programming. Reduce problems to linear programming formulations. Understand the complexity of various linear programming approaches. Explain basic complexity classes such as P, NP, and NP-complete, and be able to use analysis and reduction techniques to show membership or non-membership of a problem in these classes. Understand and explain approaches to dealing with problems that are NP-complete such as the design of heuristic, approximation, or fixed-parameter algorithms.

UNIT-1 (16 Periods)

Introduction: Algorithm Design paradigms – motivation, concept of algorithmic efficiency, run time analysis of algorithms, Asymptotic Notations.

Divide and Conquer: General method, Merge sort, Quick sort, Strassen's Matrix Multiplication.

UNIT-2 (15 Periods)

Greedy Programming: The general method, Knapsack problem, Job sequencing with deadlines, Minimum Spanning Trees – Prim's Algorithm and Kruskal's algorithm, Single source shortest paths – Dijkstra's Algorithm.

Dynamic Programming: The general method, Multi stage Graphs – Forward & Backward Approach, longest Common sequence, 0/1 knapsack, Reliability design, Traveling Salesman Problem.

UNIT-3	(15 Periods)
Graph Searching and Traversal: Techniques for Graphs – Breath First Search and Traversal, Depth First Search and Traversal, strongly connected components. **Back tracking:** The general method, The 8-Queens problem, Sum of subsets, Knapsack problem.	
UNIT-4	(14 Periods)
Branch and Bound: The general method– Least Cost search, control abstract for LC- Search, Bounding, FIFO branch and bound, LC branch and bound , 0/1 Knapsack problem - LC branch and bound solution, FIFO branch and bound, Travelling Salesman Problem. **Computational Complexity:** Complexity measures, Polynomial Vs Non-polynomial time complexity; The classes NP-hard and NP-complete.	
Text Books :	1. E. Horowitz, S. Sahni and S.Rajsekran, "Fundamentals of Computer Algorithms", Galgotia Publication.
References :	1. T. H. Cormen, Leiserson, Rivest and Stein, "Introduction of Computer Algorithm", PHI. 2. Sara Basse, A.V. Gelder, "Computer Algorithms", Addison Wesley.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS404.1	3	2	-	2	-	-	-	-	-	-	-	2	2	3	-
14CS404.2	2	3	-	2	-	3	-	-	-	-	-	-	3	2	-
14CS404.3	3	-	-	3	-	-	-	-	-	-	-	2	2	3	-
14CS404.4	3	-	3	2	-	2	2	-	-	-	-	2	2	3	2

GUI PROGRAMMING

II B.Tech – IV Semester (Code: 14CS405)

Lectures	:	4 Periods/Week, Self-Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Object Oriented Programming (14CS306)

Course Outcomes: Students will be able to:

14CS405.1	Understand the concepts of Classes and Objects, Inheritance, Interfaces and Packages.
14CS405.2	Understand the concepts of Strings, Library, Exception Handling and Multithreading.
14CS405.3	Understand the concepts of I/O Streams, Event Handling and Applets.
14CS405.4	Understand the concepts of AWT and Swings.

UNIT-1 (16 Periods)

Introduction: Introduction to java, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects: Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Inheritance: Basic concepts, access specifiers, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, Object class.

Interfaces: Differences between classes and interfaces, defining an interface, implementing interfaces, Nested Interfaces, variables in interface and extending interfaces, Default Interface Methods, static Methods in an Interface.

Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages.

UNIT-2 (15 Periods)

Strings: Exploring the String class, String buffer class, Command-line arguments.

Library: Date class, Collection, Enumerations and Wrapper classes.

Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception subclasses.

Multithreading: Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

UNIT-3 (15 Periods)

I/O Streams: Streams, Byte streams, Character streams, File class, File streams.

Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet, Color class and Graphics

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

UNIT-4	(14 Periods)
AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menubar. **Swings** – swings introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.	
Text Books :	1. "Java The Complete Reference", 9th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.
References :	1. "Big Java", 2nd Edition, Cay Horstmann, John Wiley and Sons, Pearson Edu (UNIT–IV). 2. "Java How to Program", Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI. 3. "Core Java 2", Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education. 4. "Core Java 2", Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education. 5. "Beginning in Java 2", Iver Horton, Wrox Publications. 6. "Java", Somasundaram, Jaico. 7. "Introduction to Java programming", By Y.Daniel Liang, Pearson Publication.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS405.1	2	2	2	-	-	-	-	-	2	-	-	2	3	3	2
14CS405.2	2	2	2	-	-	-	-	-	2	-	-	2	3	3	2
14CS405.3	2	2	2	-	-	-	-	-	2	-	-	2	3	3	3
14CS405.4	2	2	2	-	-	-	-	-	2	-	-	2	3	3	3

WEB TECHNOLOGIES

II B.Tech – IV Semester (Code: 14CS406)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving With Programming (14CS206)

Course Outcomes: Students will be able to:

14CS406.1	Know elements and tags of HTML and apply Styles using Cascading Style Sheets.
14CS406.2	Know basics of Java Script, Functions, Events, Objects and Working with browser objects.
14CS406.3	Know basics of XML, DOM and advanced features of XML.
14CS406.4	To convert XML documents into other formats and XSLT.

UNIT-1 (13 Periods)

HTML5: Fundamentals of HTML, Working with Text, Organizing Text in HTML, Working with Links and URLs, Working with Images, Colors, and Canvas, Working with Forms, Working with Multimedia. Overview of CSS, Backgrounds and Color Gradients in CSS, Fonts and Text Styles, Creating Boxes and Columns Using CSS, Displaying, Positioning, and Floating an Element, List Styles, Table Layouts.

UNIT-2 (13 Periods)

Dynamic HTML: Overview of JavaScript, JavaScript Functions, Events, Image Maps and Animations, JavaScript Objects, Working with Browser Objects, Working with Document Object.

UNIT-3 (12 Periods)

Document Object Model, XML: Working with Basics of XML, Implementing Advanced Features of XML, Converting XML Documents in Other Formats, Working with XSLT.

UNIT-4 (12 Periods)

AJAX: Overview of AJAX, Asynchronous Data Transfer with XMLHttpRequest, Implementing AJAX Frameworks, Working with jQuery.

Text Books :

1. Kogent Learning Solutions Inc.,HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and Jquery.

References :

1. Harvey M. Deitel and Paul J. Deitel,"Internet & World Wide Web How to Program", 4/e,Pearson Education.
2. Jason Cranford Teague, "Visual Quick Start Guide CSS, DHTML &AJAX", 4e, Pearson Education.
3. Tom NerinoDoli smith, "JavaScript & AJAX for the web", Pearson Education 2007.
4. Joshua Elchorn, "Understanding AJAX", Prentice Hall 2006.

Course Outcome, Program Objectives & Program Specific Objectives Mapping															
	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS406.1	3	2	3	3	2	-	-	-	2	-	-	-	3	3	3
14CS406.2	3	3	3	3	3	-	-	-	1	-	-	-	3	3	3
14CS406.3	3	3	3	3	-	-	-	-	2	-	-	-	3	3	3
14CS406.4	3	3	2	-	-	-	-	-	2	-	-	-	3	2	2

DESIGN AND ANALYSIS OF ALGORITHMS LAB II B.Tech – IV Semester (Code: 14CSL401)					
Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Problem Solving with Programming (14CPL203), Data Structures (14CSL302)

Course Outcomes: Students will be able to:

14CSL401.1	Understand the Divide and Conquer paradigm and implement Merge Sort, Quick Sort and Strassen's Matrix Multiplication.
14CSL401.2	Understand the greedy paradigm and program on Prim's, Kruskal's, and shortest paths-Dijkstra and Describe the dynamic-programming paradigm and Program to Implement longest common sequence algorithm and Multi-stage graphs using Forward & Backward approach
14CSL401.3	Understand the major graph algorithms and Find the strongly connected components of a graph and Describe Backtracking to Implement N – Queens Problem and Sum of Subsets Problem.
14CSL401.4	Understand Branch and Bound and implement a Program on LC branch and bound algorithm for Traveling Salesman problem

LIST OF EXPERIMENTS

1. Write a Program to Implement Merge sort
2. Write a Program to Implement Quick sort
3. Write a Program to Implement Strassen's Matrix Multiplication
4. Write a Program to Implement Prim's Algorithm
5. Write a Program to Implement Kruskal's Algorithm
6. Write a Program to Implement Dijkstra's Algorithm
7. Write a Program to Implement longest common sequence algorithm
8. Write a Program to Implement Multi-stage graphs using Forward & Backward approach
9. Find the strongly connected components of a graph
10. Write a Program to Implement N – Queens Problem
11. Write a Program to Implement Sum of Subsets Problem
12. Write a Program to Implement LC branch and bound algorithm for Traveling Salesman problem

Text Books :	1. E. Horowitz, S. Sahni and S.Rajsekran, "Fundamentals of Computer Algorithms", Galgotia Publication.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL401.1	3	2	-	2	-	-	-	-	-	-	-	2	2	3	-
14CSL401.2	2	3	-	2	-	3	-	-	-	-	-	-	3	2	-
14CSL401.3	3	-	-	3	-	-	-	-	-	-	-	2	2	3	-
14CSL401.4	3	-	3	2	-	2	2	-	-	-	-	2	2	3	2

GUI PROGRAMMING LAB II B.Tech – IV Semester (Code: 14CSL402)					
Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Object Oriented Programming (14CS306)

Course Outcomes: Students will be able to:

14CSL402.1	Understand the concepts of Classes and Objects, Inheritance, Interfaces and Packages.
14CSL402.2	Understand the concepts of Strings, Library, Exception Handling and Multithreading.
14CSL402.3	Understand the concepts of I/O Streams, Event Handling and Applets.
14CSL402.4	Understand the concepts of AWT and Swings.

LIST OF EXPERIMENTS

1. Write a java program to demonstrate static member, static method and static block.
2. Write a java program to demonstrate method overloading and method overriding.
3. Write a java program to implement multiple inheritance.
4. Write a java program to demonstrate finals, blank finals, final methods, and final classes.
5. Write a program to demonstrate packages.
6. Write a java program to demonstrate interfaces.
7. Write a java program to crate user defined exception class and test this class.
8. Write a java program to demonstrate synchronous keyword.
9. Write am applet program to demonstrate Graphics class.
10. Write GUI application which uses awt components like label, button, text filed, text area, choice, checkbox, checkbox group.
11. Write a program to demonstrate MouseListener, MouseMotionListener, KeyboardListener, ActionListener, ItemListener.
12. Develop swing application which uses JTree, JTable, JComboBox.

Text Books :

1. "Java The Complete Reference", 9th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL402.1	2	2	2	-	-	-	-	-	2	-	-	2	3	3	2
14CSL402.2	2	2	2	-	-	-	-	-	2	-	-	2	3	3	2
14CSL402.3	2	2	2	-	-	-	-	-	2	-	-	2	3	3	3
14CSL402.4	2	2	2	-	-	-	-	-	2	-	-	2	3	3	3

WEB TECHNOLOGIES LAB

II B.Tech – IV Semester (Code: 14CSL403)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CSL403.1	Design different web pages using elements provided in HTML5 with applying different CSS.
14CSL403.2	Design different web pages using Java Script, elements provided in HTML5 with applying different CSS.
14CSL403.3	Design different web pages using XML, elements provided in HTML5 with applying XSLT.
14CSL403.4	Design applications using Ajax and jQuery.

LIST OF EXPERIMENTS

1. Demonstrate all the basic tags in HTML5.
2. Write codes for different types of styles in CSS3.
3. Write java scripts covering Function, recursive functions, Arrays and Objects.
4. Demonstrate collection objects.
5. Demonstrate event model.
6. Write well-formed and valid XML documents.
7. Write code for displaying XML using XSL.
8. Demonstrate Document Object Model for an XML document.
9. Demonstrate Validating an Input Field using AJAX.
10. Build a webpage using JQuery and its components.

Text Books :

1. Kogent Learning Solutions Inc.,HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and Jquery.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL403.1	3	2	3	3	2	-	-	-	-	-	-	-	3	3	3
14CSL403.2	3	3	3	3	3	-	-	-	-	-	-	-	3	3	3
14CSL403.3	3	3	3	3	2	-	-	-	-	-	-	-	3	3	3
14CSL403.4	3	3	2	3	3	-	-	-	-	-	-	-	3	2	2

SOFTWARE ENGINEERING

III B.Tech – V Semester (Code: 14CS501)

Lectures	:	4 Periods	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS501.1	Understand different process models of Software Engineering and Agile Software Development.
14CS501.2	Understand various software engineering practices and how to collect requirements from client and how to analyze the collected requirements.
14CS501.3	Understand how to design and implement the Software Product or Project.
14CS501.4	Understand the concepts of Testing and Measuring the software project or Product.

UNIT-1 (13 Periods)

INTRODUCTION TO SOFTWARE ENGINEERING: The Evolving Role of Software, Software, the Changing Nature of Software, Legacy Software, Software Myths.

A GENERIC VIEW OF PROCESS: Software Engineering - A Layered Technology, a Process Framework, the CMMI, Process Patterns, Process Assessment, Personal and Team Process Models, Product and Process.

PROCESS MODELS: Prescriptive Models, the Waterfall Model, Incremental Process Models, Evolutionary Models, the Unified Process.

AN AGILE VIEW OF PROCESS: What Is Agility? , What Is an Agile Process? , Agile Process Models.

UNIT-2 (13 Periods)

SOFTWARE ENGINEERING PRACTICE: Software Engineering Practice, Communication Practices, Planning Practices, Modeling Practices, Construction Practice, Deployment. **REQUIREMENTS ENGINEERING**: A Bridge To Design and Construction, Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Developing Use-cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.

BUILDING THE ANALYSIS MODEL: Requirements Analysis, Analysis Modeling Approaches, Data Modeling Concepts, Flow-Oriented Modeling, Class Based Modeling Creating a Behavioral Model.

UNIT-3 (12 Periods)

DESIGN ENGINEERING: Design within the Context of Software Engineering, Design Process and Design Quality, Design Concepts The Design Model, Pattern Based Software Design. **CREATING AN ARCHITECTURAL DESIGN**: Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Assessing Alternative Architectural Designs. **MODELING COMPONENT-LEVEL DESIGN**: What Is a Component? , Designing Class-Based Components, Conducting Component-Level Design, Designing Conventional Components. **PERFORMING USER INTERFACE DESIGN**: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

UNIT-4	(12 Periods)

SOFTWARE PROCESS AND PROJECT METRICS: Introduction: Metrics Process and Project Domains, Software Measurement, Metrics for Software Quality, Integrating Metrics with Process.

SOFTWARE QUALITY ASSURANCE: Quality Concepts, Quality Movement, SQA, Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Software Reliability, ISO 9000 Quality Standards, SQA Plan.

SOFTWARE TESTING STRATEGIES: Strategic Approach, Strategic Issues, Test strategies for Conventional Software, Test strategies for Object Oriented Software, Validation Testing, System Testing, The Art of Debugging.

Text Books :	1. Roger S.Pressman, "Software Engineering- A Practitioner's Approach", Sixth Edition,
References :	1. Ian Sommerville, "Software Engineering", Sixth Edition, Pearson Education. 2. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, "Fundamentals of Software Engineering",Second Edition, PHI. 3. RajibMall, "Fundamentals of Software Engineering", Second Edition, PHI.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS501.1	2	-	3	-	3	2	2	2	3	2	3	3	3	-	2
14CS501.2	2	-	3	-	3	2	2	3	3	2	3	3	2	-	2
14CS501.3	2	-	2	-	3	2	2	3	3	3	3	1	3	-	3
14CS501.4	2	-	3	-	2	3	2	3	3	2	2	1	2	-	3

AUTOMATA THEORY & FORMAL LANGUAGES III B.Tech – V Semester (Code: 14CS502)					
Lectures	:	4 Periods	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Discrete Mathematical Structures (14CS302)

Course Outcomes: Students will be able to:

14CS502.1	Construct finite accepters, and convert between deterministic and nondeterministic implementations
14CS502.2	Demonstrate the connection between regular expressions, languages, and grammars
14CS502.3	Describe and simplify a context-free grammar for a given language and Demonstrate the connection between pushdown automata and context-free languages
14CS502.4	Analyze and design Turing machines for a given task

UNIT-1 (13 Periods)

Automata: Introduction to Automata, The central concepts of automata theory - Alphabets, Strings, Languages.

Finite Automata: An Informal picture of finite automata, Deterministic finite automata (DFA) - Definition of DFA, DFA processing strings, Notations for DFA, Extended transition function, the language of DFA, Non deterministic finite automata (NFA) – Definition of NFA, Extended transition function, the language of NFA, Equivalence of DFA and NFA Finite

Automata with ∈ transitions: Use of ∈ - transition, notation for an ∈ - NFA, Epsilon closures, extended transitions and languages, Applications.

UNIT-2 (13 Periods)

Regular Expressions and Languages: Regular expressions, finite automata and regular expressions, Algebraic laws of regular expressions.

Properties of Regular Languages: Proving languages are not regular – Pumping lemma for regular languages, Applications of the pumping lemma, Closure Properties of Regular Languages, Equivalence and minimization of automata – Minimization of DFA.

UNIT-3 (12 Periods)

(Construction based treatment & proofs are excluded)

Context Free Grammars: Context Free Grammars, Parse Trees, Constructing parse trees, derivations and parse trees, ambiguous grammars.

Pushdown Automata: Definition of the Pushdown automata, the languages of PDA, Equivalences of PDA's and CFG's.

Context free languages: Normal form's for context- Free grammars, the pumping lemma for context free languages.

UNIT-4 (12 Periods)

Properties of Context free languages: closure properties for context free languages, Decision properties for CFL's.

Introduction to Turing Machines: The Turing Machine, programming techniques for Turing

machines.
Undecidability: a language that is not recursively enumerable, an undecidable problem that is RE, Undecidability problems about TM, Post's Correspondence problem.

Text Books :	1. John.E.Hopcroft, R.Motwani, &Jeffery.D Ullman, "Introduction to Automata Theory Languages and Computations", Second Edition, Pearson Education, 2003.
References :	1. Cohen, "Computer Theory", KLP Mishra &N.Chandrasekharan, "Theory of Computation", PHI. 2. H.R.Lewis, C.H.Papadimitriou, "Elements of The theory of Computation", Second Edition, Pearson Education, 2003. 3. J.Martin, "Introduction to Languages and the Theory of Computation", Third Edition, Tata McGraw Hill, 2003. 4. MichealSipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997. 5. Ragade, "Automata and Theoretical Computer Science", First Edition, Pearson Education, 2004. 6. John E Hopcroft& Jeffery D Ullman, "Introduction to Automata Theory & Languages and Computation", Narosa Publishing House.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS502.1	2	1	-	-	-	-	-	-	-	-	-	-	2	-	-
14CS502.2	-	-	1	-	-	3	-	-	-	-	-	-	-	3	-
14CS502.3	-	3	-	-	-	-	-	1	-	2	-	-	-	-	1
14CS502.4	-	-	-	2	-	-	-	-	-	3	-	1	1	-	-

MICROPROCESSORS AND MICROCONTROLLERS III B.Tech – V Semester (Code: 14CS503)					
Lectures	:	4 Periods, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: DLD (14CS303) ,CO (14CS403)

Course Outcomes: Students will be able to:

14CS503.1	Understand J2EE as an architecture and platform for building and deploying web-based enterprise applications. Learn how to build database-driven, Web applications using Java. Demonstrate the functionality of Java Servlets.
14CS503.2	Demonstrate the functionality of JSP and JSF applications
14CS503.3	Develop Web Service and Socket applications.
14CS503.4	Understand the EJB architecture and have a good grasp on when to use and how to use various EJB bean types and acquire relevant Java programming experience.

UNIT-1 (16 Periods)

The 8086 Microprocessor Family, the 8086 Internal Architecture: Introduction to Programming the 8086.8086 Family Assembly Language Programming, Implementing standard Program Structures in 8086 Assembly language, Strings , Procedures and Macros.

UNIT-2 (15 Periods)

8086 System Connections, Timing: The Basic8086 Microcomputer System, 8086 Bus activities during the Read and Write Machine Cycles, 8086 pin Diagram; 8086 Interrupts and Interrupt Applications: 8086 Interrupts and Interrupts Responses.

UNIT-3 (15 Periods)

Interfacing Peripherals and Applications: Interfacing the Microprocessor to the Keyboard, Alphanumeric displays; 8259 Priority Interrupt Controller, 8237 DMA Controller. The 8051 Microcontrollers – Assembly language Programming- JUMP, LOOP, CALL instructions.

UNIT-4 (14 Periods)

Micro Controllers: I/O port Programming- addressing Modes, Arithmetic, Logic, Single – bit instructions and Programming-Timer Counter programming in the 8051, Interrupts Programming.

Text Books :	1. Douglas V. Hall, “Microprocessors and Interfacing”, Tata McGraw-Hill, Revised Second Edition. 2. Muhammad Ali Mahadi and Janice Gillespie Mazidi, “The 8051 Microcontroller and Embedded Systems”, Pearson Education 2004
References :	1. Yu-cheng Liu, Glenn A. Gibson, “Microcomputer systems: The 8086 /8088 Family architecture, Programming and Design”, Second edition, Prentice Hall of India, 2003. 2. Barry B. Brey, “The Intel Microprocessors, 8086/8088, 80186/80188,

	80286, 80386, 80486, Pentium, PentiumPro Processor, PentiumII, PentiumIII, PentiumIV, Architecture, Programming & Interfacing", Sixth Edition, Pearson Education Prentice Hall of India, 2002.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS503.1	1	-	-	2	-	-	-	-	-	3	-	-	1	-	2
14CS503.2	-	-	-	-	-	2	-	1	-	-	3	-	-	-	1
14CS503.3	-	1	2	-	-	-	3	-	-	-	-	-	1	-	-
14CS503.4	1	-	-	-	-	-	-	3	-	2	-	-	-	2	1

DATABASE MANAGEMENT SYSTEMS

III B.Tech – V Semester (Code: 14CS504)

Lectures	:	4 Periods, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Data Structures (14CS305)

Course Outcomes: Students will be able to:

14CS504.1	Familiarize with fundamental concepts of database and various database architectures and Design relations for Relational databases using conceptual data modeling.
14CS504.2	Implement formal relational operations in relational algebra and SQL.
14CS504.3	Identify the Indexing types and normalization process for relational databases
14CS504.4	Use mechanisms for the development of multi user database applications.

UNIT-1 (16 Periods)

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - When Not to Use a DBMS

Database System Concepts and Architecture: Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems

Data Modeling Using the Entity-Relationship (ER) Model : Using High-Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types - Refining the ER Design for the COMPANY Database - ER Diagrams, Naming Conventions, and Design Issues

UNIT-2 (15 Periods)

The Relational Algebra and Relational Calculus: Unary Relational Operations: SELECT and PROJECT - Relational Algebra Operations from Set Theory - Binary Relational Operations: JOIN and DIVISION - Additional Relational Operations - The Tuple Relational Calculus - The Domain Relational Calculus

SQL-99: Schema Definition, Constraints, Queries, and Views : SQL Data Definition and Data Types - Specifying Constraints in SQL - Schema Change Statements in SQL - Basic Queries in SQL - More Complex SQL Queries - INSERT, DELETE, and UPDATE Statements in SQL - Views (Virtual Tables) in SQL

UNIT-3 (15 Periods)

Disk Storage, Basic File Structures: Introduction - Secondary Storage Devices - Buffering of Blocks - Placing File Records on Disk - Operations on Files - Files of Unordered Records (Heap Files) - Files of Ordered Records (Sorted Files) - Types of Single-Level Ordered Indexes Multilevel Indexes - Dynamic Multilevel Indexes Using B-Trees and B+-Trees - Indexes on Multiple Keys

Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary

Keys - General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form
Relational Database Design Algorithms and Further Dependencies: Properties of Relational Decompositions - Algorithms for Relational Database Schema Design - Multi-valued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form.

UNIT-4 (14 Periods)

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions - Characterizing Schedules Based on Recoverability - Characterizing Schedules Based on Serializability

Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering – Multi version Concurrency Control Techniques - Validation (Optimistic) Concurrency Control Techniques - Granularity of Data Items and Multiple Granularity Locking

Database Recovery Techniques: Recovery Concepts - Recovery Techniques Based on Deferred Update - Recovery Techniques Based on Immediate Update - Shadow Paging

Text Books :
1. Fundamentals of Database Systems, Ramez Elmasri and Navate Pearson Education, 5th edition.

References :
1. Introduction to Database Systems, C.J.Date Pearson Education
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
3. Data base System Concepts, Silberschatz, Korth, McGraw hill, 5th edition.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS504.1	3	2	3	3	-	-	-	-	-	-	-	-	3	3	3
14CS504.2	3	3	3	3	3	-	-	-	-	-	1	-	3	3	3
14CS504.3	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
14CS504.4	3	3	2	-	-	-	-	-	-	3	-	-	3	2	2

ENTERPRISE PROGRAMMING-I

III B.Tech – V Semester (Code: 14CS505)

Lectures	:	4 Periods/Week, Self-Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Object Oriented Programming (14CS306), Web Technologies (14CS406)

Course Outcomes: Students will be able to:

14CS505.1	Understand the environment of .NET Framework and Visual Studio and it helps to develop various applications with the help of Web Form fundamentals, Web controls and HTML Server controls.
14CS505.2	Understand the concepts of State Management, Validation of Web Pages and Displaying Web Pages more effectively by using Rich Controls and Styles, Themes & Master Pages.
14CS505.3	Understand the concepts ADO.NET Fundamentals & Data Binding and Connecting to a Database by using Data Controls & LINQ.
14CS505.4	Understand the deployment of ASP.NET Applications and How to Work with Services & MVC Application.

UNIT-1 (16 Periods)

The .NET Framework: C#, VB, and the .NET Languages, Intermediate languages, Common language runtime, the .NET class library, Visual Studio**.**

Visual Studio: The promise of visual studio, creating websites, designing a webpage, Exploring the anatomy of web form, writing code, Debugging

Web Form Fundamentals: Understanding the anatomy of an ASP.NET application, Introducing server controls, improving the currency converter, taking a deeper Look at HTML control classes, using the page class, using Application events.

Web Controls: Stepping up to web controls, web control classes, List controls, Table controls, Web control events and AutoPostBack, An interactive web page.

Error Handling, Logging, and Tracing: Avoiding common errors, understanding exception Handling, Handling exceptions, throwing your own exceptions, using page Tracing

UNIT-2 (15 Periods)

State Management: Understanding the problem of the state, using View State, Transferring information between pages, using cookies, managing session state Configuring session state, using application state

Validation: understanding the validation, using the validation controls. Rich Controls: The calendar, The Ad Rotator, pages with multiple views: Multiview , Wizard Control.

Styles, Themes, and Master Pages: Styles, Themes, master page basics, advanced master pages.

UNIT-3 (15 Periods)

ADO.NET Fundamentals: Understanding databases, configuring your database, Understanding SQL basics, Understanding the data provider model, using direct data Access, using disconnected data access.

Data Binding: Introducing data binding, using single valued data binding, using repeated value data binding, working with data source controls.

The Data Controls: The grid view, formatting the grid view, selecting a grid view row, Editing with a grid view row, sorting and paging in grid view, using grid view templates The details view and form view.

LINQ and the Entity Framework: understanding LINQ, LINQ basics, using entity framework, Getting more advanced with entity framework, using the entity data source.

UNIT-4	(14 Periods)

Deploying ASP.NET Applications: ASP.NET applications and the web server, Internet information and services (IIS), managing websites with IIS manager, deploying a site, deploying with visual studio.

Working with Services: What is WCF Web Service, Application for Creating and Consuming a WCF Web Service?

Putting ASP.NET MVC in Context: Understanding the history of ASP.NET, Key Benefits of ASP.NET MVC.

Your First MVC Application: Preparing Visual Studio, Creating a new ASP.NET MVC Project, Rendering Web Page, Creating a simple Data Entry Application.

Text Books :	1. "Beginning ASP.NET 4.5 in C#", Matthew MacDonald, Apress Publishing Company. 2. "Professional ASP.NET 4.5 in C# and VB", Jason N. Gaylord, Christian Wenz , Pranav Rastogi, Todd Miranda, Scott Hanselman, John Wiley & Sons, Inc., Indianapolis, Indiana 3. "Pro ASP.NET MVC 5", Adam Freeman, Apress Publishing Company.
References :	1. "Microsoft Windows Communication Foundation Step by Step", john sharp, Microsoft Press.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS505.1	-	-	3	-	3	-	1	-	1	1	-	1	1	2	2
14CS505.2	-	-	3	-	3	-	1	-	3	1	-	1	1	2	1
14CS505.3	-	2	1	-	3	-	1	1	3	1	-	1	-	2	3
14CS505.4	-	2	1	-	3	-	1	-	3	1	-	1	-	3	3

ARTIFICIAL INTELLIGENCE

ELECTIVE-I

III B.Tech – V Semester (Code: 14CS506(A))

Lectures	:	4 Periods	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Design and Analysis of Algorithms (14CS404)

Course Outcomes: Students will be able to:

14CS506(A).1	Understand How to define a problem as a state space, problem characteristics, what are production systems and their characteristics and How to solve the problem quickly by using heuristic search techniques.
14CS506(A).2	Understand How to represent knowledge by using Predicate Logic and Rules.
14CS506(A).3	Understand Semantic nets, Conceptual Dependency, Scripts. Planning & Types of Planning.
14CS506(A).4	Understand the concepts of Learning and Expert Systems & Types of Expert Systems.

UNIT-1 (13 Periods)

PROBLEMS, PROBLEM SPACES AND SEARCH: Defining the Problem as a State Space Search - Production Systems - Problem Characteristics -Production System Characteristics - Issues in the Design of Search Programs.

HEURISTIC SEARCH TECHNIQUES: Generate-and-Test - Hill Climbing - Best-First Search - Problem Reduction – Constraint Satisfaction - Means-Ends Analysis

UNIT-2 (13 Periods)

KNOWLEDGE REPRESENTATION USING PREDICATE LOGIC: Representing Simple Facts in Logic Representing Instance and ISA Relationships – Computable Functions and Predicates - Resolution**.**

REPRESENTING KNOWLEDGE USING RULES : Procedural versus Declarative Knowledge - Logic Programming - Forward Versus Backward**,** Reasoning Matching - Control Knowledge**.**

UNIT-3 (12 Periods)

SLOT AND FILLER STRUCTURES: Semantic Nets, Conceptual, Dependency, Scripts.

PLANNING: Overview - An Example Domain: The Blocks Word - Component of Planning Systems – Goal Stack Planning - Non-linear Planning using constraint posting Hierarchical planning, Reactive systems

UNIT-4 (12 Periods)

LEARNING: What is learning? Rote learning - Learning by taking advice learning in problem solving, learning from example: Induction Explanation Based Learning.

EXPERT SYSTEMS: Representing and using domain knowledge Expert system shells Explanation Knowledge Acquisition.

Text Books :

1. ElaineRich & KevinKnight ,“Artificial Intelligence”,2nd Edition, (Tata McGraw Hill Edition)

References :	1. Patrick Henry Winston, “Artificial Intelligence”,Pearson Education. 2. Russel and Norvig, “Artificial Intelligence”, Pearson Education/ PHI

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS506(A).1	3	3	3	-	-	-	-	-	-	-	-	2	3	3	-
14CS506(A).2	3	3	2	3	-	-	-	-	-	-	-	1	2	2	-
14CS506(A).3	-	-	-	-	-	3	2	-	-	-	-	2	2	2	1
14CS506(A).4	-	-	3	2	-	1	-	-	-	-	-	2	-	-	1

PRINCIPLES OF PROGRAMMING LANGUAGES

ELECTIVE-I

III B.Tech – V Semester (Code: 14CS506(B))

Lectures	:	4 Periods	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: C, C#, Java

Course Outcomes: Students will be able to:

14CS506(B).1	Understanding the concept of languages, variable and binding
14CS506(B).2	Understanding the scope, extend, assignment statement and control structures
14CS506(B).3	Understanding the concept of sub programs how to implement and data abstraction in the languages
14CS506(B).4	Understanding the concept of concurrency in sub program, symmetric concurrency and exception handlings

UNIT-1 (13 Periods)

Preliminaries: Reasons, Programming Domains, Language: Evolution Criteria, Categories, Design Trade-offs, Implementation, Programming Environments,

Evolution of Programming Languages.

Describing syntax and Semantics: General Problems, Describing Syntax, Recursive Descent Parsing, Attribute Grammar, Dynamic Semantics.

Primitive data types and variables: Names, variables, Concept of Binding, Type checking, Strong typing, Type compatibility, Named Constants, Variable Initialization.

UNIT-2 (13 Periods)

Scope and Extent: Scope, Scope and Life Time, Referencing Environments.

Data Types: Primitive, character string, User-defined, Array, Associative Arrays, Record, Union, Set, Pointer.

Expression and the Assignment Statement: Arithmetic Expressions, Overloading, Type Conventions, Relational and Boolean, Short Circuit, Assignment, Mixed mode Assignment.

Statement level Control Structures: Compound, Selection, Iterative Statements, Unconditional Branching, Guarded Commands

UNIT-3 (12 Periods)

Subprograms: Fundamentals, Design Issue, Local Referencing Environment, Parameter Passing, Parameters that are sub-program names, Overloaded Sub-programs, Generic, Separate and Independent Compilation, Design Issues for functions, Non-local environments, User Defined Overloaded Operators, Co routines.

Implementing Subprograms: Fortran 77, Algol-like languages, Blocks, Dynamic Scoping, Implementing Parameters that are sub-program names.

Data Abstraction: Concepts, Encapsulation, Data, Introduction, Design Issues, Examples, Parameterized Abstract Data Types.

UNIT-4	(12 Periods)
Symmetric and Concurrent Subprograms: Support for Object Oriented Programming, Design Issues, Smalltalk, Support for Object Oriented Programming in; C++, Java, ADA 95, Implementation **Concurrency:** Sub-program level, Semaphores, Monitors, Message Passing, and Concurrencyin ADA 95, Java Threads, and Statement level concurrency. **Exception handling**: Introduction, Exception Handling in: PL1, ADA, C++, Java.	
Text Books :	1. Robert W. Sebesta, 'Concepts of Programming Languages', Addison Wesley Longman Inc.,1999.
References :	1. Ellis Horowitz, 'Fundamentals of Programming Languages', Galgotia Publications (P) Ltd.,1994. 2. Pratt Terrence. W, 'Programming Languages, Design & Implemented' Prentice Hall of India, 1993.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS506(B).1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(B).2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(B).3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(B).4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MACHINE LEARNING

ELECTIVE-I

III B.Tech – V Semester (Code: 14CS506(C))

Lectures	:	4 Periods	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS506(C).1	Apply regression and decision tree algorithms to data.
14CS506(C).2	Apply non-linear models for classification applications.
14CS506(C).3	Understand evaluation of hypotheses and theory of learning.
14CS506(C).4	Classify data using Discriminative and Generative models for classification.
14CS506(C).5	Understand lazy learning and unsupervised learning algorithms

UNIT-1 (13 Periods)

Linear Regression: Introduction to machine learning**,** Simple linear regression. Multiple linear regression**,** Batch gradient decent algorithm, Stochastic gradient descent algorithm, Locally weighted linear regression.

Decision Tree Learning: Decision Tree representation, appropriate problems for Decision Tree learning, hypothesis space search in Decision Tree learning, inductive bias in Decision Tree learning and issues in Decision Tree learning.

UNIT-2 (13 Periods)

Artificial Neural Networks: Neural Network representations, appropriate problems for Neural Network learning, Perceptron, Multilayer Networks and the Back propagation algorithm and remarks on the Back propagation algorithm, Face recognition.

Evaluating Hypotheses: Estimating hypothesis accuracy, basics of sampling theory, general approach for deriving confidence intervals, difference in error of two hypotheses and comparing learning algorithms.

UNIT-3 (12 Periods)

Generative Classifiers: Learning classifiers based on Bayes Rule, Naïve Bayes Algorithm, Conditional Independence, Derivation of Naïve Bayes Algorithm, Naïve Bayes for discrete-valued Inputs, Naïve Bayes for continuous inputs.

Discriminative Classifiers:: Logistic Regression, Estimating Parameters for Logistic Regression, Regularization in Logistic Regression, Logistic Regression for functions with many discrete values, Relationship between Naïve Bayes classifiers and Logistic Regression.

UNIT-4 (12 Periods)

Computational learning theory: Introduction, probably learning an approximately correct hypothesis, sample complexity for finite hypothesis spaces.

Instance Based Learning: Introduction, k-Nearest Neighbor learning.

Unsupervised Learning: K-means clustering algorithm, Gaussian mixture model, EM algorithm.

Text Books :

1. Tom M. Mitchell, “Machine Learning”, Mc. Graw Hill Publishing.

References :	1. Lecture Notes by Mr. Andrew Ng, Stanford University (cs229.stanford.edu/notes/)

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS506(A).1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(A).2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(A).3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(A).4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

GRAPH THEORY

ELECTIVE-I

III B.Tech – V Semester (Code: 14CS506(D))

Lectures	:	4 Periods	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: DMS,DAA

Course Outcomes: Students will be able to:

14CS506(D).1	Understand the concepts of graphs, types of graphs and traveling sales man problem.
14CS506(D).2	Understand the concepts of binary trees , counting tress and shortest path problems.
14CS506(D).3	Understand the concepts of planer graphs , combinatorial and geometric dual.
14CS506(D).4	Understand the concepts of Vector space of a graph and vectors, basis vector, cut set vector, circuit vector, four color problem Discussion of Graph theoretic algorithm.

UNIT-1 (13 Periods)

Graphs, Sub graphs, some basic properties, various example of graphs & their sub graphs, walks, path & circuits, connected graphs, disconnected graphs and component, euler graphs, various operation on graphs, Hamiltonian paths and circuits, the traveling sales man problem.

UNIT-2 (13 Periods)

Trees and fundamental circuits, distance diameters, radius and pendent vertices, rooted and binary trees, on counting trees, spanning trees, fundamental circuits, finding all spanning trees of a graph and a weighted graph, algorithms of primes, Kruskal and Dijkstra Algorithms.

UNIT-3 (12 Periods)

Cuts sets and cut vertices, some properties, all cut sets in a graph, fundamental circuits and cut sets , connectivity and separability, network flows, Planer graphs, combinatorial and geometric dual: Kuratowski graphs, detection of planarity, geometric dual, Discussion on criterion of planarity, thickness and crossings.

UNIT-4 (12 Periods)

Vector space of a graph and vectors, basis vector, cut set vector, circuit vector, circuit and cut set subspaces, Matrix representation of graph – Basic concepts; Incidence matrix, Circuit matrix, Path matrix, Cut-set matrix and Adjacency matrix. Coloring, covering and partitioning of a graph, chromatic number, chromatic partitioning, chromatic polynomials, matching, covering, four color problem Discussion of Graph theoretic algorithm wherever required.

Text Books :

1. DeoNarsingh, Graph theory with applications to Engineering and Computer Science, PHI

References :

1. Gary Chartrand and Ping Zhang, Introduction to Graph Theory, TMH

	2. Robin J. Wilson, Introduction to Graph Theory, Pearson Education 3. Harary, F, Graph Theory, Narosa 4. Bondy and Murthy: Graph theory and application. Addison Wesley. 5. V. Balakrishnan, Schaum's Outline of Graph Theory, TMH 6. GeirAgnarsson, Graph Theory: Modeling, Applications and Algorithms, Pearson Education

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS506(D).1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(D).2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(D).3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CS506(D).4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MICROPROCESSORS AND MICROCONTROLLER LAB

III B.Tech – V Semester (Code: 14CSL501)

Practical	:	3 Periods	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: DLD (14CS303), CO (14CS403)

Course Outcomes: Students will be able to:

14CSL501.1	Have knowledge to program using 8086 microprocessor.
14CSL501.2	Be equipped with the basic knowledge of microprocessor and microcontroller interfacing and their applications.
14CSL501.3	Interpret programs in assembly language Format.
14CSL501.4	Analyze the interfacing circuitry and programs required for peripheral support chips and other hardware.

LIST OF EXPERIMENTS

1. Write a 8086 assembly language program to arrange the given numbers in ascending order.
2. Write a 8086 assembly language program to count number of +ve elements, -ve elements, zeros in the given array.
3. Write a 8086 assembly language program to find the square of a number using look-up-table.
4. Write a 8086 assembly language program to move a sting byte from a memory location to another memory location.
5. Write a 8086 assembly language program to calculate the maximum and minimum in an array.
6. Write a 8086 assembly language program to convert BCD to binary using near procedures.
7. Write a 8086 assembly language program to demonstrate passing parameters to procedures through registers.
8. Write a assembly language program to move a string from one location to another location using macros.
9. Write a8086 assembly language program to calculate nCr by using near procedures.
10. Assume that 5 BCD data items are stored in RAM locations starting at 40H. Write a program to find the sum of all the numbers. The result must be in BCD.
11. Write a program with three sub-routine to transfer the data from on-chip ROM to RAM location starting at 40H b)add them and save in 60Hc)find the average of the data and store it in R7.notice that data is stored in a code space of on-chip ROM.
12. Program the 8051 timers to generate time delay.

Text Books :

1. Douglas V. Hall, “Microprocessors and Interfacing”, Tata McGraw-Hill, Revised Second Edition.
2. Muhammad Ali Mahadi and Janice Gillespie Mazidi, “The 8051 Microcontroller and Embedded Systems”, Pearson Education 2004

Course Outcome, Program Objectives & Program Specific Objectives Mapping															
	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL501.1	1	-	-	2	-	-	-	-	-	3	-	-	1	-	2
14CSL501.2	-	-	-	-	-	2	-	1	-	-	3	-	-	-	1
14CSL501.3	-	1	2	-	-	-	3	-	-	-	-	-	1	-	-
14CSL501.4	1	-	-	-	-	-	-	3	-	2	-	-	-	2	1

RDBMS LABORATORY USING: ORACLE 9i

III B.Tech – V Semester (Code: 14CSL502)

Practical	:	3 Periods	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CSL502.1	Know how to create tables and views and apply commit and roll back along with save point.
14CSL502.2	Use Selection, Projection, Sorting and Nested Queries on database.
14CSL502.3	Use concepts of Joins along with Set operations.
14CSL502.4	Create user defined objects and Exceptions.
14CSL502.5	Use PL/SQL named and unnamed blocks and Cursors.
14CSL502.6	Use Procedures, Functions, Packages, and Triggers.

LIST OF EXPERIMENTS

1. **Commands in SQL.**
   - i. Creating objects: tables, views, users, sequences, Collections etc.
   - ii. Privilege management through the Grant/Revoke commands
   - iii. Transaction processing using Commit/Rollback
   - iv. Save points.
2. **Simple queries: selection, projection, sorting on a simple table**
   - i. Small-large number of attributes
   - ii. Distinct output values
   - iii. Renaming attributes
   - iv. Computed attributes
   - v. Simple-complex conditions (AND, OR, NOT)
   - vi. Partial Matching operators (LIKE, %, _, *, ?)
   - vii. ASC-DESC ordering combinations
   - viii. Checking for Nulls
3. **Nested queries**
   - i. In, Not In
   - ii. Exists, Not Exists
   - iii. Dynamic relations (as part of SELECT, FROM, and WHERE clauses)
4. **Set Oriented Operations**
   - i. Union
   - ii. Difference
   - iii. Intersection
   - iv. Division
5. **Multi-table queries (JOIN OPERATIONS)**
   - i. Simple joins (no INNER JOIN)
   - ii. Aliasing tables – Full/Partial name qualification
   - iii. Inner-joins (two and more (different) tables)
   - iv. Inner-recursive-joins (joining to itself)
   - v. Outer-joins (restrictions as part of the WHERE and ON clauses)
   - vi. Using where & having clauses

6. User Defined Types

i. Creating Objects

ii. Creating User Defined Operators

7. PL/SQL Programming I

i. Programs using named and unnamed blocks

ii. Programs using Cursors, Cursor loops and records

8. PL/SQL Programming II

i. Creating stored procedures, functions and packages

ii. Error handling and Exception

iii. Triggers and auditing triggers

Text Books :	1. Oracle Database 10g The Complete Reference by Kevin Loney, Tata McGraw-Hill Publishing Company Limited. 2. Oracle 9i PL/SQL Programming by Scott Urman, Tata McGraw-Hill Publishing Company Limited. 3. Simplified Approach to Oracle by Parteek Bhatia, Sanjiv Datta, Ranjit Singh, Kalyani Publishers.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL502.1	3	2	3	3	-	-	-	-	-	-	-	-	3	3	3
14CSL502.2	3	3	3	3	3	-	-	-	-	-	1	-	3	3	3
14CSL502.3	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
14CSL502.4	3	3	2	-	-	-	-	-	-	3	-	-	3	2	2
14CSL502.5	3	3	3	-	-	-	-	-	-	-	-	-	3	2	2
14CSL502.6	3	3	3	-	-	-	-	-	-	-	-	-	3	2	2

ENTERPRISE PROGRAMMING-I LAB

III B.Tech – V Semester (Code: 14CSL503)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Object Oriented Programming (14CS306), Web Technologies (14CS406)

Course Outcomes: Students will be able to:

14CSL503.1	Understand the environment of .NET Framework and Visual Studio and it helps to develop various applications with the help of Web Form fundamentals, Web controls and HTML Server controls.
14CSL503.2	Understand the concepts of State Management, Validation of Web Pages and Displaying Web Pages more effectively by using Rich Controls and Styles, Themes & Master Pages.
14CSL503.3	Understand the concepts ADO.NET Fundamentals & Data Binding and Connecting to a Database by using Data Controls & LINQ.
14CSL503.4	Understand the deployment of ASP.NET Applications and How to Work with Services & MVC Application.

LIST OF EXPERIMENTS

1. Design an ASP.NET application to demonstrate Web Form markup and redirection.
2. Design an ASP.NET application to demonstrate Web Controls.
3. Design an ASP.NET application to demonstrate View State to transfer data between Web Pages.
4. Design an ASP.NET application to demonstrate the use of Cookies.
5. Design an ASP.NET application to demonstrate Session State to transfer data between Web Pages.
6. Design an ASP.NET application to demonstrate Validating ASP.NET Web Pages using Validation Controls.
7. Design an ASP.NET application to demonstrate User Controls.
8. Design an ASP.NET Web Site with Styles, Themes and Master Pages.
9. Design an ASP.NET application to work with SQL Server Database using ADO.NET and Data Controls.
10. Design an ASP.NET application to work with SQL Server Database using LINQ Queries.
11. Design an application to demonstrate a Web Service Creation and Consumption.
12. Design a Simple MVC Web Pages Application.

Text Books :

1. "Beginning ASP.NET 4.5 in C#", Matthew MacDonald, Apress Publishing Company.
2. "Professional ASP.NET 4.5 in C# and VB", Jason N. Gaylord, Christian Wenz , Pranav Rastogi, Todd Miranda, Scott Hanselman, John Wiley & Sons, Inc., Indianapolis, Indiana
3. "Pro ASP.NET MVC 5", Adam Freeman, Apress Publishing Company.

Course Outcome, Program Objectives & Program Specific Objectives Mapping															
	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL503.1	-	-	3	-	3	-	1	-	1	1	-	1	1	2	2
14CSL503.2	-	-	3	-	3	-	1	-	3	1	-	1	1	2	1
14CSL503.3	-	2	1	-	3	-	1	1	3	1	-	1	2	3	3
14CSL503.4	-	2	1	-	3	-	1	-	3	1	-	1	2	3	3

INTRODUCTION TO DATA ANALYTICS

III B.Tech – VI Semester (Code: 14CS601)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Database Management Systems (14CS504)

Course Outcomes: Students will be able to:

14CS601.1	Understand the use of R, Basics of R, Advanced Data Structures, Reading Data into R
14CS601.2	Understand the basic & advanced data management, manipulate data using SQL statements and virtualization of data using different plots
14CS601.3	Understand the Normal distribution, binomial distribution, correlation and covariance, T-test, ANOVA, Manipulating Strings, Linear Models
14CS601.4	Understand the Cluster Analysis and Classification

UNIT-1 (13 Periods)

Introduction to R - Why use R? Obtaining and installing R.
The R Environment - Command line interface, RStudio.
R Packages - Installing packages, loading packages, Building packages.
Basics of R - basic Math, variables, Data types, vectors, calling function, function documentation, missing data.
Advanced Data Structures - data. Frames, Lists, Matrices, Arrays.
Reading Data into R - Reading CSVs, Excel data, reading from databases.

UNIT-2 (13 Periods)

Basic Data Management- A working example, creating new variables, recoding variables, renaming variables, missing values, date values, type conversion, sorting data, merging data set, Subsetting datasets, Using SQL statement to manipulate data.
Advanced Data Management- A data management challenge, Numerical and character functions, a solution for data management challenge, control flow, User Written functions, Aggregate and reshaping.
Basic graphs- Bar plot, pie chart, Histograms, Kernel Density plots, Box plots, dot plots

UNIT-3 (12 Periods)

Probability Distribution - Normal distribution, binomial distribution
Basic statistics - summary statistics, correlation and covariance, T-test, ANOVA
Manipulating Strings- paste, sprintf, extracting text, regular expression.
Linear Models: Simple linear regression, multiple linear regressions.

UNIT-4 (12 Periods)

Cluster Analysis: Cluster Analysis-common steps in cluster analysis, calculating distances, Hierarchical cluster analysis, Partitioning cluster analysis, avoiding nonexistence clusters.
Classifications - Preparing the data, logistic regression, decision trees, random forests, support vector machines, choosing a best predictive solution.

Text Books :	1. R for Every One, Advanced analytics and graphics by Jared P Lander, Addison Wisley Data and analytics series. (UNIT-I, III) 2. R in Action, Data Analysis and graphics with R,Robert L Kabacoff, Manning Publisher (UNIT-II, IV)
References :	1. Beginning R by Dr. Mark Gardener, Wrox publisher. 2. Associate Analytics Facilitator Guide provided by NASSCOM. http://183.82.43.252/~gopam/html/NASSCOM

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS601.1	3	2	-	-	-	-	-	-	-	1	-	2	1	2	1
14CS601.2	1	3	1	2	1	2	-	-	-	3	-	2	2	3	2
14CS601.3	3	2	2	2	3	2	-	-	-	1	-	2	2	3	3
14CS601.4	2	2	2	2	2	2	-	-	-	1	-	2	2	3	2

COMPILER DESIGN

III B.Tech – VI Semester (Code: 14CS602)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Automata Theory & Formal Language (14CS502).

Course Outcomes: Students will be able to:

14CS602.1	Understand the phases of a compiler, various concepts related to Lexical analyzer and various Top down parsers.
14CS602.2	Understand various Bottom up parsers and concepts of Syntax Directed Translation.
14CS602.3	Understand about Run time, storage allocation strategies and concepts of Symbol Table.
14CS602.4	Understand how the intermediate code is generated and the concepts of Basic blocks and flow graphs.

UNIT-1 (13 Periods)

Introduction to compiling: Compilers, The Phases of a compiler.

Simple one-pass compiler: Overview, syntax definition, syntax direct translation, parsing, a translator for simple expressions.

Lexical Analysis: The role of the lexical analyzer, input buffering, simplification of tokens, Recognition of tokens, implementing transition diagrams, a language for specifying lexical analyzers.

Syntax analysis: Top down parsing - Recursive descent parsing, Predictive parsers.

UNIT-2 (13 Periods)

Syntax Analysis: Bottom up parsing - Shift Reduce parsing, LR Parsers – Construction of SLR, Canonical LR and LALR parsing techniques, Parser generators – Yacc Tool.

Syntax – Directed Translation: Syntax Directed definition, construction of syntax trees, Bottom-up evaluation of S – attributed definitions.

UNIT-3 (12 Periods)

Runtime Environment: Source language issues, Storage organization, Storage-allocation strategies, Access to nonlocal names, Parameter passing.

Symbol Tables: Symbol table entries, Data structures to symbol tables, representing scope information.

UNIT-4 (12 Periods)

Intermediate code Generation: Intermediate languages, Declarations, Assignment statements, Boolean expressions, Backpatching.

Code Generation- Issues in the design of code generator, the target machines, Basic blocks and flow graphs, Next use information, A simple code generator

Text Books :

1. Alfred V.Aho, RaviSethi, JD Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education, 2007.

References :	1. lfred V.Aho, Jeffrey D. Ullman, “Principles of Compiler Design”, Narosa publishing. 2. Lex&Yacc”, John R. Levine, Tony Mason, Doug Brown, O’reilly. 3. Modern Compiler Implementation in C”, Andrew N. Appel, Cambridge University Press. 4. “Engineering a Compiler”, Cooper & Linda, Elsevier. 5. Compiler Construction”, Louden, Thomson.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS602.1	-	3	3	2	-	2	-	-	-	-	-	2	1	2	2
14CS602.2	-	3	3	2	-	2	-	-	-	-	-	2	1	2	2
14CS602.3	-	2	-	-	-	1	-	-	-	-	-	2	1	-	-
14CS602.4	-	2	3	1	-	1	-	-	-	-	-	2	1	1	2

COMPUTER NETWORKS

III B.Tech – VI Semester (Code: 14CS603)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS603.1	Understand the concepts of data communications, different protocol architectures, different digital data communication techniques and various data link control methods.
14CS603.2	Understand the design issues of network layer, different routing algorithms and congestion control algorithms, quality of service and IP Addressing.
14CS603.3	Understand the services offered by the transport layer, elements of transport layer and detailed concepts of transport layer protocols TCP and UDP.
14CS603.4	Understand the services offered by the application layer, e-mail (Electronic Mail) services and about WWW(World Wide Web).

UNIT-1 (16 Periods)

Data Communications & Networking Overview: A Communications Model, Data Communications, Data Communication Networking.

Protocol Architecture: The Need for a Protocol Architecture, A Simple Protocol Architecture, OSI, The TCP/IP Protocol Architecture.

Digital Data Communication Techniques: Asynchronous & Synchronous Transmission, Types of Errors, Error Detection, Error Correction

Data Link Control: Flow Control, Error Control, High-Level Data link Control (HDLC).

UNIT-2 (15 Periods)

Network Layer: **Network Layer Design Issues**: Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of Connection-Oriented Service, Comparison of Virtual-Circuit & Datagram Subnets.

Routing Algorithms: The Optimality Principle, Shortest Path, Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing

Congestion Control Algorithms: General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets, Load Shedding, Jitter Control.

Quality of Service: Requirements, Techniques for Achieving Good Quality of Service

The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols.

UNIT-3 (15 Periods)

The Transport Layer: **The Transport Service**: Services Provided to the Upper Layers, Transport Service Primitives, Berkeley sockets

Elements of Transport Protocols: Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery,

The Internet Transport Protocol (UDP): Introduction to UDP, Remote Procedure Call, The Real-Time Transport Protocol.

The Internet Transport Protocols (TCP): Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management, TCP Transmission Policy, TCP Congestion Control, TCP Timer Management

UNIT-4 (14 Periods)

Application Layer: **The Domain Name System(DNS):** The DNS Name Space, Resource Records, Name Servers. **Electronic Mail**: Architecture & Services, The User Agent, Message Formats, Message Transfer, Final Delivery.
The World Wide Web: Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP – Hyper Text Transfer Protocol, Performance Enhancements.

Text Books :

1. Behrouz A.Forouzan, "Data Communications and Networking", 4th edition, TMH.
2. Tanenbaum, "Computer Networks", 4th Edition, (Pearson Education / PHI).

References :

1. Wayne Tomasi, "Introduction to Data Communications and Networking", PHI.
2. Behrouz A.Forouzan, "Data Communications and Networking", Fourth edition, TMH.
3. GodBole, "Data Communications & Networking", TMH.
4. Kurose & Ross, "COMPUTER NETWORKS– A Top-down approach featuring the Internet", Pearson Education, Alberto Leon, Garciak.
5. LeonGartia, IndraWidjaja, "Communication Networks Fundamental Concepts and Key Architectures", TMH.
6. Nader F.Mir, "Computer and Communication Networks", PHI

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS603.1	1	-	-	1	-	-	-	-	-	1	-	1	1	-	-
14CS603.2	1	-	-	1	-	-	-	-	-	1	-	3	1	2	-
14CS603.3	1	-	-	1	-	-	-	-	-	1	-	3	1	1	-
14CS603.4	1	-	-	1	-	-	-	-	-	1	-	3	1	1	-

ENTERPRISE PROGRAMMING-II

III B.Tech – VI Semester (Code: 14CS604)

Lectures	:	4 periods/week,Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: GUI PROGRAMMING (14CS405), WEB TECHNOLOGIES (14CS406)

Course Outcomes: Students will be able to:

14CS604.1	Understand J2EE as an architecture and platform for building and deploying web-based enterprise applications. Learn how to build database-driven, Web applications using Java. Demonstrate the functionality of Java Servlets.
14CS604.2	Demonstrate the functionality of JSP and JSF applications
14CS604.3	Develop Web Service and Socket applications.
14CS604.4	Understand the EJB architecture and have a good grasp on when to use and how to use various EJB bean types and acquire relevant Java programming experience.

UNIT-1 (16 Periods)

The Big Picture: Java EE Architecture, Hello Java EE - Running Hello Java EE, The Many Variations of Java EE Applications, Packaging and Deploying the Hello Java EE Application, Java EE Platform and Implementations.

Classic Memories: JDBC - Introduction to JDBC, Hello JDBC Example, Structured Query Language, The JDBC APIs.

Java Servlets and Web Applications: Foundations of the Web Tier: The HTTP Protocol, Introducing Java Servlets, Understanding the Java Servlet API, Web Applications, Java Servlets: The Good and the Bad.

UNIT-2 (15 Periods)

Dynamic Web Pages: JSP - JSP Runtime Architecture, A JSP Clock, JSP Syntax, the Java Environment for JSPs, JSP Standard Tags, Custom Tag Libraries, Expression Language.

Assembling Dynamic Web Pages: Java Server Faces - Architecture of a JSF Application, Java Server Faces Tags, and Java EE Managed Beans, f: Core Tags, JSTL Core Tags, Extensibility and Modularity.

UNIT-3 (15 Periods)

Web Sites for Non-browsers: JAX-RS - What Are RESTful Web Services, The Java API for RESTful Web Services, HelloResource Example: Server Side, Deploying JAX-RS Resources, HelloResource Example and the Rich Client, Content Production, Content Consumption, Accessing Web Service Context, Exception Mapping, Number of Instances of Resource Classes, Path Mapping.

Adding Sparkle: Java Web Sockets - Introduction to the Web Socket Protocol, the Web Socket Lifecycle, Overview of the Java Web Socket API, Web Socket Clock, Java Web Socket Encoders and Decoders, Message Processing Modes, Path Mapping, Deployment of Server Endpoints.

UNIT-4	(14 Periods)
The Fundamentals of Enterprise Beans: Introduction to Enterprise Beans, Hello Enterprise Beans, Flavors of Enterprise Beans, Exposing Enterprise Beans, Finding Enterprise Beans, EJB Lifecycle, Packaging Enterprise. **Advanced Thinking with Enterprise Beans:** Multi-threading and Enterprise Beans, Asynchronous Enterprise Beans, Enterprise Bean Contexts, the Timer Service, Transactions and Enterprise Beans, Interceptors. **Modern Memories: The Java Persistence API -** The Library Service, with Java Persistence, Persistence Entities, The Entity Manager, Java Persistence Query Language, Configuring JPA Applications.	
Text Books :	1. Dr. Danny Coward, "Java EE 7: The Big Picture", oracle press
References :	1. Arun Gupta "Java EE 7 Essentials" O'Reilly. 2. Antonio Goncalves "Beginning Java EE 7 " apress

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS604.1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
14CS604.2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
14CS604.3	-	2	-	-	-	-	-	-	-	-	-	-	1	-	-
14CS604.4	-	-	-	-	-	-	-	-	-	-	3	-	-	1	-

CLOUD AND MOBILE APPLICATION DEVELOPMENT

III B.Tech – VI Semester (Code: 14CS605)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Object Oriented Programming (14CS306), Enterprise Programming-I (14CS505)

Course Outcomes: Students will be able to:

14CS605.1	Understand the Cloud Computing environment, Windows Azure platform, and Azure services like Windows Azure storage.
14CS605.2	Understand the Windows Azure Virtual Machines and SQL Azure Services.
14CS605.3	Understand the Windows Azure Service Bus and the Android environment using Android Studio, How to build applications and various concepts of Activities.
14CS605.4	Understand various components of User interaction in Android App Development.

UNIT-1 (16 Periods)

Introduction to Cloud Computing & Windows Azure Platform - Approaches to Cloud Computing, Infrastructure as a Service, Software as a Service, Platform as a Service, Cloud Services Defined, Windows Azure and Cloud Computing.

Cloud Applications - Software Development Kits, Windows Azure Tools for Visual Studio, Cloud Project with a Web Role, Deployment to Windows Azure, Configuration and Upgrading, Service Definition File, and Role Properties.

Windows Azure Storage - Local Storage, Windows Azure Storage Account, Windows Azure Management Tool, Blobs, Tables, Queues. Worker Roles - Table Service, Queue Service.

UNIT-2 (15 Periods)

Virtual Machines – Virtual Machine creation, Installing SQL server and J2EE Platform, Connecting to SQL Server on Virtual Machine.

SQL Azure - SQL Azure Features, SQL Azure Database Access, Database Server Creation in the Cloud, SQL Azure Access, SQL Azure Relational Engine Features, Existing Database Migration, SQL Azure Migration Wizard, Applications connecting to SQL Azure.

UNIT-3 (15 Periods)

Service Bus - Service Bus, Relayed messaging, Brokered Messaging- Queues, Topics.

Build your first app - Install Android Studio, Hello World, Logging, Make Your First Interactive UI, Working with TextView Elements**.**

Activities - Create and Start Activities, Activity Lifecycle and State, Activities and Implicit Intents**.**

UNIT-4 (14 Periods)

User Interaction - Use Keyboards, Input Controls, Alerts, and Pickers, Options Menu and Radio Buttons, Tab Navigation, Create a Recycler View.

Text Books :	1. Windows Azure Technical Documentation Library-MSDN-Microsoft. (msdn.microsoft.com/en-us/library/windowsazure)

	2. “Building ASP.NET Web Pages with Microsoft WebMatrix”, Steve Lydford, Apress. 3. “Introducing Microsoft WebMatrix”, Laurence Moroney, Microsoft Press 4. “Windows Azure Step by Step”, Roberto Brunetti, Microsoft Press. 5. “Programming Windows Azure”, Sriram Krishnan, O'Reilly Media. 6. “Android Developer Fundamentals”, Google Developer Training Team.
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS601.1	2	3	3	3	3	3	1	3	3	3	3	3	3	3	3
14CS601.2	2	3	3	3	3	3	1	3	3	3	3	3	3	3	3
14CS601.3	2	3	3	3	3	3	1	3	3	3	3	3	3	3	3
14CS601.4	2	3	3	3	3	3	1	3	3	3	3	3	3	3	3

NATURAL LANGUAGE PROCESSING

ELECTIVE - II

III B.Tech – VI Semester (Code: 14CS606(A))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: ATFL, Communicative English

Course Outcomes: Students will be able to:

14CS606(A).1	Understand the overview of NLP Techniques and Modeling the languages based on their grammars.
14CS606(A).2	Get deep understanding of NLP at word level and structural level
14CS606(A).3	Understand intricate details of language at semantic level and discourse level
14CS606(A).4	Gain Knowledge on Natural Language generators and Machine Translation Techniques.

UNIT-1 (13 Periods)

Introduction to NLP, Origins of NLP, Language and Knowledge, Challenges of NLP, Language and Grammar, Processing Indian Languages, NLP Applications, Successful Early NLP Systems, Information Retrieval, **Language Modelling**-Introduction, Various Grammar-based Language Models, Statistical Language Model.

UNIT-2 (13 Periods)

Word Level Analysis- Introduction, Regular Expressions, Finite-State Automata, Morphological Parsing, Collaboration Diagrams, Spelling Error Detection and Correction, Words and Word Classes, Parts-of-Speech Tagging, **Syntactic Analysis**-Introduction, Context-Free Grammar, Constituency, Parsing, Probabilistic Parsing

UNIT-3 (12 Periods)

Semantic Analysis-Introduction, Meaning Representation, Lexical Semantics, Ambiguity, Word Sense Disambiguation, **Discourse Parsing**-Introduction, Cohesion, Reference Resolution, Discourse Coherence and Structure

UNIT-4 (12 Periods)

Natural Language Generation-Introduction, Architectures of NLP Systems, Generation Tasks and Representations, Applications of NLG, **Machine Translation**-Introduction, Problems in Machine Translation, Characteristics of Indian Languages, Machine Translation Approaches, Direct Machine Translation, Rule Based Machine Translation, Corpus-based Machine Translation, Semantic or Knowledge-based MT systems, Translation involving Indian Languages

Text Books :

1. Natural Language Processing and Information Retrieval– Tanveer Siddiqui, U.S. Tiwary, Oxford Higher Education.

References :

1. Python Natural Language Processing – Jalaj Thanaki
2. Foundations of Statistical Natural Language Processing – Christopher

	Manning, Hinrich 3. Schutze, MIT Press. 4. Artificial Intelligence, Elaine Rich and Kevin Knight, Second Edition, Tata McGraw Hill.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS606(A).1	3	3	2	3	-	-	-	2	1	2	-	-	-	3	3
14CS606(A).2	2	3	2	2	-	-	1	1	2	2	-	-	-	3	3
14CS606(A).3	2	2	3	3	-	-	2	2	2	2	-	-	-	2	2
14CS606(A).4	3	3	3	3	-	-	1	3	2	2	-	-	-	3	3

PARALLEL PROCESSING

ELECTIVE - II

III B.Tech – VI Semester (Code: 14CS606(B))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS606(B).1	Understand the basic concepts, programmability issues, and dependency analysis
14CS606(B).2	Understand shared memory programming, parallel machine algorithms and message passing techniques
14CS606(B).3	Understand parallel programming languages, debugging techniques and memory IO subsystems
14CS606(B).4	Understand parallel paradigms and performance of parallel processors

UNIT-1 (13 Periods)

Introduction: Parallel Processing Architecture: Parallelism in sequential machines, Abstract model of parallel computer, Multiprocessor Architecture, Pipelining, Array Processors.

Programmability Issues: An overview, Operating System Support, Types of operating Systems, Parallel Programming Model, Software Tools.

Data Dependency Analysis: Types of Dependencies, Loop and Array Dependencies, Loop Dependency Analysis, Solving Diophantine equations, Program Transformations.

UNIT-2 (13 Periods)

Shared Memory Programming: General model of shared memory programming, Process model under UNIX.

Algorithms for Parallel Machines: Speed-up, Complexity and Cost, Histogram Computation, Parallel Reduction, Quadrature Problem, Matrix Multiplication, Parallel Sorting Algorithms, Solving Linear Systems, Probabilistic Algorithms.

Message Passing Programming: Introduction, Model, Interface, Circuit Satisifiability, Introducing Collective, Benchmarking Parallel Performance.

UNIT-3 (12 Periods)

Parallel Programming Languages: Fortran90, nCUBE C, Occam, n-Linda.

Debugging Parallel Programs: Debugging Techniques, Debugging Message Passing Parallel Programs, Debugging Shared Memory Parallel Programs.

Memory and I/O Subsystems: Hierarchical Memory Structure, Virtual Memory System, Memory Allocation and Management, Cache Allocation and Management, Cache Memories and Management, Input Output Systems.

UNIT-4 (12 Periods)

Other Parallelism Paradigms: Dataflow Computing, Systolic Architectures, Functional and Logic Paradigms, Distributed Shared Memory.

Performance of Parallel Processors: Speed-up and Efficiency, Amdahl's Law, Gustafson-Barsis.s Law, Karf-Flatt Matrix, Isoefficiency Matrix.

Text Books :	1. Hawang Kai and Briggs F.A, "Computer Architecture and Parallel Processing", McGraw Hill. 2. Jordon H.F. and Alaghaband G., "Fundamentals of Parallel Processing". 3. M.J. Quinn, "Parallel Processing", TMH.
References :	1. Shasikumar M., "Introduction to Parallel Processing", PHI. 2. Wilson G.V., "Practical Parallel Programming", PHI. 3. Singh, A.Gupta, "Parallel Computer Architecture", Morgan Kaufman

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS606(B).1	1	3	2	-	-	-	-	-	-	-	-	-	2	-	-
14CS606(B).2	1	2	1	-	-	-	-	-	-	-	-	-	3	-	-
14CS606(B).3	2	2	1	-	-	-	-	-	-	-	-	-	3	-	-
14CS606(B).4	2	3	1	-	-	-	-	-	-	-	-	-	2	-	-

DIGITAL IMAGE PROCESSING

ELECTIVE - II

III B.Tech – VI Semester (Code: 14CS606(C))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS606(C).1	The fundamentals of digital image processing
14CS606(C).2	Image enhancement techniques used in digital image processing
14CS606(C).3	Image restoration techniques and methods used in digital image processing
14CS606(C).4	Image compression and Segmentation used in digital image processing

UNIT-1 (13 Periods)

Introduction: Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System.

Digital Image Fundamentals: Elements of Visual Perception, Image Sensing and Acquisition, Image Sampling and Quantization, Some basic Relationships between Pixels

UNIT-2 (13 Periods)

Image Enhancement in The Spatial Domain: Some Basic Gray Level Transformation, Histogram Processing, Enhancement using Arithmetic/ Logic Operations, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.

Image Enhancement in The Frequency Domain: Introduction to the Fourier Transform, and The Frequency Domain, Smoothing Frequency Domain Filters, Sharpening Frequency Domain Filters, Homomorphic Filtering, Implementation.

UNIT-3 (12 Periods)

Image Restoration: A Model of the Image Degradation/Restoration Process, Linear, Position –Invariant Degradations, Inverse Filtering, Minimum Mean Square Error(Wiener) Filtering, Constrained Least Squares Filtering.

Wavelets and Multiresolution Processing: Multiresolution Expansions, Wavelet Transforms in One Dimension, The Fast Wavelet Transform, Wavelet Transforms in Two-Dimensions.

UNIT-4 (12 Periods)

Image Compression: Image Compression Models, Error Free Compression, Lossy Compression, Image Compression Standards.

Image Segmentation: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region Based Segmentation.

Text Books :

1. Rafael C. Gonzalez, Richard E. Woods, 'Digital Image Processing' Addison Wesley Pubs (Second Edition)

References :	1. Milan Sonka, Vaclav Hlavac, Roger Boyle Image Processing. Analysis, and Machine Vision (Second Edition). 2. A.K.Jain, 'Fundamentals of Digital Image Processing' PHI. 3. Philips, 'Image Processing in C', BPB Publications.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS606(C).1	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-
14CS606(C).2	3	-	-	2	-	-	-	-	-	-	-	-	-	-	-
14CS606(C).3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
14CS606(C).4	2	-	-	3	-	-	-	-	-	-	-	-	-	-	-

ADVANCED COMPUTER ARCHITECTURE

ELECTIVE - II

III B.Tech – VI Semester (Code: 14CS606(D))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Computer Organization (14CS403)

Course Outcomes: Students will be able to:

14CS606(D).1	Know the parallel models like Multiprocessors, Multi computers, Multi vector and SIMD computers. Know the concepts like dependencies, parallelism, flow mechanisms, partitioning and scheduling of programs. Know the different system interconnect architectures.
14CS606(D).2	Understand the speedup performance laws, metrics and measures and pipelining.
14CS606(D).3	Understand the different mechanisms in Multi processors systems and Scalable, Multithreaded, and Data flow architectures.
14CS606(D).4	Understand different parallel models, Languages and Compilers.

UNIT-1 (13 Periods)

Parallel Computer Models: The state of computing, Classification of parallel computers, Multiprocessors and Multi computers, Multi vector and SIMD computers.

Program and network properties: Conditions of parallelism, Data and resource Dependences, Hardware and Software parallelism, Program partitioning and scheduling, Grain Size and latency, Program flow mechanisms, Control flow versus data flow, Data flow Architecture, Demand driven mechanisms, Comparisons of flow mechanisms.

System Interconnect Architectures: Network properties and routing, Static interconnection Networks, Dynamic interconnection Networks, Hierarchical bus systems, Crossbar switch and multi-port memory, Multistage and combining network.

UNIT-2 (13 Periods)

Principles of Scalable Performance: Performance Metrics and Measures, Parallel Processing Applications. Speedup Performance Laws - Amdahl's law for fixed load, Gustafson's law for scaled problems, Memory Bounded Speedup Model.

Pipelining: Linear pipeline processor, nonlinear pipeline processor, Instruction pipeline Design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch Handling techniques, branch prediction, Arithmetic Pipeline Design, Computer Arithmetic principles, Static Arithmetic pipeline, Multifunctional arithmetic pipelines.

UNIT-3 (12 Periods)

MULTI Processors: Multiprocessor System Interconnect, Cache Coherence and Synchronization Mechanisms, Message-passing Mechanism.

Scalable, Multi-Threaded and Dataflow Architectures: Latency-Hiding Techniques, Principles

of Multithreading, Scalable and Multithreaded Architectures.

UNIT-4	(12 Periods)

Parallel Models, Languages and Compilers: Parallel Programming Models, Parallel Languages and Compilers, Dependence analysis of Data Arrays, code optimization and Scheduling, Loop parallelization and pipelining.

Text Books :	1. Kai Hwang, "Advanced Computer Architecture", TMH.
References :	1. D.A. Patterson and J.L.Hennessey, "Computer organization and Design", MorganKaufmann, 2nd Edition. 2. V.Rajaram&C.S.R.Murthy, "Parallel Computer", PHI. 3. Barry Wilkinson and Michael Allen, "Parallel Programming", Pearson Education.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS606(D).1	3	3	3	3	-	-	-	-	-	-	-	2	3	2	3
14CS606(D).2	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
14CS606(D).3	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3
14CS606(D).4	-	2	-	-	-	-	-	-	-	-	-	2	-	-	2

INTRODUCTION TO DATA ANALYTICS LAB

III B.Tech – VI Semester (Code: 14CSL601)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Database Management Systems (14CS504)

Course Outcomes: Students will be able to:

14CSL601.1	Understand the use of R, Basics of R, Advanced Data Structures, Reading Data into R
14CSL601.2	Understand the basic & advanced data management, manipulate data using SQL statements and virtualization of data using different plots
14CSL601.3	Understand the Normal distribution, binomial distribution, correlation and covariance, T-test, ANOVA, Manipulating Strings, Linear Models
14CSL601.4	Understand the Cluster Analysis and Classification

LIST OF EXPERIMENTS

1. a). Write R Code using R as a calculator.
   b). Write R Code on Vector Operation.
   c). Write R code which demonstrate i) Array ii) List iii) Matrix iv) stack v) Data Frames
2. Write R Code to Importing & Exporting data from i) CSV file ii) Excel file
3. Write R Code Which Demonstrate i) Missing Value Treatment ii) Outliers
4. Write R code which demonstrate i) Missing Values ii) Date Values iii) Type Conversion
5. Write R code to demonstrate character functions
6. Write R code which demonstrate functions and control loops
7. Write R code which demonstrate SQL operations using R
8. Write R code which demonstrate plotting of graphs i) Histogram ii) Pie Graph iii) Plot Graph iv) Box Plot v) Dot Plot vi) Kernel Density Plots
9. Write R code which demonstrate statistics functions i) Mean ii) Median iii) Range iv) Variance v) Co variance
10. Write R Code which demonstrate i) Normal Distribution ii) Binomial Distribution
11. Write R code which demonstrates Linear Regression.
12. Write R code which demonstrate i) T-Test ii) ANOVA test
13. Write R code which demonstrates string operations
14. Write R code for cluster analysis on IRIS data set using i) Hierarchical Clustering ii) Partitioning Clustering (K-Means, K-medoids)
15. Write R code for classification on IRIS data set using i) Decision trees ii) Random Forest iii) Support vector machines

Text Books :	1. R for Every One, Advanced analytics and graphics by Jared P Lander, Addison Wisley Data and analytics series. (UNIT-I, III) 2. R in Action, Data Analysis and graphics with R,Robert L Kabacoff, Manning Publisher (UNIT-II, IV)

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL601.1	3	2	-	-	-	-	-	-	-	1	-	2	1	2	1
14CSL601.2	1	3	1	2	1	2	-	-	-	3	-	2	2	3	2
14CSL601.3	3	2	2	2	3	2	-	-	-	1	-	2	2	3	3
14CSL601.4	2	2	2	2	2	2	-	-	-	1	-	2	2	3	2

ENTERPRISE PROGRAMMING-II LAB

III B.Tech – VI Semester (Code: 14CSL602)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: GUI PROGRAMMING (14CS405), WEB TECHNOLOGIES (14CS406)

Course Outcomes: Students will be able to:

14CSL602.1	Upon completion, students should be able to program a client/server enterprise application using the JEE framework.
14CSL602.2	
14CSL602.3	
14CSL602.4	

LIST OF EXPERIMENTS

1. Write a JDBC application to implement DDL and DML commands.
2. Write an application to demonstrate HTTP Servlets.
3. Write an application to demonstrate cookie & Sessions.
4. Write an application to integrate JSP & Servlets.
5. Write an application to implement Photo Album using JSP.
6. Create a Photo application using JSF.
7. Write an application to demonstrate web service.
8. Write a chat application using Web sockets.
9. Write an application to demonstrate Session Bean and Entity Bean (persistence).
10. Write an application to demonstrate Asynchronous and Timer services of Enterprise Bean.

Text Books : 1. Dr. Danny Coward, “Java EE 7: The Big Picture”, oracle press

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL602.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CSL602.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CSL602.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CSL602.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CLOUD AND MOBILE APPLICATION DEVELOPMENT LAB

III B.Tech – VI Semester (Code: 14CSL603)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Object Oriented Programming Lab (14CSL303), Enterprise Programming-I Lab (14CSL503)

Course Outcomes: Students will be able to:

14CSL603.1	Understand the Cloud infrastructure, design and develop solutions to social issues and Engineering Problems using Azure services.
14CSL603.2	Understand the Android platform, design and develop Applications related to social, health and various real world issues using Android platform.
14CSL603.3	
14CSL603.4	

LIST OF EXPERIMENTS

1. Design Cloud Service with WebRole to demonstrate Windows Azure Blob Storage.
2. Design Cloud Service with WebRole to demonstrate Windows Azure Table Storage.
3. Design Cloud Service with WebRole and WorkerRole to demonstrate Windows Azure Queue Storage.
4. Design Cloud Service (or) C# Console Application to access Azure SQL.
5. Write C# Console Application to implement Service Bus Relayed Messaging.
6. Write C# Console Application to implement Service Bus Brokered Messaging using Queues.
7. Write C# Console Application to implement Service Bus Brokered Messaging using Topics.
8. Design an android application to create interactive User Interface.
9. Design an android application to create and start activities.
10. Design an android application to demonstrate Implicit Intents.
11. Design an android application to demonstrate Options Menu and Radio Buttons.
12. Design an android application to demonstrate Recycler View.

Text Books :

1. Windows Azure Technical Documentation Library-MSDN-Microsoft. (msdn.microsoft.com/en-us/library/windowsazure)
2. "Building ASP.NET Web Pages with Microsoft WebMatrix", Steve Lydford, Apress.
3. "Introducing Microsoft WebMatrix", Laurence Moroney, Microsoft

	Press 4. “Windows Azure Step by Step”, Roberto Brunetti, Microsoft Press. 5. “Programming Windows Azure”, Sriram Krishnan, O'Reilly Media. 6. “Android Developer Fundamentals”, Google Developer Training Team.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL601.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CSL601.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CSL601.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14CSL601.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

INTRODUCTION TO CYBER SECURITY IV B.Tech – VII Semester (Code: 14CS701)					
Lectures	:	4Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Operating Systems (14CS304), Computer Networks (14CS603)

Course Outcomes: Students will be able to:

14CS701.1	Understanding open source operating systems like kali Linux and understand the concept of Encryption and Decryption techniques.
14CS701.2	Understand the concept of Information gathering tools and understanding the concept of meterpreter shell commands.
14CS701.3	Understand the concepts of web site attack techniques and understanding the concepts of Viruses, spywares and password attacks..
14CS701.4	Understand the concepts of Browser securities and IDS & IPS.

UNIT-1 (16 Periods)

Introduction to Cryptography & Network Security: Introduction, Cryptography, Cryptanalysis, Cryptology, Security goals, Types of Security, Basic Concepts of Security, Types of Keys, **OSI Security Architecture**: Security attacks, Security mechanisms, Security services.
Classical Encryption Techniques: Substitution Cipher: Mono alphabetic Cipher (Additive Cipher, Shift Cipher, Caesar Cipher, Multiplicative Cipher, Affine Cipher) **Poly Alphabetic Cipher** (Play fair Cipher). **Transposition Cipher.**
Installing & Basic Over View: Installing kali with VM ware player, Updating kali, Installing VM ware Tools for Linux, Installing metasploit table 2, Installing Windows OS.

UNIT-2 (15 Periods)

Metasploit Tutorial: Introduction to metasploit: Metasploit overview, Picking an exploit, Setting exploit options, Multiple Target types, Picking a payload, Setting payload options, Running the exploit.
Meterpreter Shell: Basic Meterpreter Commands, Core commands, File system Commands, Network Commands, System Commands, Capturing Webcam Video, Screen shots.
Information Gathering & Mapping: Recon Tool, Dmitry, netdiscover, nmap, Zenmap, Nessus.
Shodan: Why scan network with shodan, Filter guide, Filter commands, Combined searches, shodan searches with metasploit,

UNIT-3 (15 Periods)

Viruses, malware, Trojan, Types **of cyber security attacks:** malware, phishing, SQL injection attack(sqlmap.sqlDict), cross-site scripting, denial of service, session hijacking and man-in-themiddle attacks. **Web application hijacking tools-** Burp suite, OWASPZAP.
Password attacks: Introduction, online password attacks, cracking HTTP passwords, Cracking simple LM hashes, pass the hash , mimikataz plain text passwords, mimikatz and utilman, keyscan and lockout_keylogger,

UNIT-4 (14 Periods)

Web based password cracking Techniques: Introduction, Authentication Techniques, password cracking: definition, password cracking techniques.

Hacking Web-Browsers: Introduction, Firefox security, Internet explorer security, Hacking Internet explorer. **Troubleshooting and configuring of network devices**: Firewalls-what is firewall, packet, traffic, protocol, port, tool: IPtables (rules), IDS and IPS: what is IDS and IPS, installation procedure for snort, snort rules.

Text Books :	1. Cryptography and network security -Behrouz A. Forouzan 2. Basic Security Testing with Kali Linux -Daniel W. Dieterle
References :	1. hacking exposed web applications - JOEL SCAMBRAY MIKE SHEMA

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS701.1	3			3		3									3
14CS701.2			3		3									3	
14CS701.3					3								3		
14CS701.4					3							3	3		

OBJECT ORIENTED ANALYSIS AND DESIGN

IV B.Tech – VII Semester (Code: 14CS702)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Object Oriented Programming (14CS306), Software Engineering (14CS501)

Course Outcomes: Students will be able to:

14CS702.1	Understand the Object Oriented Concepts, Gathering and Analyzing the requirements for any Object Oriented software projects.
14CS702.2	Capability to Specifying operations and specifying the control of an Information System.
14CS702.3	Understand the System Design and apply various Design Patterns for Object Oriented software projects.
14CS702.4	Understand the Implementation of Object Oriented software projects.

UNIT-1 (13 Periods)

What is Object-Orientation: Basic Concepts, The Origins of Object Orientation, Object-Oriented Languages today;
Agate Ltd Case Study: Introduction to Agate Ltd.
Modeling Concepts: Models and diagrams, Drawing Activity Diagrams, A Development Process;
Requirements Capture: User Requirements, Fact Finding Techniques, User Involvement, Documenting Requirements, Use Cases, Requirements Capture and Modelling;
Agate Ltd Case study: Requirements Model.
Requirements Analysis: What Must a Requirements Model Do? Use Case Realization, The Class Diagram, drawing a Class Diagram, CRC Cards, Assembling the Analysis Class Diagram.
Agate Ltd Case study - Requirements Analysis.

UNIT-2 (13 Periods)

Refining the Requirements Model: Component based development, adding further structure, Software development patterns.
Object Interaction: Object Interaction and Collaboration, Interaction Sequence Diagrams, Collaboration Diagrams, Model Consistency;
Specifying Operations: The Role of Operation Specifications, Contracts, Describing Operation Logic, Object Constraint Language, Creating an Operation Specification;
Specifying Control: States and Events, Basic Notation, Further Notation, preparing a State chart, Consistency Checking, Qualify Guidelines;
Agate Ltd Case study - Further Analysis

UNIT-3 (12 Periods)

Moving into Design: How is Design Different from Analysis? Logical and Physical Design, System Design and Detailed Design, Qualities and objectives of Analysis and Design, Measurable Objectives in Design, Planning for Design.
System Design: The Major Elements of System Design, Software Architecture. Concurrency, Processor Allocation, Data Management Issues, Development Standards, Prioritizing Design Trade-offs, Design for Implementation;

Object Design: Class Specification, Interfaces, Criteria for Good Design, Designing Associations, Integrity Constraints, Designing Operations, Normalization;
Design Patterns: Software Development Patterns, Documenting Patterns-Pattern Templates, Design Patterns, how to Use Design Patterns, Benefits and Dangers of Using Patterns;
Human-Computer Interaction: The User Interface, Approaches to User Interface Design, Standards and legal Requirements

UNIT-4	(12 Periods)

Designing Boundary Classes: The Architecture of the Presentation Layer, Prototyping the User Interface, Designing Classes, Designing Interaction with Sequence Diagrams, The Class Diagram Revisited, User Interface Design Patterns, Modelling the Interface Using Statecharts; Agate Ltd Case Study –Design.
Implementation: Software Implementation, Component Diagrams, Development Diagrams, Software Testing, Data Conversion, User Documentation and Training, Implementation Strategies, Review and Maintenance;
Reusable Components: Why Reuse?, Planning a Strategy for Reuse, Commercially Available component ware;

Text Books :	1. "Object-Oriented Systems Analysis And Design Using UML", Simon Bennett, Steve Mc Robb and Ray Farmer, Tata McGraw-Hill Edition, Second Edition.
References :	1. James Rumbaugh, Jacobson, Booch, "Unified Modeling Language Reference Manual", PHI. 2. Jacobson et al., "The Unified Software Development Process", AW, 1999. 3. AtulKahate, "Object Oriented Analysis &Design", The McGraw-Hill Companies, 2004.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS702.1	1	2		2					2	1	1	1		2	
14CS702.2	2	2	2	2					1	1	1		1	2	
14CS702.3	1		2		3				1	1	1		2		2
14CS702.4	2	2	2	1	2				3	2	2			3	1

ADVANCED DATA ANAYTICS IV B.Tech – VII Semester (Code: 14CS703)					
Lectures	:	4Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Database Management Systems(14CS505), GUI Programming(14CS405)

Course Outcomes: Students will be able to:

14CS703.1	Understand different types of Data & processing
14CS703.2	Understand the Current technologies of BIG DATA
14CS703.3	Understand the concepts of Hadoop Ecosystem.
14CS703.4	Understand & Need to work practically on different types of Data using Hadoop Ecosystem

UNIT-1 (16 Periods)

Big Data Analytics: Introduction to Big Data Analytics, Characteristics of Big Data, Sources of Big Data, Applications of Big Data

HADOOP: Introduction to Hadoop, Hadoop components, Configuration of Hadoop.

The Hadoop Distributed File System-The design of HDFS, HDFS concepts, The command line interpreter, Basic File system operations, Hadoop file system, interfaces Data flow, parallel copying with distcp.

UNIT-2 (15 Periods)

YARN-Anatomy of YARN application run, YARN compared to Map Reduce 1, Scheduling in YARN.

How Map Reduce Works-Anatomy of Map Reduce job run, Failures, Shuffle and sort, Task execution.

Map Reduce Features-Counters, sorting, joins side data distribution, writing map reduce programs, deploying map reduce programs on Hadoop Cluster.

UNIT-3 (15 Periods)

Installing and Running Pig-Execution Types, Running Pig Programs, Grunt, Pig Latin Editors, An Example, Comparison with Databases,Pig Latin-Structure, Statements, Expressions, Types, Schemas, Functions, Macros, User-Defined Functions-A Filter UDF, An Eval UDF, Data Processing Operators- Loading and Storing Data, Filtering Data, Grouping and Joining Data, Sorting Data, Combining and Splitting DataPig in Practice-Parallelism, Anonymous Relations, Parameter Substitution.

Installing Hive, The Hive Shell, An example, Running Hive, Configuring Hive, Hive Services, The Metastore, Comparison with traditional databases, Schema on Read versus Schema on Write, Update, transactions and Indexes, SQL on Hadoop alternatives, HiveQL, Data types, Operators and functions, Tables, Querying Data-sorting and aggregating, MapReduce Script, joins, Sub queries, Views.

UNIT-4 (14 Periods)

Spark: Installing spark, an example spark application, jobs, stages, tasks, a scalastand alone application, anatomy of spark job run, job submission, DAG construction, task scheduling, task execution, execution cluster managers, spark on YARN.

Sqoop: Getting Sqoop, Sqoop Connectors, A Sample Import, Text and Binary File Formats, Generated Code, Additional Serialization Systems, Imports: A Deeper Look, Controlling the Import, Imports and Consistency.	
Text Books :	1. HADOOP "The Definitive Guide", Tom White, O'Reilly Publications, 4th Edition.
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS703.1	2	2		2			3			3			3	2	3
14CS703.2		2	2		3	3			3		2		2	2	
14CS703.3	3	2	3			2		2		2			3		3
14CS703.4	2	1	1		3	3		3		3			3		3

WIRELESS NETWORKS

IV B.Tech – VII Semester (Code: 14CS704)

Lectures	:	4 Periods/week, Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Computer Networks (14CS603)

Course Outcomes: Students will be able to:

14CS704.1	Understand history, reference model of communication, properties of wireless transmission and different medium access control mechanisms.
14CS704.2	Understand architecture of different telecommunication systems and satellite systems.
14CS704.3	Understand architecture and layers of wireless local area networks and network layer for wireless environment.
14CS704.4	Understand routing protocols for mobile ad-hoc networks, transport layer for wireless networks and architecture of wireless application protocol.

UNIT-1 (16 Periods)

Introduction: Applications, Short History of Wireless Communications, Simplified Reference Model.

Wireless Transmission: Frequencies, Signals, Signal Propagation, Multiplexing, Modulation, Spread Spectrum, and Cellular Systems.

Medium Access Control: Motivation for a Specialized MAC, SDMA, FDMA, TDMA, CDMA, and Comparison.

UNIT-2 (15 Periods)

Telecommunication Systems: GSM, DECT, TETRA, UMTS and IMT-2000: System Architecture, and Radio Interface.

Satellite Systems: History, Applications, Basics, Routing, Localization, and Handover.

UNIT-3 (15 Periods)

Wireless LAN: Infrared Vs. Radio Transmission, Infrastructure and Ad Hoc Networks, IEEE 802.11: System Architecture, Protocol Architecture, Physical Layer, MAC Layer, and MAC Management.

Mobile Network Layer: Mobile IP: Entities and Terminology, IP packet delivery, Agent discovery, Registration, and Tunneling and Encapsulation, Dynamic Host Configuration Protocol.

UNIT-4 (14 Periods)

Mobile Network Layer: Ad Hoc Networks.

Mobile Transport Layer: Traditional TCP, Classical TCP Improvements: Indirect TCP, Snooping TCP, Mobile TCP, Fast Retransmit / Fast Recovery, Transmission / Time-Out Freezing, Selective Retransmission, and Transaction Oriented TCP.

Support for Mobility: Wireless Application Protocol: Architecture, Wireless Datagram Protocol, Wireless Transport Layer Security, Wireless Transaction Protocol, Wireless Session protocol, and Wireless Application Environment.

Text Books :	1. J.Schiller, “Mobile communications”, Addison-Wesley, 2003
References :	1. William Stallings, “Wireless Communication Networks”, 2. UWE Hansmann, Lother Merk, Martin S.Nicklous, Thomas Stober, “Principles of Mobile Computing”, 2nd Edition.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS704.1	3	3	3	3								3			
14CS704.2	3		2												
14CS704.3		3		3								2			
14CS704.4			2									3			

SOFTWARE PROJECT MANAGEMENT

ELECTIVE - III

IV B.Tech – VII Semester (Code: 14CS705(A))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Software Engineering (14CS501)

Course Outcomes: Students will be able to:

14CS705(A).1	Understand the principles and different between conventional software management and modern software management and improving software economics.
14CS705(A).2	Understand different life cycle phases and artifacts and different software architectures and different workflows of the process.
14CS705(A).3	Understand the concepts of milestones and project organization responsibilities and process automation.
14CS705(A).4	Understand the concepts of different types of metrics and indicators and future software project management.

UNIT-1 (13 Periods)

Conventional Software Management: The waterfall model, conventional software Management performance.

Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT-2 (13 Periods)

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.

Work Flows of the process: Software process workflows, Iteration workflows.

UNIT-3 (12 Periods)

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration 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-4 (12 Periods)

Project Control and Process instrumentation: The seven core Metrics, Management

indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process: Process discriminants.

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, 2005.
References :	1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition. 2. Software Project Management, Joel Henry, Pearson Education. 3. Software Project Management in practice, Pankaj Jalote, Pearson Education.2002

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS705(A).1	1			1	2		1		1	2	3		1	1	
14CS705(A).2	1			1	2		1		1	2	3		1	1	
14CS705(A).3	1			1	2		1		1	2	3		1	1	
14CS705(A).4	1			1	2		1		1	2	3		1	1	

DISTRIBUTED SYSTEMS

ELECTIVE - III

IV B.Tech – VII Semester (Code: 14CS705(B))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Operating Systems, Computer Networks

Course Outcomes: Students will be able to:

14CS705(B).1	Understand what a Distributed System is, why one would design a system as a distributed system, and what are the desired properties of such systems.
14CS705(B).2	List the principles underlying the functioning of Distributed systems
14CS705(B).3	Design a Distributed system that fulfills requirements with regards to key distributed systems properties (such as scalability, transparency, etc).
14CS705(B).4	Build distributed system software using basic os mechanisms as well as higher-level middleware and languages.

UNIT-1 (13 Periods)

Introduction: Definition of a Distributed System, Goals, Hardware Concepts, Software Concepts, the Client-Server Model.

Communication: Remote Procedure Call- Basic RPC Operation, Parameter Passing, Extended RPC Models, Remote Object Invocation - Distributed Objects, binding a Client to an Object, Static versus Dynamic Remote Method Invocations, Parameter Passing.

Message-Oriented Communication: Persistence and Synchronicity in Communication, Message Oriented Transient and Persistent Communication.

UNIT-2 (13 Periods)

Processes: Threads, Clients, Servers, Code Migration.

Naming: Naming Entities -Names, Identifiers and Addresses, Name Resolution, the Implementation of a Name Space. Locating Mobile Entities, Removing Unreferenced Entities.

UNIT-3 (12 Periods)

Synchronization: Clock Synchronization, Logical Clocks, Election Algorithms, Mutual Exclusion.

Consistency and Replication: Introduction, Data- Centric Consistency Models, Client –Centric Consistency Models, Distribution Protocols, Consistency Protocols.

UNIT-4 (12 Periods)

Fault tolerance: Introduction to Fault Tolerance, Process Resilence, Reliable Client Server Communication, Reliable Group Communication, Distributed Commit.

Distributed File Systems: Sun Network File System, The Coda File System.

Text Books :

1. Andrew S.Tanenbaum, Maarten Van Steen, “Distributed Systems: Principles and Paradigms”, 2002, Pearson Education/PHI.

References :	1. Coulouris, Dollimore, Kindberg, “Distributed Systems-Concepts and Design”, 3rd edition, Pearson Education. 2. Mukesh, Singhal & Niranjan G. Shivarathri, “Advanced Concepts in Operating Systems”, TMH. 3. Sinha, “Distributed Operating System – Concepts and Design”, PHI.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS705(B).1	2	3	-	3	-	-	-	-	3	1	2	1	-	3	-
14CS705(B).2	3	3	3	3	-	-	-	-	2	2	2	-	2	3	-
14CS705(B).3	2	-	3	-	3	-	-	-	2	2	2	-	3	-	3
14CS705(B).4	2	2	2	2	2	-	-	-	3	2	2	-	-	3	2

E COMMERCE

ELECTIVE - III

IV B.Tech – VII Semester (Code: 14CS705(C))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS705(C).1	Attain overview of how e-commerce applications and process models are build.
14CS705(C).2	Able to organize commercial applications.
14CS705(C).3	Understand vulnerabilities and provide security.
14CS705(C).4	Able to automate and optimize the processes.

UNIT-1 (13 Periods)

INTRODUCTION: History of E-Commerce–Overview of E-Commerce framework, E-Business models–Network infrastructure, Role of Internet – E-commerce and World wide Web.
E COMMERCE: Consumer oriented E-Commerce applications, mercantile process models, Electronic Payment Systems; Digital Token based EPS, Smart cards, Credit cards, Risks, designing EPS.

UNIT-2 (13 Periods)

ORGANIZATIONAL COMMERCE AND EDI: Electronic Data Interchange, EDI applications in Business, EDI and E-Commerce, EDI standardization and implementation, Internet based EDI.

UNIT-3 (12 Periods)

SECURITY: Internet security standards, Secure electronic payment protocols, Cryptography and authentication, Security issues, Encryption techniques, E-Commerce payment mechanisms, SET protocol, Electronic check, Electronic cash, E-Commerce ethics, Regulations and social responsibility.

UNIT-4 (12 Periods)

INTELLIGENT AGENTS: Definition and capabilities, Limitation of agents, Security, Web based marketing, Search engines and Directory registration, online advertisements, Portables and info mechanics, Website design issues.

Text Books :

1. Ravi Kalakota and Andrew B Whinston,“Frontiers of Electronic Commerce”, Pearson Education Asia, 1999. (Unit- I, II, IV)
2. Marilyn Greenstein and Todd M Feinman,”Electronic commerce: Security, Risk Management and Control” Tata McGraw-Hill, 2000. (Unit-III)

References :

1. Judy Strauss and Raymond Frost, “E Marketing”, PHI, 2002
2. Brenda Kienan, “ Managing e Commerce Business” , PHI,2001
3. Vivek Sharma and Rajiv Sharma, “Developing E-Commerce Sites-an

	integrated approach" Pearson Education Asia, 2000 70 CS – 07-08-SRM – E&T

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS705(C).1	3	3	3	3								3			
14CS705(C).2	3											3			
14CS705(C).3		3		3											
14CS705(C).4				3								2			

SOFTWARE QUALITY MANAGEMENT

ELECTIVE - III

IV B.Tech – VII Semester (Code: 14CS705(D))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Software Engineering (14CS501)

Course Outcomes: Students will be able to:

14CS705(D).1	Know the fundamentals of software quality assurance and how to manage the quality of the software and techniques to prevent the defects in managing the quality of the software.
14CS705(D).2	Know the different software quality assurance metrics – Total quality management metrics and analysis of software quality metrics.
14CS705(D).3	Know the concepts of software quality program, establishment of software quality program and software quality assurance planning.
14CS705(D).4	Know the different ISO 9000 standards for software quality assurance, Capability Maturity Model and the Role of SQA in Software Development Maturity and Comparison of ISO 9000 Model with SEI's CMM.

UNIT-1 (13 Periods)

FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE The Role of SQA – SQA Plan – SQA considerations – SQA people – Quality Management – Software Configuration Management **MANAGING SOFTWARE QUALITY:** Managing Software Organizations – Managing Software Quality–Defect Prevention–Software Quality Assurance Management

UNIT-2 (13 Periods)

SOFTWARE QUALITY ASSURANCE METRICS: Software Quality – Total Quality Management (TQM) – Quality Metrics – Software Quality Metrics Analysis.

UNIT-3 (12 Periods)

SOFTWARE QUALITY PROGRAM Software Quality Program Concepts – Establishment of a Software Quality Program –Software Quality Assurance Planning – An Overview – Purpose & Scope.

UNIT-4 (12 Periods)

SOFTWARE QUALITY ASSURANCE STANDARDIZATION: Software Standards–ISO 9000 Quality System Standards - Capability Maturity Model and the Role of SQA in Software Development Maturity – SEI CMM Level 5 – Comparison of ISO 9000 Model with SEI's CMM.

Text Books :	1. Watts S Humphrey, "Managing the Software Process", Pearson Education Inc. (UNIT I and II) 2. Mordechai Ben-Menachem / Garry S Marliss, "Software Quality", Vikas Publishing House, Pvt, Ltd., New Delhi.(UNIT III to IV)
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping															
	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS705(D).1	1	-	-	1	2	-	1	-	-	2	1	-	1	1	-
14CS705(D).2	1	-	-	1	2	-	1	-	-	2	1	-	1	1	-
14CS705(D).3	1	-	-	1	2	-	1	-	-	2	1	-	1	1	-
14CS705(D).4	1	-	-	1	2	-	1	-	-	2	1	-	1	1	-

DATABASE MANAGEMENT SYSTEMS

OPEN ELECTIVE

IV B.Tech – VII Semester (Code: 14OE706/CS01)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14OE706/CS01.1	Familiarize with fundamental concepts of database and various database architectures and Design relations for Relational databases using conceptual data modeling.
14OE706/CS01.2	Implement formal relational operations in relational algebra and SQL.
14OE706/CS01.3	Identify the Indexing types and normalization process for relational databases
14OE706/CS01.4	Use mechanisms for the development of multi user database applications.

UNIT-1 (13 Periods)

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - When Not to Use a DBMS.

Database System Concepts and Architecture: Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems.

Data Modeling Using the Entity-Relationship (ER) Model: Using High-Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types - Refining the ER Design for the COMPANY Database - ER Diagrams, Naming Conventions, and Design Issues.

UNIT-2 (13 Periods)

The Relational Data Model and Relational Database Constraints: Relational Model Concepts - Relational Model Constraints and Relational Database Schemas - Update Operations, Transactions, and Dealing with Constraint Violations - Relational Database Design Using ER-to-Relational Mapping.

Basics of SQL: DDL, DML and DCL Commands.

UNIT-3 (12 Periods)

Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form.

Relational Database Design Algorithms and Further Dependencies: Properties of Relational Decompositions - Algorithms for Relational Database Schema Design – Multivalued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form.

UNIT-4	(12 Periods)
Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions - Characterizing Schedules Based on Recoverability - Characterizing Schedules Based on serializability. **Concurrency Control Techniques:** Two-Phase Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering – Multiversion Concurrency Control Techniques - Validation (Optimistic) Concurrency Control Techniques - Granularity of Data Items and Multiple Granularity Locking.	
Text Books :	1. "Fundamentals of Database Systems", RamezElmasri and Navate Pearson Education, 5th edition.
References :	1. "Introduction to Database Systems", C.J.Date Pearson Education. 2. "Data Base Management Systems", Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill, 3rd Edition. 3. "Data base System Concepts", Silberschatz, Korth, McGraw hill, 5th edition.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14OE706/CS01.1	3	2	3	3	-	-	-	-	-	-	-	-	3	3	3
14OE706/CS01.2	3	3	3	3	3	-	-	-	-	-	1	-	3	3	3
14OE706/CS01.3	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
14OE706/CS01.4	3	3	2	-	-	-	-	-	-	3	-	-	3	2	2

JAVA PROGRAMMING

OPEN ELECTIVE

IV B.Tech – VII Semester (Code: 14OE706/CS02)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14OE706/CS02.1	Understand the concepts of Classes and Objects, Inheritance, Interfaces and Packages.
14OE706/CS02.2	Understand the concepts of Strings, Library, Exception Handling and Multithreading.
14OE706/CS02.3	Understand the concepts of I/O Streams, Event Handling and Applets.
14OE706/CS02.4	Understand the concepts of AWT and Swings.

UNIT-1 (13 Periods)

Introduction: Introduction to java, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects : Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Inheritance: Basic concepts, access specifires, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, Object class.

Interfaces: Differences between classes and interfaces, defining an interface, implementing interface, variables in interface and extending interfaces.

Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages.

Strings: Exploring the String class, String buffer class, Command-line arguments.

UNIT-2 (13 Periods)

Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes.

Multithreading: Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities.

Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet, Color class and Graphics

UNIT-3 (12 Periods)

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menu bar.

UNIT-4 (12 Periods)

Swing-I – swings introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields,

buttons – The JButton class, Check boxes, Radio buttons.
JDBC Connectivity: Jdbc connectivity, types of Jdbc Drivers, connecting to the database, Jdbc Statements, Jdbc Exceptions, Manipulations on the database, Metadata.

Text Books :	1. "The Complete Reference Java J2SE", 7th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi. 2. "Big Java", 2nd Edition, Cay Horstmann, John Wiley and Sons, Pearson Education.
References :	1. "Java How to Program", Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI. 2. "Core Java 2", Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education. 3. "Core Java 2", Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education. 4. "Beginning in Java 2", Iver Horton, Wrox Publications. 5. "Java", Somasundaram, Jaico. 6. "Introduction to Java programming", By Y.DanielLiang, Pearson Publication

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14OE706/CS02.1	2	2	2	-	-	-	-	-	2	-	-	2	3	3	2
14OE706/CS02.2	2	2	2	-	-	-	-	-	2	-	-	2	3	3	2
14OE706/CS02.3	2	2	2	-	-	-	-	-	2	-	-	2	3	3	3
14OE706/CS02.4	2	2	2	-	-	-	-	-	2	-	-	2	3	3	3

BUSINESS COMMUNICATION AND PRESENTATION SKILLS LAB

IV B.Tech – VII Semester (Code: 14ELL701)

Lectures	:	2 Periods/Week	Continuous Assessment	:	20
Final Exam	:	3 hours	Final Exam Marks	:	30

Pre-Requisite:

Course Outcomes: Students will be able to:

14ELL701.1	To help students introduce themselves in job interviews
14ELL701.2	To promote team skills and leadership qualities in students
14ELL701.3	To enhance conversational skills of English language in the students
14ELL701.4	To enable them face job interviews effectively

UNIT-1 (6 Periods)

Identity Management Communication: Face to Face Impression Management & Mediated Communication (Self Introduction & Self-Promoting– Over Stating and under stating – Strategies to Overcome Communicative Inhibitions – Creating Positive Self-image through words - Appearance- Verbal and Non Verbal Manners) – Giving Polite Yet Assertive Responses – Responsive strategies to handle criticism - Accepting Failure and Declaring Success.

UNIT-2 (6 Periods)

Business Presentations: Oral and Power Point Presentations; Preparing Successful Presentations; Assessing Audience, Making Effective Use of Visual Aids, Delivering Presentation, Using Prompts, Handling With Questions and Interruptions, Mock Presentations.

UNIT-3 (6 Periods)

Oratory Skills: Group Discussion, Extempore, Mock Parliament and Mock Press.

UNIT-4 (6 Periods)

Interview Management: Resume Preparation, Types of Interviews, Preparing For Interviews, Facing Interviews, Handling Tough & Tricky Questions, Reviewing Performance, Participating In Mock Interviews

Text Books :	
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14ELL701.1	3	3	3	3	3					3	3	3	3	3	3
14ELL701.2		3	3	3	3	3			3	3				3	
14ELL701.3	2	2	2	2			2	2				2		2	2
14ELL701.4	2	2	2	2		2		2				2		2	2

INTRODUCTION TO CYBER SECURITY LAB

IV B.Tech – VII Semester (Code: 14CSL702)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CSL702.1	Understanding open source operating systems like kali Linux and understand the concept of Encryption and Decryption techniques.
14CSL702.2	Understand the concept of Information gathering tools and understanding the concept of meterpreter shell commands.
14CSL702.3	Understand the concepts of web site attack techniques and understanding the concepts of Viruses, spywares and password attacks..
14CSL702.4	Understand the concepts of Browser securities and IDS & IPS.

LIST OF EXPERIMENTS

1. VM-ware installation, kali, windows OS installation, metaspotiable-2 installation
2. Hacking any windows OS by using msfconsole
3. Information gathering tools-recontool, Dmitry, netdiscovery, nmap, zenmap
4. Installation procedure and usage of nessus
5. Shodan installation, Shodan Filters, shodan searches with metaspolit
6. Phising attacks with Setoolkit
7. Man-in-middle attack, malware
8. Sql-injection
9. Xssattack, denial of service attack, session hijacking
10. Burpsuit and owaspzap tool
11. Password Attacks: Simple LM hashes, Mimikatz plain text passwords, Pass the hash, Mimikatz and Utilman, Key Loggers
12. a) Online Password Cracking with hydra, xhydra
    b) Offline Password Cracking with John the ripper.
13. Hacking Internet Explorer web browser
14. Linux Firewall rules configured by Iptables
15. Snort installation and usage in
    a) Packet Sniffer mode b) Packet Logger mode c) IDS mode d) IPS mode

Text Books :

1. Cryptography and network security -Behrouz A. Forouzan
2. Basic Security Testing with Kali Linux -Daniel W. Dieterle

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL702.1	3			3		3									3
14CSL702.2			3		3									3	
14CSL702.3					3								3		
14CSL702.4					3							3	3		

ADVANCED DATA ANALYTICS LAB

IV B.Tech – VII Semester (Code: 14CSL703)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CSL703.1	Understand different types of Data & processing
14CSL703.2	Understand the Current technologies of BIG DATA
14CSL703.3	Understand the concepts of Hadoop Ecosystem.
14CSL703.4	Understand & Need to work practically on different types of Data using Hadoop Ecosystem

LIST OF EXPERIMENTS

1. Write the steps for installation of Hadoop.
2. Write a demo program on Map Reduce using Java.
3. Write HDFS command.
4. Write the steps for installation of Pig.
5. Write the word count script using pig latin.
6. Illustrate the basic pig latin concepts with help of movie dataset.
7. Write the steps for installing Hive.
8. Illustrate the creation, loading & complete select statements in Hive.
9. Write the script how data will be transfer using Sqoop.
10. Prepare the story board using Global super market dataset with the help of tableau tool.

Text Books :	
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL703.1	2	2		2			3			3			3	2	3
14CSL703.2		2	2		3	3			3		2		2	2	
14CSL703.3	3	2	3			2		2		2			3		3
14CSL703.4	2	1	1		3	3		3		3			3		3

TERM PAPER

IV B.Tech – VII Semester (Code: 14CSL704)

Lectures	:	2 Periods/Week	Continuous Assessment	:	20
Final Exam	:	3 hours	Final Exam Marks	:	30

Pre-Requisite:

Course Outcomes: Students will be able to:

14CSL704.1	Able to select a problem in the chosen area of interest, understand and analyze the selected problem
14CSL704.2	Demonstrate the knowledge gained in the relevant subject /domain
14CSL704.3	Able to improve communication and presentation skills
14CSL704.4	Able to function effectively as a member or leader in a team

It is aimed as a precursor to the project work done in the second semester of the final year B.Tech. It should help the students to identify their Research area/topic and should form the groundwork and preliminary research required for the project work. The batches formed for pursuing the project work in the final year shall select some research article published in the latest journals of IEEE, ACM and other related journals. Each batch should refer to a minimum of FIVE reference sources outside their prescribed textbooks. The batch must gain an understanding of the research tools used and the related material, available both in printed and digital formats. Each project batch must make the presentation for two rounds on the same research article about their understanding, conclusion and if possible propose the extensions for the work. Each individual of the batch must give the presentation in both the rounds.

At the end of the semester, the batch must submit a report in IEEE format, on the work they have pursued throughout the semester containing

- The aim and objective of the study.
- The Rationale behind the study.
- The work already done in the field and identified.
- Hypothesis, experimentation and discussion.
- Conclusion and further work possible
- Appendices consisting of illustrations, Tables, Graphs etc.,

Evaluation is to be done for the two presentations made and the report submitted. Method of Continuous Assessment (CA):

1.	Day to day work	5 marks
2.	Seminar – I	5 marks
3.	Term Paper Report	5 marks
4.	Seminar – II	5 marks
	TOTAL	20 marks

Final Examination (FE) shall be conducted for 60 marks by one internal and one external examiner appointed by the principal. The FE contains Viva-voce and the demonstration of the model developed or work performed as a part of the term paper.

Text Books :	
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL704.1	3	3	3	3	2	2			3	2		3	3	3	3
14CSL704.2	3			3	2					2			3		
14CSL704.3		2							2			3		3	
14CSL704.4				2		2									2

INDUSTRIAL MANAGEMENT & ENTERPRENEURSHIP DEVELOPMENT

IV B.Tech – VIII Semester (Code: 14ME801)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14ME801.1	Perceive evolution principles and functions of management and organization
14ME801.2	Understand various functions of industrial management such as Financial, Marketing and Human Resource.
14ME801.3	Develop the skills of the student in production management, including production systems, productivity, production planning and control; SQC and product, process & plant design.
14ME801.4	Inculcate the capabilities of the student to become an entrepreneur

UNIT-1 (13 Periods)

General management: Management definition, Functions of Management and Principles of Management.

Forms of Business Organization: Salient features of Sole Proprietorship, Partnership, Joint Stock Company: Private Limited and Public Limited companies; Merits and Demerits of above types

Marketing Management: Functions of Marketing, Concepts of Selling and Marketing, Marketing mix (4 Ps); Advertising and sales promotion; Product life cycle.

UNIT-2 (13 Periods)

Production Management: Types of production systems, Productivity vs. Production, Production planning and control.

Materials Management: Inventory Control, Basic EOQ model, ABC analysis.

Quality Control: Control Charts: chart, R chart, P chart, C chart, Acceptance sampling.

UNIT-3 (12 Periods)

Financial Management: Functions of finance, Types of Capital-Fixed and Working Capital, Break Even Analysis.

Depreciation- Straight line method of depreciation, declining balance method and the Sum of Years digits method of Depreciation.

Personnel Management: Functions of personnel management, human resource planning, recruitment, selection, placement, training and development and performance appraisal. Motivation theories, leadership styles

UNIT-4 (12 Periods)

Entrepreneurship Development: Introduction, Entrepreneurial characteristics, Functions of an Entrepreneur; Factors affecting entrepreneurship; Role of communication in entrepreneurship; Entrepreneurial Development-Objectives, Need of Training for enterprises; Finance for the enterprises; Product, Process and Plant Design- Product analysis and Product

Design process. Steps in process design and Plant Design.	
Text Books :	1. Industrial Engineering and Operations Management, S.K.Sharma, Savita Sharma and Tushar Sharma. 2. Industrial Engineering and Production Management, Mahajan. 3. Management Science, A.R.Aryasri
References :	1. Operations Management, Joseph G Monks. 2. Marketing Management, Philip Kotler. 3. The Essence of Small Business, Barrow colin. 4. Small Industry Ram K Vepa

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14ME801.1						3		3		3	3	3	-	-	-
14ME801.2					2				2	2	2	2	-	-	-
14ME801.3	2	2										2	-	-	-
14ME801.4				2			2		2	2	2	2	-	-	-

ADVANCED CYBER SECURITY

IV B.Tech – VIII Semester (Code: 14CS802)

Lectures	:	4 Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Introduction to cyber security (14CS701)

Course Outcomes: Students will be able to:

14CS802.1	Understand the concepts of reconnaissance and wireless networks attacks, security tools.
14CS802.2	Understanding the usage of security tools for protecting systems resources.
14CS802.3	Understand the concepts of incident response and RAM analysis.
14CS802.4	Understand the concepts of data backup and log correlation management.

UNIT-1 (16 Periods)

Footprinting and Reconnaissance: What is footprinting, footprinting objectives, tools, introduction to google hacking, nuts and bolts of google hacking, google hacking process, DNS footprinting, DNS functions and process.

Wireless Network Attacks: Wireless Security Protocols, Viewing Wireless Networks with Airmon-NG, Viewing Wi-Fi Packets and Hidden APs in Wireshark, Turning a Wireless Card into an Access Point, Using MacChanger to Change the Address (MAC) of your Wi-Fi Card Fern **WIFI Cracker**: Using FernWi-Fi Testing with WiFite: Using WiFite, More advanced attacks with **WiFiteKismet:** Scanning with Kismet, Analysing the DataEasy Creds: Installing Easy-Creds, Creating a Fake AP with SSL strip Capability, Recovering passwords from secure sessions

UNIT-2 (15 Periods)

Top web application security tools: burpsuit,Netsparker, Arachni,W3af

Antivirus: installation procedure ClamAV, procedure, **email scanner**: mail-scanner- reference, **web application security:** installation procedure mod_security-reference, mod_security-reference.

Patch management: installation procedure for MBSA

UNIT-3 (15 Periods)

Incident Response: What is IR, Need for IR, Goals of IR

IR Methodologies: Based on procedure: Phases of IR, Pre-incident Preparation, Detection and Analysis, Containment, Eradication and Recovery, Post Incident Activity. Based on Artifacts: Investigating Unix Systems.

Ram analysis: FTK imager.

UNIT-4 (14 Periods)

Data backup: What is Data Backup, Types of Backup, Types of Storage, Data Backup using rsync, Backup Safety Checks, Features of a Good Backup Strategy.

Log correlation and management: Event Log Concepts, Log Management and its need, Log Management - Using Logwatch, The Windows event logs, Log Analysis and Response.

Text Books :

1. Basic Security Testing with Kali Linux -Daniel W. Dieterle
2. Hacking exposed web applications - JOEL SCAMBRAY MIKE SHEMA

References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS802.1	2	2			3							2	3		
14CS802.2	2	2	3		3							2		2	
14CS802.3	2	2			3							2			3
14CS802.4	2	2			3							2			3

SOFTWARE TESTING METHODOLOGIES

ELECTIVE - IV

IV B.Tech – VIII Semester (Code: 14CS803(A))

Lectures	:	4 Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Software Engineering (14CS501), Software Project Management(14CS705(A))

Course Outcomes: Students will be able to:

14CS803(A).1	Understand SDLC Models ,Testing & Types of Testing in detailed.
14CS803(A).2	Understand the levels of Testing which are integrated to work on Software Assurance.
14CS803(A).3	Understand the concepts of issues related on testing and Organization Structures for Testing Teams.
14CS803(A).4	Understand the concepts of Test Planning, Management, Execution and Reporting & Automation.

UNIT-1 (16 Periods)

Principles of Testing; Software Development Life Cycle Models: Phases of Software Project, Quality, Quality Assurance and Quality Control, Testing, Verification and Validation, Process Model to Represent Different Phases.

White Box Testing: Static Testing, Structural Testing, Challenges. **Black Box Testing:** What, Why, When, How.

UNIT-2 (15 Periods)

Integration Testing: Integration Testing as a Type of Testing, Integration Testing as a Phase of Testing, Scenario Testing, Defect Bash.

System and Acceptance Testing: Overview, Functional Versus Non-Functional, Functional System Testing & Non-Functional, Acceptance Testing.

Performance Testing: Introduction, Factors, Methodology, Tools & Process.

Regression Testing: Introduction, Types, When to do Regression Testing, how to do Regression Testing, Best Practices in Regression Testing.

UNIT-3 (15 Periods)

Ad hoc Testing: Overview, Buddy Testing, Pair Testing, Exploratory Testing, Iterative, Agile and Extreme Testing, Defect Seeding.

Usability and Accessibility Testing: Approach to Usability, When to do Usability, How to achieve Usability, Quality Factors for Usability, Aesthetics Testing, Accessibility Testing, Tools for Usability, Usability Lab Setup, Test Roles for Usability.

Common People Issues: Perceptions and Misconceptions About Testing, Comparison between Testing and Development Functions, Providing Career Paths for Testing Professionals, Role of the Ecosystem and a Call for Action.

Organization Structures for Testing Teams: Dimensions of Organization Structures, Structures in Single-Product Companies, Multi-product Companies, Effects of Globalization and Geographically Distributed Teams on Product Testing, Testing Services Organizations, Success Factors for Testing Organizations.

UNIT-4	(14 Periods)

Test Planning, Management, Execution and Reporting: Introduction, Planning, Management, Process, and Reporting, Best Practices.

Software Test Automation: Terms used in Automation, Skills needed for Automation, What to Automate, Scope of Automation, Design and Architecture for Automation, Generic Requirements for Test Tools, Process Model for Automation, Selecting a Test Tool, Automation for Extreme Programming Model, Challenges.

Test Metrics and Measurements: Metrics & Measurements, Types, Project, Progress, Productivity, Release

Text Books :	1. Srinivasa Desikan & Gopalaswamy Ramesh, "Software Testing – Principles and Practices", Pearson Education, 2007.
References :	1. "Software Testing techniques", BarisBeizer, Dreamtech, second edition. 2. "The craft of software testing", Brian Marick, Pearson Education. 3. "Software Testing Techniques", SPD (Oreille). 4. "Software Testing – Effective Methods, Tools and Techniques", Renu Rajani, Pradeep Oak, TMK. 5. "Effective methods of Software Testing", Perry, John Wiley.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS803(A).1	2				2	2	3	3	3	1		2	3		3
14CS803(A).2	3			2		2	3	2		2	2	3	3		2
14CS803(A).3	3			3	3			3	2	2	2		2		3
14CS803(A).4	3			3	3	3	3		2		2		2		3

WEB MINING

ELECTIVE - IV

IV B.Tech – VIII Semester (Code: 14CS803(B))

Lectures	:	4 Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS803(B).1	Able to understand theoretical models of web mining.
14CS803(B).2	To understand usage of web mining.
14CS803(B).3	Able to crewel the web for data collection.
14CS803(B).4	Able to understand various ways of extracting data from web.

UNIT-1 (16 Periods)

INTRODUCTION: Introduction – Web Mining – Theoretical background –Algorithms and techniques – Association rule mining – Sequential Pattern Mining -Information retrieval and Web search – Information retrieval Models-Relevance Feedback- Text and Web page Pre-processing – Inverted Index – Latent Semantic Indexing – Web Search – Meta-Search – Web Spamming

UNIT-2 (15 Periods)

WEB CONTENT MINING: Web Content Mining – Supervised Learning – Decision tree - Naïve Bayesian Text Classification -Support Vector Machines - Ensemble of Classifiers. Unsupervised Learning - K-means Clustering -Hierarchical Clustering –Partially Supervised Learning – Markov Models - Probability-Based Clustering - Evaluating Classification and Clustering – Vector Space Model – Latent semantic Indexing – Automatic Topic Extraction - Opinion Mining and Sentiment Analysis – Document Sentiment Classification

UNIT-3 (15 Periods)

WEB LINK MINING: Web Link Mining – Hyperlink based Ranking – Introduction -Social Networks Analysis- Co-Citation and Bibliographic Coupling - Page Rank -Authorities and Hubs -Link-Based Similarity Search -Enhanced Techniques for Page Ranking - Community Discovery – Web Crawling -A Basic Crawler Algorithm- Implementation Issues- Universal Crawlers- Focused Crawlers- Topical Crawlers-Evaluation - Crawler Ethics and Conflicts - New Developments

UNIT-4 (14 Periods)

STRUCTURED DATA EXTRACTION: Structured Data Extraction: Wrapper Generation – Preliminaries- Wrapper Induction- Instance-Based Wrapper Learning ·- Automatic Wrapper Generation: Problems - String Matching and Tree Matching -.Multiple Alignment - Building DOM Trees - Extraction Based on a Single List Page and Multiple pages- Introduction to Schema Matching - Schema-Level Match -Domain and Instance-Level Matching – Extracting and Analyzing Web Social Networks.

Text Books :

1. Bing Liu, “Web Data Mining: Exploring Hyperlinks, Contents, and Usage

	Data (Data-Centric Systems and Applications)", Springer; 2nd Edition 2009
References :	1. GuandongXu, Yanchun Zhang, Lin Li, "Web Mining and Social Networking: Techniques and Applications", Springer; 1st Edition.2010 2. Zdravko Markov, Daniel T. Larose, "Data Mining the Web: Uncovering Patterns in Web Content, Structure, and Usage", John Wiley & Sons, Inc., 2007 3. Soumen Chakrabarti, "Mining the Web: Discovering Knowledge from Hypertext Data", Morgan Kaufmann; edition 2002

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS803(B).1	3	3	3		3				3			3		3	
14CS803(B).2		2	2									2			2
14CS803(B).3	2		2			2						2		2	
14CS803(B).4	3	3	3			3				3				3	

ADVANCED DATABASES MANAGEMENT SYSTEMS

ELECTIVE - IV

IV B.Tech – VIII Semester (Code: 14CS803(C))

Lectures	:	4 Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS803(C).1	Understanding issues related to the relational model in the Data Designing
14CS803(C).2	Understand concepts of Distributed Databases
14CS803(C).3	Understand concepts of Object Oriented Databases
14CS803(C).4	Understand the concepts of Emerging Systems & Current issues.

UNIT-1 (16 Periods)

RELATIONAL MODEL ISSUES: ER Model - Normalization – Query Processing – Query Optimization - Transaction Processing - Concurrency Control – Recovery - Database Tuning.

UNIT-2 (15 Periods)

DISTRIBUTED DATABASES: Parallel Databases – Inter and Intra Query Parallelism – Distributed Database Features – Distributed Database Architecture – Fragmentation – Distributed Query Processing – Distributed Transactions Processing – Concurrency Control – Recovery – Commit Protocols.

UNIT-3 (15 Periods)

OBJECT ORIENTED DATABASES: Introduction to Object Oriented Data Bases - Approaches - Modeling and Design Persistence – Query Languages - Transaction - Concurrency – Multi Version Locks – Recovery – POSTGRES – JASMINE –GEMSTONE - ODMG Model.

UNIT-4 (14 Periods)

EMERGING SYSTEMS: Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases- XML and Web Databases.
CURRENTISSUES: Rules - Knowledge Bases - Active and Deductive Databases – Multimedia Databases– Multimedia Data Structures – Multimedia Query languages - Spatial Databases.

Text Books :

1. Thomas Connolly and Carlolyn Begg, “Database Systems, A Practical Approach to Design, Implementation and Management”, Third Edition, Pearson Education

References :

1. R. Elmasri, S.B. Navathe, “Fundamentals of Database Systems”, Fifth Edition, PearsonEducation,2006.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Fifth Edition, Tata McGrawHill,2006.
3. C.J.Date, A.Kannan, S.Swamynathan, “An Introduction to Database Systems”, Eighth Edition, Pearson Education, 2006.

Course Outcome, Program Objectives & Program Specific Objectives Mapping															
	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS803(C).1	3	3	3	3						3		3			
14CS803(C).2															
14CS803(C).3	3		2							3					
14CS803(C).4		3		3								3			

BIO INFORMATICS

ELECTIVE - IV

IV B.Tech – VIII Semester (Code: 14CS803(D))

Lectures	:	4 Periods/Week, SelfStudy:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS803(D).1	Understand the basics of Molecular Biology, Bioinformatics, DNA Sequence, structure, Bioinformatics applications, central dogma, DNA databases,
14CS803(D).2	Understand DNA sequence analysis, ESTs, pairwise alignment techniques, local & global similarity, pairwise database searching.
14CS803(D).3	Understand multiple sequence alignment, phylogenetic analysis, tools for phylogenetic analysis, secondary database searching.
14CS803(D).4	Understand Gene Expression, micro arrays, data sources, tools, applications, analysis packages, intranet and internet packages

UNIT-1 (16 Periods)

Introduction: Definitions, Sequencing, Molecular Biology and Bioinformatics, Biological Sequence/structure, Genomoe Projects, Pattern Recognition and prediction, Folding problem, Sequence Analysis, Homology and Analogy, Bioinformatics Applications, Central Dogma of Molecular Biology

Information Resources: Biological databases, Primary Sequence databases, Protein sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases DNA sequence databases, specialized genomic resources

UNIT-2 (15 Periods)

DNA Sequence Analysis: Importance of DNA analysis, Gene Structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene Hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases, The Human Genome Project

Pair Wise Alignment Techniques: Database Searching, Alphabets and complexity, algorithm and programs, comparing two sequences, sub-sequences, Identity and similarity, The Dot plot, Local and Global similarity, Different alignment techniques, Scoring Matrices, Dynamic Programming, Pair wise database searching

UNIT-3 (15 Periods)

Multiple sequence alignment & Phylogenetic Analysis: Definition and goal, the consensus, Computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments, and searching, Applications of Multiple Sequence alignment, Phylogenetic Analysis, Methods of Phylogenetic Analysis, Tree Evaluation, Problems in Phylogenetic analysis, Tools for Phylogenetic Analysis

Secondary database Searching: Importance and need of secondary database searches, secondary database structure and building a sequence search protocol.

UNIT-4 (14 Periods)

Gene Expression and Microarrays: Introduction, DNA Microarrays, Clustering Gene, Expression Profiles, Data Sources and tools, Applications.
Analysis Packages: Analysis Package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages, Internet Packages.

Text Books :	1. "Introduction to Bioinformatics", T K Attwood and D.J. Parry-Smith, Pearson. 2. "Bioinformatics methods and applications", S.C. Rastogi, N. Mendiratta and P. Rastogi., PHI.
References :	1. "Introduction to Bioinformatics", Arthur M. Lesk, OXFORD Publishers (Indian Edition). 2. "Elementary Bioinformatics", ImtiyazAlam Khan, Pharma Book Syndicate

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS803(D).1	3	3	2	3	2							2	1	2	2
14CS803(D).2	3				2										2
14CS803(D).3			3									2		2	
14CS803(D).4	3			3									1		

APPLICATION PROGRAMMING USING PYTHON

ELECTIVE - V

IV B.Tech – VIII Semester (Code: 14CS804(A))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CS804(A).1	Understanding of scripting and the contributions of python language.
14CS804(A).2	Understanding of Python especially the object-oriented concepts, using databases.
14CS804(A).3	Able to design and implement machine learning solutions to classification, regression.
14CS804(A).4	Able to design and implement machine learning solutions to clustering problems and features of various data.

UNIT-1 (13 Periods)

Introduction: Overview, History of Python, Python Features, Environment Setup.

Variables, expressions, and statements: values and types, variables, names and keywords, statements, operators and operands, expressions, order of operations, modulus operator, string operations, asking the user for input, comments, choosing mnemonic variable names.

Conditional execution: Boolean expressions, logical operators, conditional execution, alternative execution, chained conditionals, nested conditionals, catching exceptions using try and except, short-circuit evaluation of logical expressions.

Functions: function calls, built-in functions, type conversion functions, random numbers, math functions, adding new functions, definitions and uses, flow of execution, parameters and arguments, fruitful functions and void functions.

Iteration: updating variables, the while statement, infinite loops and break, finishing iterations with continue, definite loops using for, loop patterns.

Strings: a string is a sequence, getting the length of a string using len, traversal through a string with a loop, string slices, strings are immutable, looping and counting, the in operator, string comparison, string methods, parsing strings, format operator.

Files I/O: persistence, opening files, text files and lines, reading files, searching through a file, letting the user choose the file name, using try except and open, writing files.

UNIT-2 (13 Periods)

Lists: a list is a sequence, lists are mutable, traversing, operations, slices, methods, deleting elements, functions, strings, parsing lines, objects and values, aliasing, arguments.

Dictionaries: dictionary as a set of counters, dictionaries and files, looping and dictionaries, advanced text parsing.

Tuples: tuples are immutable, comparing tuples, tuple assignment, dictionaries and tuples, multiple assignment with dictionaries, the most common words, using tuples as keys in dictionaries, sequences.

Object-Oriented Programming: Managing Larger Programs, Using Objects, starting with Programs, Subdividing a Problem – Encapsulation, First Python Object, Classes as Types,

Object Lifecycle, Many Instances, Inheritance.

Using Databases and SQL: Database concepts, Database Browser for SQLite, creating a database table, Structured Query Language summary, Basic data modeling, Programming with multiple tables, three kinds of keys, Using JOIN to retrieve data.

UNIT-3 (12 Periods)

Machine learning: Introduction to machine learning, Scikit-learn. Features of Scikit-learn.

Supervised Learning: Classification and Regression, Generalization, Overfitting and Underfitting, Supervised Machine Learning Algorithms, k-Nearest Neighbor, Linear models, Naive Bayes Classifiers, Decision trees, Ensembles of Decision Trees, Kernelized Support Vector Machines, Neural Networks, Uncertainty estimates from classifiers.

UNIT-4 (12 Periods)

Unsupervised Learning and Preprocessing: Types of unsupervised learning, Preprocessing and Scaling, Dimensionality Reduction, Feature Extraction and Manifold Learning, Clustering.

Representing Data and Engineering Features: Categorical Variables, Binning, Discretization, Linear Models and Trees, Binning, Discretization, Linear Models and Trees, Interactions and Polynomials, Univariate Non-linear transformations, Automatic Feature Selection, Utilizing Expert Knowledge

Text Books :

1. Python for Everybody, 2016 Edition by Charles R. Severance.
2. Introduction to Machine Learning with Python by Andreas C. Mueller and Sarah Guido, O'Reilly Media, Inc.

References :

1. Core Python Programming Paperback – 2016 by R. Nageswara Rao, Dreamtech Press.
2. Python Programming: A Modern Approach by Vamsi Kurama, Pearson.
3. Machine Learning in Python by Michael Bowles, Wiley.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS804(A).1				3	2					3			3	3	3
14CS804(A).2				**2**						**3**				**3**	
14CS804(A).3					**2**										3
14CS804(A).4				**3**						**2**			**3**		

NETWORK MANAGEMENT SYSTEMS

ELECTIVE - V

IV B.Tech – VIII Semester (Code: 14CS804(B))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Computer Network(14CS403)

Course Outcomes: Students will be able to:

14CS804(B).1	Understand the how to maintain and manage Local Area Networks and internetworks.
14CS804(B).2	Understand the SNMPV1 network management.
14CS804(B).3	Understand the remote monitoring and tele communication management network.
14CS804(B).4	Understand the network management tools and system

UNIT-1 (13 Periods)

Data communications and Network Management Overview: Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

SNMPV1 Network Management: Organization and Information and Information Models.

Managed network: Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

UNIT-2 (13 Periods)

SNMPv1 Network Management: Communication and Functional Models. The SNMP Communication Model, Functional model.

SNMP ManagementSNMPv2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base,SNMPv2 Protocol, Compatibility With SNMPv1.

UNIT-3 (12 Periods)

SNMP Management RMON: What is Remote Monitoring? RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON.

Telecommunications Management Network: Why TMN? Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, implementation Issues.

UNIT-4 (12 Periods)

Network Management Tools and Systems: Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network Management Systems, System Management, and Enterprise Management Solutions.

Web-Based Management: NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network: Future Directions.	
Text Books :	1. "Network Management - Principles and Practice", Mani Subrahmanian, Pearson Education.
References :	1. "Network management", Morris, Pearson Education. 2. "Principles of Network System Administration", Mark Burges, Wiley Dreamtech. 3. "Distributed Network Management", Paul, John Wiley.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS804(B).1	2	3	3	3	3	3	3	1	3	3	3	2	3		2
14CS804(B).2															
14CS804(B).3	2		3		3		3		3		3	2	3		
14CS804(B).4	1			2		3		1		3	2				2

HIGH SPEED NETWORKS

ELECTIVE - V

IV B.Tech – VIII Semester (Code: 14CS804(C))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Computer Networks (14CS603)

Course Outcomes: Students will be able to:

14CS804(C).1	Understand What are the types of High Speed Networks and concepts of ATM and High Speed LAN's .
14CS804(C).2	Understand the concepts of Queuing and Congestion & Traffic Management.
14CS804(C).3	Understand the concepts of TCP control and Congestion & Traffic Management of ATM.
14CS804(C).4	Understand the concepts of Integrated & Differentiated Services and different types of PROTOCOLS which supports QoS.

UNIT-1 (13 Periods)

HIGH SPEED NETWORKS: Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, TM logical Connection, ATM Cell – ATM Service Categories – AAL. High **SpeedLAN's**: Fast Ethernet, Gigabit Ethernet, Fibre Channel – Wireless LAN's.

UNIT-2 (13 Periods)

CONGESTION AND TRAFFIC MANAGEMENT: Queuing Analysis- Queuing Models – Single Server Queues – Effects of Congestion –Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT-3 (12 Periods)

TCP AND ATM CONGESTION CONTROL: TCP Flow control – TCP Congestion Control – Retransmission – Timer Management –Exponential RTO back off – KARN's Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes –Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats, ABR Capacity allocations – GFR traffic management.

UNIT-4 (12 Periods)

INTEGRATED AND DIFFERENTIATED SERVICES: Integrated Services Architecture – Approach, Components, Services- Queuing Discipline, FQ, PS, BRFQ, GPS, WFQ – Random Early Detection, Differentiated Services.

PROTOCOLS FOR QoS SUPPORT: RSVP – Goals & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms –Multiprotocol Label Switching – Operations, Label Stacking, Protocol details – RTP –Protocol Architecture, Data Transfer Protocol, RTCP.

Text Books :

1. William Stallings, "HIGH SPEED NETWORKS AND INTERNET", Pearson Education, Second Edition, 2002

References :	1. Warland & PravinVaraiya, “HIGH PERFORMANCE COMMUNICATION NETWORKS”, Jean Harcourt Asia Pvt. Ltd., II Edition, 2001. 2. IrvanPepelnjk, Jim Guichard and Jeff Apcar, “MPLS and VPN architecture”, Cisco Press, Volume 1 and 2, 2003.

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS804(C).1	1	1	-	1	-	-	-	-	-	1	-	3	1	-	-
14CS804(C).2	1	1	-	1	-	-	-	-	-	1	-	3	1	2	-
14CS804(C).3	1	1	-	1	-	-	-	-	-	1	-	3	1	1	-
14CS804(C).4	1	1	-	1	-	-	-	-	-	1	-	3	1	1	-

REAL TIME SYSTEMS

ELECTIVE - V

IV B.Tech – VIII Semester (Code: 14CS804(D))

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite: Operating Systems (14CS304)

Course Outcomes: Students will be able to:

14CS804(D).1	Understand what are real-time systems, applications and types of real-time systems, and a reference model for real-time systems.
14CS804(D).2	Understand commonly used approaches for real time systems.
14CS804(D).3	Understand fixed and dynamic priority algorithms (Rate Monotonic, and deadline monotonic algorithms), schedulability test for fixed priority tasks, sufficient, schedulability conditions for RM and DM algorithms.
14CS804(D).4	Students are able to understand other types of jobs Aperiodic and sporadic, and study different types of servers, deferrable, sporadic constant utilization total bandwidth and weighted fair-queuing server. Scheduling of sporadic jobs.

UNIT-1 (13 Periods)

Introduction: Typical Real-Time applications, Hard versus Soft Real-Time systems, A reference model of Real-Time Systems.

UNIT-2 (13 Periods)

Commonly used approaches to Real-Time scheduling: Clock-Driven scheduling, Pros and Cons of Clock-driven scheduling.

UNIT-3 (12 Periods)

Priority-Driven scheduling of Periodic tasks: static assumption, Fixed-Priority versus Dynamic-Priority algorithms, Optimality of the RM and DM algorithms, A schedulability test for Fixed-Priority tasks with short response times and arbitrary response times, sufficient schedulability conditions for the RM and DM algorithms;

Scheduling Aperiodic and Sporadic jobs in Priority-Driven systems: Deferrable Servers, Sporadic Servers, Constant Utilization, Total Bandwidth and weighted Fair-Queuing Servers, Scheduling of sporadic Jobs.

UNIT-4 (12 Periods)

Resources and Resources Access Control: Scheduling Flexible computations and tasks with temporal distance constraints.

Text Books :	1. Jane W.S.Liu, “Real-Time Systems”, Pearson Education Asia
References :	1. C.M.Krishna and G.Shin, “Real-Time Systems”, Tata McGraw Hill Co. Inc., 1997.

Course Outcome, Program Objectives & Program Specific Objectives Mapping															
	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CS804(D).1	2	2											2		
14CS804(D).2			3	3	3	3								3	3
14CS804(D).3			2	2	2	2								2	2
14CS804(D).4			3	3	3	3								3	3

PROJECT WORK IV B.Tech – VIII Semester (Code: 14CSPR801)					
Lectures	:	12 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CSPR801.1	To design and develop solution to the problem studied during term paper
14CSPR801.2	To apply the knowledge of domain, basic and engineering sciences to solve the problem.
14CSPR801.3	To interpret and analyze the results for providing valid conclusions
14CSPR801.4	To Develop lifelong learning ability through in depth study of selected area

The Project work shall be carried out by a batch consisting not more than four students for one semester. It should help the students to comprehend and apply different theories and technologies that they have learnt through and are learning. It should lead to a substantial result as a comparative study, a new application of the technologies available or some extension to the works carried out by some researcher and published in referred journals. Each batch must carry out the analysis, design, implementation and testing of the entire project basing on the Software Engineering principles. There shall be a total of four reviews made by the batch regarding:

1. 0^{th} Review : The idea/concept which forms the basis for their project shall be presented to the guide, concerned in charge and classmates and shall get the approval for Continuation.
2. 1^{st} Review : The analysis and design carried out.
3. 2^{na} Review : The implementation and the testing done.
4. 3^{rd} Review : Over all Presentation of the work carried out and the results found out for the valuation under the internal Assessment.

A comprehensive report on the lines of IEEE Format is to be submitted at the end of the semester, which is certified by the concerned guide and the HOD.
There shall be an external guide appointed by the University to make an assessment and to carry out the Viva-Voce examination.

Text Books :

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSPR801.1	3	3	3	3	3	2	2	2	3	3	2	3	3	3	3
14CSPR801.2	3		2				2					3		3	3
14CSPR801.3		3			2			2	3	2	2		3		2
14CSPR801.4			3	1	3	1						2		2	

ADVANCED CYBER SECURITY LAB

IV B.Tech – VIII Semester (Code: 14CSL802)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Pre-Requisite:

Course Outcomes: Students will be able to:

14CSL802.1	Understand the concepts of reconnaissance and wireless networks attacks, security tools.
14CSL802.2	Understanding the usage of security tools for protecting system resources.
14CSL802.3	Understand the concepts of incident response and disk analysis.
14CSL802.4	Understand the concepts of data backup and log correlation management.

LIST OF EXPERIMENTS

1. Foot printing and Reconnaissance.
2. Wireless Network attacks:
   a) Viewing Wireless networks with Airmon-NG.
   b) Viewing Wi-Fi packets and hidden APs in Wireshark.
   c) Change MAC address of your Wi-Fi card.
3. Fern Wi-Fi Testing with WiFite.
4. WiFiteKismet.
5. Analysing the Data Easy Creds.
6. Web application security tools:
   a) Burpsuit
   b) Netsparker
   c) Arachni
   d) W3af
7. Antivirus: ClamAV
8. Patch management: MBSA
9. Incident Response: Investigating UNIX System
10. Ram Analyzer: FTK Imager.
11. Data Backup: rsync
12. Log correlation & Management: Logwatch.

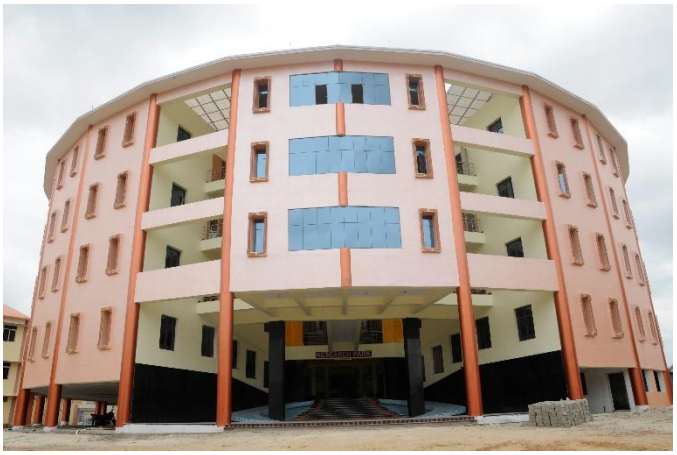
Text Books :	
References :	

Course Outcome, Program Objectives & Program Specific Objectives Mapping

	POs												PSOs		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
14CSL802.1	3	3	2	3	3	3	3					3	2	3	3
14CSL802.2			2		3		3					3	2		2
14CSL802.3	2	3			2	2								3	
14CSL802.4	3		1			1						1			1

ADMINISTRATIVE & LIBRARY BLOCK

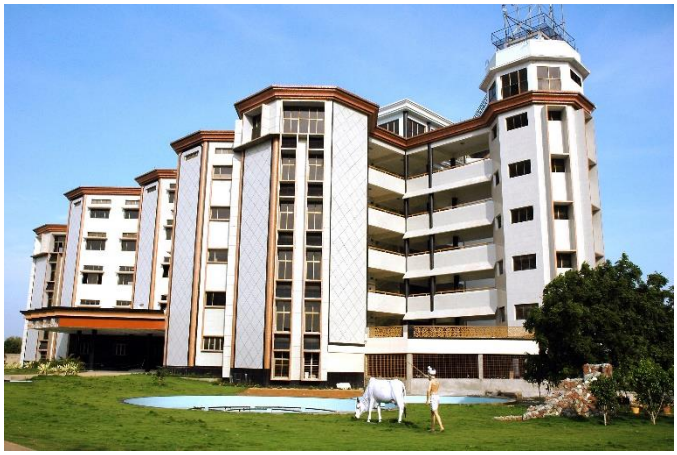
RESEARCH PARK



CIVIL & MECHANICAL BLOCK

LADIES HOSTEL

GENERAL ENGINEERING BLOCK



GUEST HOUSE

Bapatla Engineering College (Autonomous)

(Approved by AICTE, under the jurisdiction of Acharya Nagarjuna University, Guntur)
Thrice Accredited by NBA
Mahatmajipuram, GBC Road,
Bapatla-522102, Guntur District, Andhra Pradesh