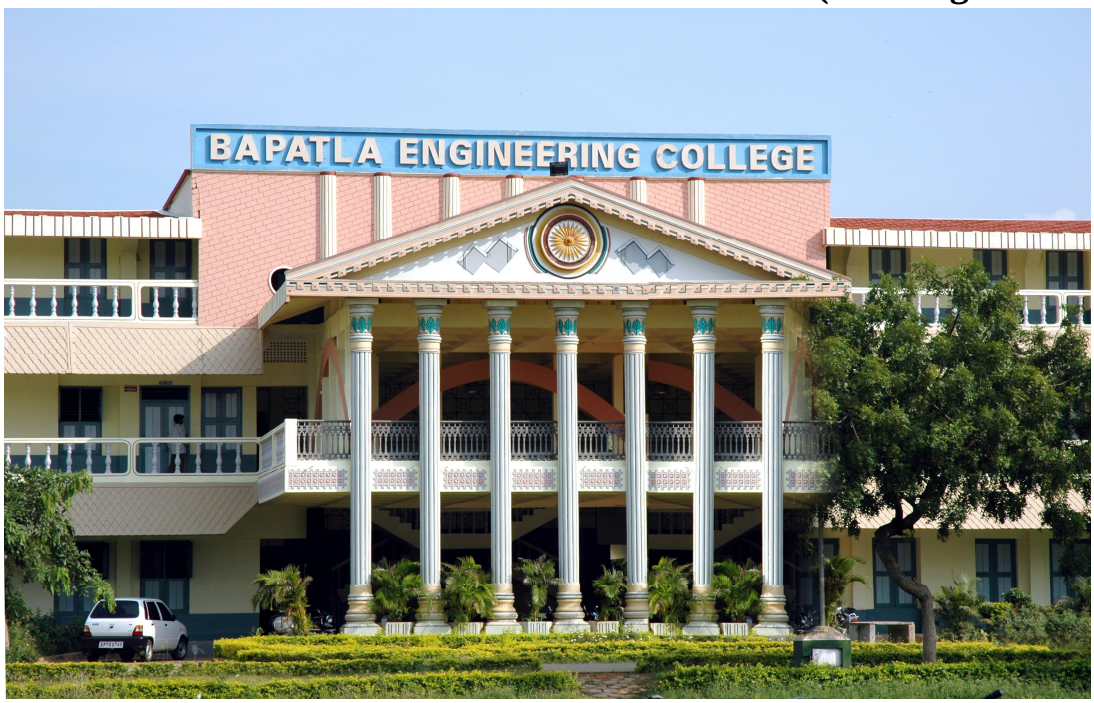
Bapatla Engineering College

(Autonomous)

B.Tech

Information Technology

Curriculum Effective from A.Y. 2018-19 (R18 Regulations)



Bapatla Engineering College :: Bapatla

(Autonomous under Acharya Nagarjuna University)

(Sponsored by Bapatla Education Society)

BAPATLA - 522102 Guntur District, A.P., INDIA www.becbapatla.ac.in

Course Structure Summary

S.No.	Category	No. of Credits	% of Credits
1	Humanities & Social Science including Management Courses	12	7.3
2	Basic Science Courses	20	12.2
3	Engineering Science courses	15	9.2
4	Professional Core Courses	75	46.01
5	Professional Elective Courses	19	11.65
6	Open Elective Courses	6	3.7
7	Project work, seminar and internship in industry or elsewhere	12	7.3
8	Industry Internship	2	1.2
9	MOOCs	2	1.2
8	Mandatory Courses	(non-credit courses)	–
	Total:-	163	100

Course Structure Summary

Semester	Credits
Semester – I	17
Semester – II	21
Semester – III	20
Semester – IV	21
Semester – V	23
Semester – VI	21
Semester – VII	21
Semester – VIII	19
Total	163

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

First Year B.Tech., (SEMESTER – I)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18MA001	Linear Algebra and Ordinary Differential Equations	4	0	0	4	50	50	100	3
18CY001	Engineering Chemistry	4	0	0	4	50	50	100	3
18CE001	Environmental Studies	3	0	0	3	50	50	100	2
18EE001	Basic Electrical & Electronics Engineering	4	0	0	4	50	50	100	3
18MEL01	Engineering Graphics	1	0	4	5	50	50	100	3
18CYL01	Chemistry Lab	0	0	3	3	50	50	100	1
18MEL02	Workshop	0	0	3	3	50	50	100	1
18EEL01	Basic Electrical & Electronics Engineering Lab	0	0	3	3	50	50	100	1
	TOTAL	**16**	**0**	**13**	**29**	**400**	**400**	**800**	**17**

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

First Year B.Tech., (SEMESTER – II)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18MA002	Numerical Methods And Advanced Calculus	4	0	0	4	50	50	100	3
18PH001	Semiconductor Physics	4	1	0	5	50	50	100	4
18IT203	Professional Ethics & Human Values	3	0	0	3	50	50	100	3
18IT204	Digital Logic Design	3	1	0	4	50	50	100	3
18EL001	Communicative English	3	0	0	3	50	50	100	2
18CS001	Problem Solving with Programming	4	0	0	4	50	50	100	3
18PHL01	Semiconducter Physics Lab	0	0	3	3	50	50	100	1
18ELL01	Communicative English Lab	0	0	3	3	50	50	100	1
18CSL01	Problem Solving with Programming Lab	0	0	3	3	50	50	100	1
	TOTAL	**21**	**2**	**9**	**32**	**450**	**450**	**900**	**21**

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Second Year B.Tech., (SEMESTER – III)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18IT301	Computer Organization & Architecture	3	1	0	4	50	50	100	3
18IT302	Data Structures	3	1	0	4	50	50	100	3
18IT303	Discrete Mathematics	3	1	0	4	50	50	100	3
18IT304	Object Oriented Programming	3	1	0	4	50	50	100	3
18IT305	Operating System	4	0	0	4	50	50	100	3
18EL002	Technical English	3	0	0	3	50	50	100	2
18ITL31	Data Structures Lab	0	0	3	3	50	50	100	1
18ITL32	Object Oriented Programming Lab	0	0	3	3	50	50	100	1
18ITL33	Operating Systems Lab	0	0	3	3	50	50	100	1
	TOTAL	**19**	**4**	**9**	**32**	**450**	**450**	**900**	**20**

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Second Year B.Tech., (SEMESTER – IV)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18MA003	Probability & Statistics	3	0	2	5	50	50	100	3
18IT402	Web Technologies	3	1	0	4	50	50	100	3
18IT403	Database Management Systems	3	1	0	4	50	50	100	3
18IT404	Script Programming	3	1	0	4	50	50	100	3
18IT405	Computer Networks	3	0	2	5	50	50	100	3
18IT406	Design & Analysis of Algorithms	3	0	2	5	50	50	100	3
18ITL41	Web Technologies Lab	0	0	3	3	50	50	100	1
18ITL42	RDBMS Lab	0	0	3	3	50	50	100	1
18ITL43	Script Programming Lab	0	0	3	3	50	50	100	1
	TOTAL	**18**	**3**	**15**	**36**	**450**	**450**	**900**	**21**

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Third Year B.Tech., (SEMESTER – V)

For

Information Technology

*With Effective From **2018-2019** Academic Year*

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18IT501	Software Engineering	4	0	0	4	50	50	100	3
18IT502	Automata & Compiler Design	3	1	0	4	50	50	100	3
18IT503	Enterprise Programming	4	0	0	4	50	50	100	3
18IT504	Wireless Networks	4	0	0	4	50	50	100	3
18IT505	Machine Learning	4	0	0	4	50	50	100	3
18ITD1	Elective -I	4	0	0	4	50	50	100	3
18ITL51	Enterprise Programming Lab	0	0	3	3	50	50	100	1
18ITL52	Machine Learning Lab	0	0	3	3	50	50	100	1
18ITDL53	Elective -I Lab	0	0	3	3	50	50	100	1
18ITMO1	MOOC								2
	TOTAL	**23**	**1**	**9**	**33**	**450**	**450**	**900**	**23**

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination **Lec :** Lecture

Tut : Tutorial **Pra :** Practical

Elective-I

18ITD11 Algorithmic Graph Theory
18ITD12 No SQL Databases
18ITD13 Advanced Web Technologies
18ITD14 Introduction to Computer Animation

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Third Year B.Tech., (SEMESTER – VI)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18IT601	Human Computer Interaction	4	0	0	4	50	50	100	3
18IT602	Artificial Intelligence	4	0	0	4	50	50	100	3
18IT603	Introduction to Cyber Security	4	0	0	4	50	50	100	3
18IT604	Cloud Computing	4	0	0	4	50	50	100	3
18ITD2	Elective -II	3	0	2	5	50	50	100	3
18ITD3	Elective -III	4	0	0	4	50	50	100	3
18ELL02	Soft Skills Lab	0	0	3	3	50	50	100	1
18ITL62	Artificial Intelligence Lab	0	0	3	3	50	50	100	1
18ITL63	Cloud Computing lab	0	0	3	3	50	50	100	1
	TOTAL	**23**	**0**	**11**	**34**	**450**	**450**	**900**	**21**

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination **Lec :** Lecture

Tut : Tutorial **Pra :** Practical

Elective-II

18ITD21 Software Testing Methodologies
18ITD22 Natural Language Processing
18ITD23 Big Data Analytics
18ITD24 Advanced Computer Animation

Elective-III

18ITD31 Software Design Patterns
18ITD32 Deep Learning
18ITD33 Distributed Systems
18ITD34 Adhoc & Sensor Networks

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER – VII)
For
Information Technology
With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18IT701	Internet of Things	4	0	0	4	50	50	100	3
18IT702	Advanced Cyber Security	4	0	0	4	50	50	100	3
18ITD4	Elective -IV	3	0	2	5	50	50	100	3
18ITI01	Institutional Elective -I	4	0	0	4	50	50	100	3
18ITD5	Elective -V	4	0	0	4	50	50	100	3
18HU001	Constitution of India	3	0	0	3	50	50	100	0
18ITL71	Internet of Things Lab	0	0	3	3	50	50	100	1
18ITL72	Advanced Cyber Security Lab	0	0	3	3	50	50	100	1
18ITP01	Project-I	0	0	6	6	50	50	100	2
18ITIT1	Internship					100		100	2
	TOTAL	**22**	**0**	**14**	**36**	**550**	**450**	**1000**	**21**

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination **Lec :** Lecture

Tut : Tutorial **Pra :** Practical

Elective -IV:

18ITD41 Object Oriented Analysis & Design
18ITD42 .Net Technologies
18ITD43 Mobile App Development **18ITD44** DevOps

Elective -V:
18ITD51 Parallel Computing
18ITD52 Block Chain Technology
18ITD53 Bio-Informatics
18ITD54 Introduction to Game Development

*** Refer Page xxx for list of Institutional Elective -I courses**

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER – VIII)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18ME002	Industrial Management & Entrepreneurship Development	4	0	0	4	50	50	100	3
18ITI02	Institutional Elective -II	4	0	0	4	50	50	100	3
18ITD6	Elective -VI	4	0	0	4	50	50	100	3
18ITP02	Project-II	0	0	16	16	50	50	100	10
	TOTAL	**12**	**0**	**16**	**28**	**200**	**200**	**400**	**19**

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination **Lec :** Lecture

Tut : Tutorial **Pra :** Practical

Elective- VI

18ITD61 Security in IOT
18ITD62 Pattern Recognition
18ITD63 Software Project Management
18ITD64 Advanced Game Development

*** Refer Page xxxi for list of Institutional Elective -II courses**

List of Institutional Electives offered by IT Department

Code No	Title	Offered In
18ITI01	Data Analytics	VII Sem.
18ITI02	Cyber Security	VII Sem.
18ITI03	Mobile Application Development	VIII Sem.
18ITI04	Web Technologies	VIII Sem.

Institutional Electives offered to IT students by other departments

Code No	Title	Offered In
18CEI01	Air Pollution & Control	VII Sem
18CEI02	Sustainable Water and Sanitation	VII Sem
18CSI01	Java Programming	VII Sem
18CSI02	Database Management Systems	VII Sem
18ECI01	Consumer Electronics	VII Sem
18ECI02	Embedded Systems	VII Sem
18EEI01	Application of Wavelets to Engineering Problems	VII Sem
18EEI02	Industrial Electrical Systems	VII Sem
18EII01	Principles & Applications of MEMS	VII Sem
18EII02	Power System Instrumentation	VII Sem
18MEI01	Fluid Power and Control Systems	VII Sem
18MEI02	Project Management	VII Sem
18MAI01	Linear Algebra	VII Sem
18PHI01	Nano-Materials and Technology	VII Sem
18PHI02	Fiber Optic Communication	VII Sem
18HUI01	System Thinking	VII Sem

Institutional Electives offered to IT students by other departments

Code No	Title	Offered In
18CEI03	Disaster Management	VIII Sem
18CEI04	Remote sensing & GIS	VIII Sem
18CSI03	Python Programming	VIII Sem
18CSI04	Computer Networks	VIII Sem
18ECI03	Artificial Neural Network	VIII Sem
18ECI04	Internet of Things (IoT)	VIII Sem
18EEI03	High Voltage Engineering	VIII Sem
18EEI04	Energy Auditing and Conservation	VIII Sem
18EII03	Robotics and Automation	VIII Sem
18EII04	Advanced Computer Control Systems	VIII Sem
18MEI03	Non-Conventional Energy Sources	VIII Sem
18MEI04	Automobile Engineering	VIII Sem
18MAI02	Graph Theory	VIII Sem
18PHI03	Advanced Materials	VIII Sem
18PHI04	Optical Electronics	VIII Sem
18HUI02	Organizational Psychology	VIII Sem
18HUI03	Telugu Modern Literature	VIII Sem
18ELI03	English Through Media	VIII Sem

LINEAR ALGEBRA & ODE

I B.Tech – I Semester (18MA001)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: To learn about solving a system of linear homogeneous and non-homogeneous equations, finding the inverse of a given square matrix and also its Eigen values and Eigen vectors.

COB 2: Identify the type of a given differential equation and select and apply the appropriate analytical technique for finding the solution of first order and higher order ordinary Differential equations.

COB 3: Create and analyze mathematical models using first and second order differential equations to solve application problems that arises in engineering.

COB 4: To learn about solving linear Differential equations with constant coefficients with the given initial conditions using Laplace transform technique.

Course Outcomes:

After the course the students are expected to be able to

CO 1: To learn about solving a system of linear homogeneous and non-homogeneous equations, finding the inverse of a given square matrix and also its Eigen values and Eigen vectors.

CO 2: Identify the type of a given differential equation and select and apply the appropriate analytical technique for finding the solution of first order and higher order ordinary Differential equations.

CO 3: Create and analyze mathematical models using first and second order differential equations to solve application problems that arises in engineering.

CO 4: To learn about solving linear Differential equations with constant coefficients with the given initial conditions using Laplace transform technique.

UNIT - I (12 Periods)

Linear Algebra: Rank of a Matrix; Elementary transformations of a matrix; Gauss-Jordan method of finding the inverse; Consistency of linear System of equations: Rouches theorem, System of linear Non-homogeneous equations, System of linear homogeneous equations; vectors; Eigen values; properties of Eigen values(without proofs); Cayley-Hamilton theorem (without proof).
(Sections: 2.7.1; 2.7.2; 2.7.6; 2.10.1; 2.10.2; 2.10.3; 2.12.1; 2.13.1; 2.14; 2.15.)

UNIT - II (12 Periods)

Differential Equations of first order: Definitions; Formation of a Differential equation; Solution of a Differential equation; Equations of the first order and first degree; variables separable; Linear Equations; Bernoulli's equation; Exact Differential equations; Equations reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation, In the equation M dx+ N dy=0.

Applications of a first order Differential equations: Newton's law of cooling; Rate of decay of Radio-active materials.
(Sections: 11.1; 11.3; 11.4; 11.5; 11.6; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4; 12.6; 12.8)

UNIT - III **(12 Periods)**

Linear Differential Equations: Definitions; Theorem; Operator D; Rules for finding the complementary function; Inverse operator; Rules for finding the Particular Integral; Working procedure to solve the equation; Method of Variation of Parameters; Applications of Linear Differential Equations:
Oscillatory Electrical Circuits.
(Sections: 13.1; 13.2.1; 13.3; 13.4; 13.5; 13.6; 13.7;13.8.1;14.1;14.5)

UNIT - IV **(14 Periods)**

Laplace Transforms: Definition; conditions for the existence; Transforms of elementary functions; properties of Laplace Transforms; Transforms of derivatives; Transforms of integrals; Multiplication by tn; Division by t; Inverse transforms- Method of partial fractions; Other methods of finding inverse transforms; Convolution theorem(without proof); Application to differential equations: Solution of ODE with constant coefficients using Laplace transforms.
(Sections:21.2.1; 21.2.2; 21.3; 21.4; 21.7; 21.8; 21.9; 21.10; 21.12; 21.13; 21.14; 21.15.1)

TEXT BOOKS:

1. B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khanna publishers, 2017.

REFERENCES:

1. ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
2. N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

ENGINEERING CHEMISTRY

I B.Tech – I Semester (18CY001)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: With the principles of water characterization and treatment of water for industrial purposes and methods of producing water for potable purposes.

COB 2: To understand the thermodynamic concepts, energy changes, concept of corrosion & its control.

COB 3: With the conventional energy sources, solid, liquid and gaseous Fuels & knowledge of knocking and anti-knocking characteristics.

COB 4: With aim to gain good knowledge of organic reactions, plastics, conducting polymers & biodegradable polymers.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Develop innovative methods to produce soft water for industrial use and able to solve the industrial problems.

CO 2: The students will be familiar with applications of polymers in domestic and engineering areas & the most recent surface characterization techniques.

CO 3: Have the capacity of classifying fuels, their calorific value determination and applying energy sources efficiently and economically for various needs.

CO 4: Explain features, classification, applications of newer class materials like smart materials, refrocteries, abbrasives, lubriants and composite materials etc.

UNIT - I **(15 Periods)**

Introduction: water quality parameters

Characteristics: Alkalinity, Hardness - Estimation & simple neumerical problems,

Boiler Troubles- Sludges, Scales, Caustic embrittlement, boiler corrosion, Priming and foaming; **Internal conditioning-** phosphate, calgon and carbonate methods.

External conditioning - Ion exchange process & Zeolite proess

WHO Guidelines, Potable water, Sedimentation, Coagulation, Filtration. Disinfection methods: Chlorination, ozonization and UV treatment. Salinity – Treatment of Brackish water by Reverse Osmosis and Electrodialysis.

UNIT - II (15 Periods)

Thermodynamic functions: energy, entropy and free energy. Estimations of entropy and free energies.Free energy and emf.Cell potentials, the Nernst equation and applications.

Corrosion: Types of corrosion - Chemical or dry corrosion, Electrochemical or wet corrosion; Galvanic, stress, pitting and differential aeration corrosion; Factors effecting corrosion,**Corrosion control** – Cathodic protection, and electro plating (Au) & electoless Ni plating.

UNIT - III (15 Periods)

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

Solid fuels: Determination of calorific value (Bomb Calorimeter) & related problems, Coal ranking,

Liquid Fuels: Petroleum refining and fractions, composition and uses. Knocking and anti- knocking Agents, Octane number and Cetane number; Bio fuels- Biodiesel, general methods of preparation and advantages

Gaseous fuels: CNG and LPG, Flue gas analysis – Orsat apparatus.

UNIT - IV (15 Periods)

Organic reactions and synthesis of a drug molecule Introduction to reactions involving substitution (SN1, SN2), addition (Markownikoff's and anti-Markwnikoff's rules) , elimination (E1 & E2), Synthesis of a commonly used drug molecule.(Aspirin and Paracetamol)

Polymers: Conducting polymers: Classification, Intrinsic and Extrinsic conducting polymers and their applications. Plastics: Thermoplasts and thermosetting plastics, Bskelite and PVC. Bio degradable polymers: types, examples- Polyhydroxybuterate (PHB), Polyhydroxybuterate-co-β-hydroxyvalerate (PHBV), applications.

TEXT BOOKS:

1. P.C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 17th edition (2017).
2. SeshiChawla, "Engineering Chemistry"DhanpatRai Pub, Co LTD, New Delhi 13 th edition, 2013.

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, 12th Edition, 2012.
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

ENVIRONMENTAL STUDIES

I B.Tech – I Semester (18CE001)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	2

Prerequisites:

Course Objectives:

COB 1: To develop an awareness,knowledge, and appreciation for the natural environment.

COB 2: To understand different types of ecosystems exist in nature.

COB 3: To know our biodiversity.

COB 4: To understand different types of pollutants present in Environment.

COB 5: To know the global environmental problems.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Develop an appreciation for the local and natural history of the area.

CO 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.

CO 3: Know how to manage the harmful pollutants.

CO 4: Gain the knowledge of Environment.

CO 5: Create awareness among the youth on environmental concerns important in the longterm interest of the society.

UNIT - I (12 Periods)

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). 6 periods

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. Chipko movement case study

UNIT – III (12 Periods)

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, Environmental Impacts of Renewable and Non-renewable energy resources. Silent Valley Project and Narmada BachaoAndolan case studies8 periods

Sustainability: Definition, Concept and Equitable use of resources for sustainable development; Rain water harvesting and Watershed management. Fieldwork on Rain water harvesting and Watershed management. 6 periods + 6 hours field work/Demonstration

UNIT - III (18 Periods)

Pollution: Definition; Causes, effects and control of air, water and nuclear pollution; Chernobyl Nuclear Disaster case study; Solid Waste: urban, Industrial and hazardous wastes; Integrated waste management 3R approach, composting and vermicomposting. 12 periods

Environmental acts: Water and air (Prevention and Control of pollution) acts, Environmental protection act, Forest Conservation act. 6 periods

UNIT - IV (24 Periods)

Environmental issues: Green house effect & Global warming, Ozone layer depletion, Acid rains, Green Revolution, Population Growth and environmental quality, Environmental Impact Assessment.Environmental Standards (ISO 14000, etc.) 12 periods

Case Studies: Bhopal Tragedy, Mathura Refinery and TajMahal, and Ralegan Siddhi (Anna Hazare). 6 periods

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. 6 hrs.

TEXT BOOKS:

1. "Environmental Studies" by Benny Joseph, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. "Comprehensive environmental studies"- JP Sharma, Laxmi Publications.
3. Text Book of environmental Studies – ErachBharucha

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

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I B.Tech – I Semester (18EE001)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: To develop an awareness,knowledge, and appreciation for the natural environment.

COB 2: To understand different types of ecosystems exist in nature.

COB 3: To know our biodiversity.

COB 4: To understand different types of pollutants present in Environment.

COB 5: To know the global environmental problems.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Develop an appreciation for the local and natural history of the area.

CO 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.

CO 3: Know how to manage the harmful pollutants.

CO 4: Gain the knowledge of Environment.

CO 5: Create awareness among the youth on environmental concerns important in the longterm interest of the society.

UNIT - I (16 Periods)

Electrical Circuits

Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation.Superposition, Thevenin and Norton Theorems. Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase AC circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections.

UNIT - II (18 Periods)

Electrical Machines:

Magnetic materials, BH characteristics, Construction, working of DC machines, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency.Auto-transformer and three-phase transformer connections.Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor.Single-phase induction motor. Construction and working of synchronous generators.

UNIT - III (18 Periods)

Semiconductor Diodes and applications:

Semiconductor materials, semiconductor diode, Resistance levels, Diode equivalent circuits, Zener diode,
Light emitting diode, Load line analysis, half wave rectification, Full wave rectification, Bridge rectifier, Use of capacitor filter in rectifier, Zener diode voltage regulator, Clippers, Clampers **Bipolar Junction Transistors:**
Transistor construction and operation, Common base configuration, Transistor amplifying action, Common emitter configuration, Common collector configuration, Limits of operation. DC load line and bias point, Voltage divider bias of transistor.

UNIT - IV (15 Periods)

Field Effect Transistors:

Construction and characteristics of JFET and MOSFET

Operational Amplifiers:

Introduction, Differential and common mode operation, OP-AMP Basics, Practical OP-AMP circuits:
Inverting amplifier, Non inverting amplifier, Unity follower, summing amplifier, Integrator and differentiator.

TEXT BOOKS:

1. S.K. Bhattacharya, “Basic Electrical and Electronics Engineering”, Pearson Publications
2. Robert L. Boylestad & Louis Nashelsky, ‘ Electronic Devices and circuit theory’, PHI Pvt.Limited,11th edition
3. “Basics of Electrical and Electronics Engineering”, Nagsarkar T K and Sukhija M S, Oxford pressUniversity Press.

REFERENCES:

1. David A. Bell, ‘Electronic Devices and Circuits’, oxford publisher,5th edition
2. “Basic Electrical, Electronics and Computer Engineering”, Muthusubramanian R, Salivahanan S andMuraleedharan K A, Tata McGraw Hill, Second Edition, (2006).

ENGINEERING GRAPHICS

I B.Tech – I Semester (18MEL01)

Lectures	:	1 Periods / Week	Tutorial	:	0	Practical	:	4
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

To learn

COB 1: Clear picture about the importance of engineering graphics in the field of engineering

COB 2: The drawing skills and impart students to follow Bureau of Indian Standards

COB 3: To give an idea about Geometric constructions, Engineering curves, orthographic projections and pictorial projections

COB 4: Imagination skills about orientation of points, lines, surfaces and solids

COB 5: Basic drafting skills of AutoCAD

Course Outcomes:

After the course the students are expected to be able to

CO 1: Draw projections of points and projections of lines using Auto CAD.

CO 2: Plot projections of surfaces like circle, square and rhombus.

CO 3: Plot the Projections of solids like Prisms and pyramids.

CO 4: Convert the of Orthographic views into isometric views of simple objects.

CO 5: Generate the of pictorial views into orthographic views of simple castings.

UNIT - I

INTRODUCTION: Introduction to Drawing instruments and their uses, geometrical construction procedures **INTRODUCTION TO AUTOCAD:** Basics of sheet selection, Draw tools, Modify tools, dimensioning **METHOD OF PROJECTIONS:** Principles of projection - First angle and third angle projectionof points. Projection of straight lines.Traces of lines.

UNIT - II

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

UNIT - III

PROJECTIONS OF SOLIDS: Projections of Cubes, Prisms, Pyramids, Cylinders and Cones Inclined to one plane.
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UNIT - IV

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

UNIT - V

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

TEXT BOOKS:

1. Engineering Drawing with AutoCAD by Dhananjay M. Kulkarni (PHI publication)
2. Engineering Drawing by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand). (Firstangle 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

ENGINEERING CHEMISTRY LABORATORY

Common to all branches

18CYL01

B.Tech.,(Semester- I)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

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 given salt by using Ion-exchange resin using Dowex-50.
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 Value(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 pH of given sample.
   (b) Determination of conductivity of given sample by conductometer.(c) Potentiometric Determination of Iron.

TEXT BOOKS:

1. Practical Engineering Chemistry by K.Mukkanti, Etal, B.S. Publicaitons, Hyderabad, 2009.
2. Inorganic quantitative analysis, Vogel, 5th edition, Longman group Ltd. London, 1979.

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.

WORKSHOP PRACTICE

18MEL02

B.Tech.,(Semester- I)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

Prerequisites: None.

Course Objectives: In this course students are able to

COB 1: To impart student knowledge on various hand tools for usage in engineering applications.

COB 2: Be able to use analytical skills for the production of components.

COB 3: Design and model different prototypes using carpentry, sheet metal and welding.

COB 4: Make electrical connections for daily applications.

COB 5: To make student aware of safety rules in working environments.

Course Outcomes: After the completion of this course the students are expected to be able to:

CO 1: Make half lap joint, Dovetail joint and Mortise &Tenon joint

CO 2: Produce Lap joint, Tee joint and Butt joint using Gas welding

CO 3: Prepare trapezoidal tray, Funnel and T-joint using sheet metal tools

CO 4: Make connections for controlling one lamp by a single switch, controlling two lamps by a single switch and stair case wiring.

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:

1. P.Kannaiah and K.L.Narayana, Workshop Manual, SciTech Publishers, 2009.
2. K. Venkata Reddy, Workshop Practice Manual, BS Publications, 2008

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Common to CSE,IT,ME

18EEL01

B.Tech.,(Semester- I)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Verification of Thevenin's theorem
4. Verification of Norton's theorem
5. Parameters of choke coil
6. Measurement of low and medium resistance using volt ampere method
7. OC & SC test of single phase transformer
8. Load test on single phase transformer
9. V-I characteristics of PN junction Diode
10. V-I characteristics of Zener Diode
11. Characteristics of CE Configuration
12. Transfer and Drain Characteristics of JFET
13. Calculation of Ripple factor using Half wave rectifier
14. Calculation of Ripple factor using Full wave rectifier
15. Non linear wave shaping – clippers/clampers

Note: Minimum 10 experiments should be carried.

NUMERICAL METHODS & ADVANCED CALCULUS

I B.Tech – II Semester (18MA002)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

none

Course Objectives:

CO1: To learn about some advanced numerical techniques e.g. solving a nonlinear equation, linear system of equations, Interpolation and Approximation techniques.

CO2: To learn about evaluation of double and triple integrals and their applications.

CO3: To learn some basic properties of scalar and vector point functions and their applications to line,surface and volume integrals.

Course Outcomes:

After the course the students are expected to be able to

CLO-1: Solve non-linear equations in one variable and system of linear equations using iteration methods.

CLO-2: Choose appropriate interpolation formulae based on the given data.

CLO-3: Compute the value of a definite integral using numerical integration techniques.

CLO-4: Predict the numerical solution of the derivative at a point from the given initial value problem using appropriate numerical method.

CLO-5: Evaluate the double and triple integrals using change of variables.

CLO-6: Transformline integrals to surface and surface to volume integrals and evaluate them.

UNIT - I **(12 Periods)**

Numerical Solution of Equations: Introduction; Solution of algebraic and transcendental equations: Bisection method, Method of false position, Newton-Raphson method; Useful deductions from the Newton-Raphson formula; Solution of linear simultaneous equations; Direct methods of solution: Gauss elimination method, Gauss-Jordan method, Factorization method; Iterative methods of solution: Jacobi's iterative method, Gauss-Seidel iterative method. (Sections: 28.1; 28.2; 28.3; 28.5; 28.6; 28.7.1;28.7.2).

UNIT - II **(12 Periods)**

Finite differences and Interpolation: Finite differences: Forward differences, Backward differences; Newton's interpolation formulae: Newton's forward interpolation formula, Newton's backward interpolation formula; Interpolation with unequal intervals; Lagrange's interpolation formula; Divided differences; Newton's divided difference formula; Numerical integration; Trapezoidal rule; Simpson's one-third rule; Simpson's three-eighth rule; Numerical solution of ODE's: Introduction; Picard's method; Euler's method; Runge-Kutta method.

(Sections:29.1; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30.8; 32.1; 32.2; 32.4; 32.7).

UNIT - III **(12 Periods)**

Multiple Integrals: Double integrals; Change of order of integration; Double integrals in polar coordinates; Area enclosed by plane curves; Triple integrals; Volumes of solids: Volume as Triple integrals, Change of variables. (Sections: 7.1; 7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2).

UNIT - IV **(14 Periods)**

Vector calculus and its Applications: Scalar and vector point functions; Del applied to scalar point functions-Gradient: Definition, Directional derivative; Del applied to vector point functions: Divergence, Curl; Line integral; Surfaces: Surface integral, Flux across a surface; Green's theorem in the plane (without proof); Stokes theorem (without proof); Gauss divergence theorem(without proof).
(Sections: 8.4; 8.5.1; 8.5.3; 8.6; 8.11; 8.12; 8.13; 8.14; 8.16)

TEXT BOOKS:

1. B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khanna publishers, 2017.

REFERENCES:

1. ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
2. N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

SEMICONDUCTOR PHYSICS

I B.Tech – II Semester (18PH001)

Lectures	:	4 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	4

Prerequisites:

none

Course Objectives:

CO1: This unit aim to build the foundation and inspires interest of freshmen into electrical and electronics and to focus on fundamental concepts and basic principles regarding electrical conduction.

CO2: This unit provides various properties of semiconductor materials and their importance in various device fabrications.

CO3: This unit aim to educate the student on various opto-electronic devices and their applications.

CO4: This unit provide information about the principles of processing, manufacturing and characterization of nanomaterials, nanostructures and their applications.

Course Outcomes:

After the course the students are expected to be able to

CLO1: understand concepts of band structure of solids, concept of hole and effective mass of electron in semiconductors.

CLO2: know the concept of Fermi level and various semiconductor junctions.

CLO3: familiar with working principles of various opto-electronic devices and their applications.

CLO4: understand importance of nano-materials and their characteristic properties.

UNIT - I }

ELECTRONIC MATERILAS:

Sommerfeld free electron theory, Fermi level and energy, density of states, Failure of free electron theory (Qualitative), Energy bands in solids, E-K diagrams, Direct and Indirect band gaps. Types of Electronic materials: Metals, Semi conductors and Insulators, Occupation Probability, effective mass, Concept of hole.

UNIT - II }

SEMICONDUCTORS:

Introduction to semiconductors, intrinsic and extrinsic semiconductors, carrier concentrations, Fermi level and temperature dependence, Continuity equation, Diffusion and drift, P-N junction (V-I characteristics), Metal – Semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for optoelectronic devices.

UNIT - III (12 Periods)

OPTO-ELECTRONIC DEVICES AND DISPLAY DEVICES:

Photo voltaic effect, principle and working of LED, Applications of Photo diode, Solar cell, PIN & APD Diode, Liquid crystal display, Opto electric effect: Faraday Effect and Kerr effect.

UNIT - IV (14 Periods)

NANO-MATERIALS:

Introduction to nano technology, quantum confinement, surface to volume ratio, properties of nano materials, synthesis of nano-materials: CVD, sol-gel methods, laser ablation.

Carbon nano tubes: types, properties, applications. Characterization of nano materials: XRD, SEM, applications of nano materials.

TEXT BOOKS:

1. A text book of engineering physics by Avadhanulu and KshirsagarS.Chand & Co. (2013)
2. Applied physics by Dr.P.SrinivasaRao. Dr.K.Muralidhar
3. Introduction to solid state state physics, Charles Kittel, 8th edition
4. Solid state physics, S.O. Pillai

REFERENCES:

1. Text book on Nanoscience and Nanotechnology (2013): B.S. Murty, P. Shankar, Baldev Raj, B.B.Rath and J. Murday, Springer Science & Business Media.
2. Basic Engineering Physics ,Dr.P.SrinivasaRao. Dr.K.Muralidhar. Himalaya Publications, 2016

PROFESSIONAL ETHICS & HUMAN VALUES

(Common to CSE and IT) **I B.Tech – II**

Semester (18IT203)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Student will be able to

CO1: Comprehend a specific set of behaviours and values any professional must know and must abide by, including confidentiality, honesty and integrity. Understand engineering as social experimentation.

CO2: Know, what are safety and Risk and understand the responsibilities and rights of an engineer such as collegiality, loyalty, bribes/gifts.

CO3: Recognize global issues visualizing globalization, cross-cultural issues, computer ethics and also know about ethical audit

CO4: Discuss case studies on Bhopal gas tragedy, Chernobyl and about codes of Institute of Engineers, ACM

Course Outcomes:

Student will be able to

CLO1: Comprehend a specific set of behaviours and values the professional interpreter must know and must abide by, including confidentiality, honesty and integrity

CLO2: Understand professional responsibilities and rights, prejudice in not asking for clarification, fear of law and plain neglect will lead to the occurrence of many repetitions of past mistakes

CLO3: Understand the responsibility of engineer to ensure safety of public by making risk-benefit analysis.

CLO4: Address the global issues that curbs ethics in environment and computer discipline. The students can speak out against issues in these areas affecting the public interest

CLO5: Understand the supplemented guidelines that are intended for decision making in the conduct of professional work

UNIT - I (14 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 - II (14 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 - III (14 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 - IV (14 Periods)

Case Studies: Bhopal Gas Tragedy, The Chernobyl Disaster.

Appendix1: Institution of Engineers (India): Sample Codes of Ethics. **Appendix2:** 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.

DIGITAL LOGIC DESIGN

(Common to CSE and IT) **I B.Tech – II**

Semester (18IT204)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: Design Have a thorough understanding of the fundamental concepts and techniques used in digital electronics, and The able to minimize boolean expressions by applying boolean algebra and k map methods.

COB 2: Design minimize circuit through Minimize boolean expressions by tabulation method.The ability to understand, analyze and design various combinational logic circuits.

COB 3: Design synchronous and asynchronous sequential circuits.

COB 4: Operate registers and counters, The ability to understand Memories and design Programmable Logic Devices.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand fundamental concepts and techniques used in digital electronics and minimize boolean expressions by applying boolean algebra and k-map methods.

CO 2: Minimize boolean expressions by tabulation method and understand, analyze and design various combinational logic circuits.

CO 3: Use basic flip-flops, analyze and design synchronous and asynchronous sequential circuits.

CO 4: Understand the Design principles of Registers, Counters, Memories and Programmable Logic Devices.

UNIT - I (14 Periods)

DIGITAL SYSTEMS AND BINARY NUMBERS: Digital System, Binary Numbers, Number base Conversions, Octal and Hexadecimal Numbers, Complements of Numbers, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic, Error Detection and Correction: 7 bit Hamming Code.

BOOLEAN ALGEBRA & LOGIC GATES: Introduction, Basic definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Boolean functions, Canonical and Standard Forms, Other Logic Operations, Digital logic gates.

GATE –LEVEL MINIMIZATION: Introduction, The map method, Four-variable K-Map, Product-of-Sums Simplification, Don't –Care Conditions, NAND and NOR implementation, Other Two level Implementations.

UNIT - II (14 Periods)

MINIMIZATION: The Tabulation method, Determination of prime implicants, Selection of prime-implicants.
COMBINATIONAL LOGIC: Introduction, Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adders - Subtractor, Decimal Adder, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT - III (14 Periods)

SYNCHRONOUS SEQUENTIAL LOGIC: Introduction, Sequential Circuits, Storage Elements - Latches, Storage Elements -Flip Flops, Analysis of Clocked Sequential Circuits: State Equations, State Table, State Diagram, Flip Flop Input Equations, Analysis with D, JK and T Flip Flops; State reduction and Assignment, Design Procedure.

UNIT - IV (14 Periods)

REGISTERS and COUNTERS: Registers, Shift registers, Ripple Counters, Synchronous Counters.
MEMORY and PROGRAMMABLE LOGIC: Introduction, Random Access Memory: Read and Write Operations, Types of Memories; Read Only Memory, Programmable Logic Devices: PROM, PLA, PAL.

TEXT BOOKS:

1. M. Morris Mano, Michael D. Ciletti, "Digital Design", 5th Edition, Prentice Hall, 2013.
2. A.Anandkumar, "fundamentals of digital circuits", 4th edition, phi.

REFERENCES:

1. John F. Wakerly, "Digital Design: Principles and Practices", 4th Edition, Pearson, 2006.
2. R. H. Katz, G. Borriello, "Contemporary Logic Design", 2nd Ed., Pearson Prentice-Hall, Upper SaddleRiver, NJ, 2005.
3. Brain Holdsworth , Clive Woods, "Digital Logic Design", 4th Edition, Elsevier Publisher, 2002.
4. Donald E Givone, "Digital Principles and Design", TMT.

COMMUNICATIVE ENGLISH

(Common to All) **I B.Tech – II Semester**

(18EL001)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	2

Prerequisites:

Course Objectives:

The Course Aims

COB 1: At enhancing the vocabulary competency of the students

COB 2: To enable the students to demonstrate proficiency in the use of written English, including proper spelling, grammar, and punctuation

COB 3: To enhance theoretical and conceptual understanding of the elements of grammar.

COB 4: Understand and apply the conventions of academic writing in English **COB 5:** To

enhance the learners' ability of communicating accurately and fluently

Course Outcomes:

After the course the students are expected to be able to

CO 1: Build academic vocabulary to enrich their writing skills.

CO 2: Make use of contextual clues to infer meanings of unfamiliar words from context.

CO 3: Produce accurate grammatical sentences.

CO 4: Distinguish main ideas from specific details.

CO 5: Produce coherent and unified paragraphs with adequate support and detail.

UNIT - I **(14 Periods)**

1. Text:
   (a) Study Skills for a Successful Semester (page 5)
   (b) Concerning the Unknown Engineer (page 27)
2. Grammar: Parts of Speech, Subject-Verb agreement
3. Vocabulary Development: Vocabulary in the lessons Study Skills for a Successful Semester andConcerning the Unknown Engineer
4. Writing Skills: Writing a Good Paragraph with Notes, Writing a cohesive text, clutter free writing.

UNIT - II (14 Periods)

1. Text:
   (a) A Shadow by R.K.Narayanan (page no116)
   (b) Clutter (page no 69)
2. Grammar: Tenses.
3. Vocabulary Development: Vocabulary in the lessons A Shadow and Clutter.
4. Writing Skills: Essay Writing.

UNIT - III (14 Periods)

1. Text:
   (a) Bionics (pg.no:157)
   (b) Primping the pump by Zig Ziglar (Pg.No: 138)
2. Grammar: Auxiliary Verbs, Conditionals, Articles and Determiners.
3. Vocabulary Development: Vocabulary in the lessons Bionics and primping the pump by Zig Ziglar.4. Writing Skills: Letter writing, E-Mail writing

UNIT - IV (14 Periods)

1. Text:
   (a) Human Cloning (Pg.no 194)
   (b) The Stranger within (Pg.No: 237)
2. Grammar: Voice, Reported Speech, Gerund
3. Vocabulary Development: Vocabulary in the Lessons Human Cloning and the Stranger Within.
4. Writing Skills: Abstract, Proposal and executive summary writing on Technical basis.

TEXT BOOKS:

1. “Innovate with English” by T.Samson, First Edition,Cambridge University Press: New Delhi.

REFERENCES:

1. “Practical English Usage” by Michael Swan, 3rd Edition, OUP.
2. “Intermediate English Grammar” by Raymond Murphy, CUP.
3. “Study: Reading” by Eric H .Glendinning, 2nd Edition CUP.
4. “Business Correspondence and Report writing” by R.C Sharma, Tata McGrawhill.

PROBLEM SOLVING WITH PROGRAMMING

(Common to All) **I B.Tech – II Semester**

(18CS001)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: Understand basic concepts of C Programming such as: C-tokens, Operators, Input/output, and Arithmetic rules.

COB 2: Develop problem solving skills to translate 'English' described problems into programs written using C language. written using C language.

COB 3: Use Conditional Branching, Looping, and Functions.

COB 4: Apply pointers for parameter passing, referencing and differencing and linking data structures.

COB 5: Manipulate variables and types to change the problem state, including numeric,character, array and pointer types, as well as the use of structures and unions, File.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Choose and Analyze the right data representation formats and algorithms to solve the problem.

CO 2: Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand.

CO 3: Write the program on a computer, edit, compile, debug, correct, recompile and run it.

CO 4: Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

UNIT - I (14 Periods)

Overview of C, Constants, Variables and Data Types, Operators and Expressions,Managing I/O Operations. Decision Making and Branching.

Programming Exercises for Unit I:C-expressions for algebraic expressions, evaluation of arithmetic and Boolean expressions. Syntactic and logical errors in a given program, output of a given program, values of variables at the end of execution of a program fragment, 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, finding given year is leap year or not, and conversion of lower case character to its upper case.

UNIT - II (14 Periods)

Decision Making and Looping, Arrays, Character Arrays and Strings.

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. 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 with and without using String Handling Functions. Transpose of a matrix and sorting of names using arrays.

UNIT - III (14 Periods)

User-defined Functions,Structures and Unions,Pointers

Programming Exercises for Unit - III: Functions - Recursive functions to find factorial & GCD (Greatest Common Divisor), string operations using pointers and pointer arithmetic. Swapping two variable values. Sorting a list of student records on register number using array of pointers

UNIT - IV (14 Periods)

File Management in C,Dynamic Memory Allocation,Preprocessor

Programming Exercises for Unit - IV: Operations on complex numbers, and to read an input file of marks and generate a result file, sorting a list of names using command line arguments. Copy the contents of one file to another file. Allocating memory to variables dynamically.

TEXT BOOKS:

1. Programming in ANSI C by E.Balaguruswamy,Fifth 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. Herbert Schildt, “C: The Complete Reference”, 4th edition, Tata Mcgraw-Hill. Ashok N.Kamthane,“Programming in C”, PEARSON 2nd Edition.

SEMICONDUCTOR PHYSICS LAB

(Common to All)

I B.Tech – II Semester (18PHL01)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

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'sapparatus.
3. Determination of thickness of thin wire using air wedge interference bands.
4. Determination of wavelengths of mercury spectrum using grating normal incidence method.
5. Determination of dispersive power of a given material of prism using prism minimum deviation method.
6. Draw the resonant characteristic curves of L.C.R. series circuit and calculate the resonant frequency.
7. Draw the characteristic curves of a photocell and calculate the maximum velocity of electron.
8. Verify the laws of transverse vibration of stretched string using sonometer.
9. Determine the rigidity modulus of the given material of the wire using Torsional pendulum.
10. Draw the load characteristic curves of a solar cell.
11. Determination of Hall coefficient of a semiconductor.
12. Determination of voltage and frequency of an A.C. signal using C.R.O.
13. Determination of Forbidden energy gap of Si & Ge.
14. Determination of wavelength of laser source using Diode laser.

Any three experiments are virtual

TEXT BOOKS:

1. Engineering physics laboratory manual P.Srinivasarao & K.Muralidhar,Himalaya publications.

COMMUNICATION SKILLS LAB

I B.Tech – II Semester (18ELL01)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. UNIT-1

   (a) Listening Skills; Importance – Purpose- Process- Types
   (b) Barriers to Listening
   (c) Strategies for Effective Listening

2. UNIT-II

   (a) Phonetics; Introduction to Consonant, Vowel and Diphthong sounds
   (b) Stress
   (c) Rhythm
   (d) Intonation

3. UNIT-III

   (a) Formal and Informal Situations
   (b) Expressions used in different situations
   (c) 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

4. UNIT-IV

   (a) JAM Session
   (b) Debates
   (c) Extempore

REFERENCE BOOKS:

1. Communication Skills, Sanjay Kumar and PushpaLata. Oxford University Press. 2011
2. Better English Pronunciation, J.D. O' Connor. Cambridge University Press:1984
3. New Interchange (4rth Edition), Jack C Richards. Cambridge University Press:2015 4. English Conversation Practice, Grant Taylor. McGraw Hill:2001

SOFTWARE

1. Buzzers for conversations, New Interchange series
2. English in Mind series, Telephoning in English
3. Speech Solutions, A Course in Listening and Speaking

PROBLEM SOLVING WITH PROGRAMMING LAB

(Common to All)

I B.Tech – II Semester (18CSL01)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

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 – 100	0.50 per unit
101 – 200	50 plus 0.6 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) $1 + \frac{x^2}{2!} + \frac{x^4}{4!} +$…upto ten terms
   (b) $x + \frac{x^3}{3!} + \frac{x^5}{5!} +$ … 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 searchalgorithm 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 a student 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 detailssuch 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.

COMPUTER ORGANIZATION & ARCHITECTURE

18IT301 B.Tech.,(SemesterIII)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Digital Logic Design(18IT204)

Course Objectives:

Students will be able to

COB 1: Conceptualize the basics of organizational and architectural issues of a digital computer and Classify and compute the performance of machines, Machine Instructions.

COB 2: Learn about various data transfer techniques in digital computer and the I/O interfaces.

COB 3: Estimate the performance of various classes of Memories, build large memories using small memories for better performance and Relate to arithmetic for ALU implementation

COB 4: Understand the basics of hardwired and micro-programmed control of the CPU, pipelined architectures , Hazards and Superscalar Operations.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explain the basics of organizational and architectural issues of a digital computer and Classify and compute the performance of machines, Machine Instructions.

CO 2: Describe various data transfer techniques in digital computer and the I/O interfaces.

CO 3: Analyze the performance of various classes of Memories, build large memories using small memories for better performance and analyze arithmetic for ALU implementation

CO 4: Describe the basics of hardwired and micro-programmed control of the CPU, pipelined architectures , Hazards and Superscalar Operations

UNIT - I (17 Periods)

Basic Structure Of Computers: Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers. (8 Periods)

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.(9 Periods)

UNIT - II **(15 Periods)**

Input/Output Organization: Interrupts, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces: PCI Bus, SCSI Bus, USB Bus. (15 Periods)

UNIT - III **(17 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. (9 Periods)

Arithmetic: Addition and Subtraction of Signed Numbers, Multiplication of Positive numbers, Signed operand multiplication, Fast multiplication, Integer Division, Floating point numbers and operations.(8 Periods)

UNIT - IV **(15 Periods)**

Basic Processing Unit: Some fundamental concepts, Execution of a complete instruction, Multiple –Bus Organization, Hardwired control, Micro programmed control. (7 Periods)

Pipelining: Basic Concepts, Data Hazards, Instruction hazards, Influence on Instruction Sets, Data path and Control Considerations, Superscalar Operation, performance Considerations.(8 Periods)

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

DATA STRUCTURES

II B.Tech III Semester (18IT302)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Problem Solving with Programming

Course Objectives:

Students will be able to

CO1: Understand and remember algorithms and its analysis procedure and Compute the complexity of various algorithms.

CO2: Introduce the concept of data structures through ADT including List, Stack, Queues, dynamic equivalence problem and smart union algorithm.

CO3: Understand the concept of Binary tree, binary search tree,AVL tree and their applications.

CO4: Learn Hashing,graph representations and traversal methods.

Course Outcomes:

After the course the students are expected to be able to

CLO1: Determine the time complexities of different algorithms, and implement ADTâ€™s of different types of linked lists and applications.

CLO2: Implement stack and queue ADTâ€™s using arrays and linked lists and their applications.

CLO3: Construct and implement different tree algorithms.

CLO4: Implement and analyze various hashing techniques and Graph traversal methods.

UNIT - I **(14 Periods)**

Algorithm Analysis: Mathematical Background, 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 - II (14 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.

Basic Sorting Techniques: Bubble sort, Selection sort, Insertion sort, Shell sort

UNIT - III (13 Periods)

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

UNIT - IV (13 Periods)

Hashing: General Idea, Hash Function, Separate Chaining, Open Addressing.

Priority Queues (Heaps): Model, Simple implementations, Binary Heap, Heap Sort.

Disjoint Set ADT: Dynamic equivalence problem, Basic Data Structure, Smart Union Algorithms, Path Compression.

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, â€œData Structures and Algorithms, Pearson Education Asia,1983.

Discrete Mathematical Structures

II B.Tech III Semester (18IT303)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

CO1: Understand set theory, relations and functions to read , understand Mathematical Induction and construct mathematical arguments.

CO2: Understand combinatorics,logic and mathematical reasoning to count or enumerate objects in systematic way.

CO3: Construct recurrence relations for elementary problems, and Apply generating functions to solve recurrence relations.

CO4: Understand the concept of lattices and graph theory.

Course Outcomes:

After the course the students are expected to be able to

CLO1: Verify the correctness of an argument using propositional and predicate logic and truth tables.

CLO2: Demonstrate the ability to solve problems using counting techniques and combinatorics in the context of discrete probability.

CLO3: Solve problems involving recurrence relations and generating functions.

CLO4: Understand some basic properties of graphs and related discrete structures, and be able to relate these to practical examples.

UNIT - I **(16 Periods)**

Set Theory: Sets and subsets, Venn Diagrams, Operations on sets, laws of set theory, Power sets and products, Partition of sets, The principle of inclusion - Exclusion.

Relations: Definition, Types of relation, Composition of relations, Domain and range of a relation, Representation of Relations, Operations of relation, Special properties of a binary relation, Equivalence Relations and Partial Ordering Relations , POSET diagram and lattice, Paths and Closures.

Functions: Definition and types of functions, Composition, Inverse and Identity of functions.

UNIT - II (15 Periods)

Logic: 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. **Elementary Combinatorics:** Basics of Counting, Combinations and Permutations,Enumerating Combinations and Permutations with repetitions.

UNIT - III (15 Periods)

Recurrence relations: Generating functions of sequences, Calculating Coefficients of Generating Functions. Solving recurrence relations by Substitution and generating functions. The methods of characteristic roots, solutions of inhomogeneous recurrence relations.

UNIT - IV (14 Periods)

Graphs: Basic concepts, Directed Graphs and Adjacency Matrices, Application: Topological Sorting.Isomorphisms and Subgraphs, Planar Graphs, Eulerâ€™s Formula; Multigraphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four Color Problem.

TEXT BOOKS:

1. Joe L.Mott, Abraham Kandel & Theodore P.Baker, Discrete Mathematics for Computer Scientists &Mathematicians, PHI 2nd edition.
2. Ralph P. Grimaldi: Discrete and Combinatorial Mathematics, , 5th Edition, Pearson Education. 2004.

REFERENCES:

1. Basavaraj S Anami and Venakanna S Madalli: Discrete Mathematics â€“ A Concept based approach,Universities Press, 2016.
2. Kenneth H. Rosen: Discrete Mathematics and its Applications, 6th Edition, McGraw Hill, 2007.
3. D.S. Malik and M.K. Sen: Discrete Mathematical Structures: Theory and Applications, Thomson,2004.
4. Thomas Koshy: Discrete Mathematics with Applications, Elsevier, 2005, Reprint 2008.

OBJECT ORIENTED PROGRAMMING

18IT304 B.Tech.,(SemesterIII)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Problem solving with programming (18CS001)

Course Objectives:

COB 1: This course provides an introduction to object oriented programming (OOP) features encapsulation, abstraction and inheritance using the Java programming language.

COB 2: Understand the concept of Packages and Exception handling.

COB 3: Implement java applications using applets and events.

COB 4: Understand the AWT and Swing concepts in java.

COB 5: Be able to use the Java SDK environment to create, debug and run simple Java programs.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand fundamentals of java programming such as variables, conditional and iterative execution, methods, etc.

CO 2: Understand the principles of inheritance.

CO 3: Analyze the concept of exception handling mechanism.

CO 4: Design the java applications using Java applet and Event handling and develop java applications using AWT and Swings.

UNIT - I (15 Periods)

The History and Evolution of Java, An Overview of Java,Data Types,Variables and Arrays,Operators,Control Statements,Introducing Classes,A Closer Look at Methods and Classes.

UNIT - II (15 Periods)

Inheritance

Packages and Interfaces

Strings: String Constructors, Program using 10 String methods StringBuffer class, Program using 10 StringBuffer methods Introducing StringBuilder class.

Type Wrappers: Auto boxing/unboxing.

Collections: Collections Overview, Names of Collection Interfaces, Classes. Programs using Collection classes LinkedList <String>, ArrayList < String >

UNIT - III **(15 Periods)**

Exception Handling

Multithreaded Programming

I/O: I/O Basics, Reading Console Input, Writing Console Output, The PrintWriter class, Reading and Writing Files, Automatically Closing a File

UNIT - IV **(15 Periods)**

The Applet Class: Two Types of Applets, Applet Basics, Applet Architecture, An Applet Skeleton, Simple Applet Display Methods, Requesting Repainting, Using the Status Window, The HTML APPLET Tag, Passing Parameters to Applets, getDocumetBase(), getCodeBase(), Introducing Graphics and Color classes.

Event Handling:

AWT:basics, Program using AWT components Label, TextField, TextArea, Choice, Checkbox, CheckboxGroup, Button, Program using FlowLayout, GridLayout, BorderLayout. Advantages of Swing over AWT, Program using Swing Components JTable, JTree, JComboBox .

TEXT BOOKS:

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

REFERENCES:

1. Big Java, 2nd Edition, Cay Horstmann, John Wiley and Sons,Pearson Education.
2. Java How to Program (Early Objects), Tenth Edition, H.M.Dietel and P.J.Dietel, Pearson Education.

OPERATING SYSTEMS

18IT305 B.Tech.,(SemesterIII)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: Have a thorough understanding of the fundamentals of Operating Systems

COB 2: Learn the mechanisms of OS to handle processes and threads and their communication

COB 3: Learn the mechanisms involved in memory management in contemporary OS and Gain knowledge on Mutual exclusion algorithms, deadlock detection algorithms **COB 4:** Gain knowledge on file I/O operations and protection of various OS.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand different structures, services of the operating system and the use of scheduling and operations on process.

CO 2: Understand the use of scheduling, operations on process, the process scheduling algorithms and synchronization concepts.

CO 3: Understand the concepts of deadlock, memory and virtual memory management techniques.

CO 4: Understand the concepts of File System, Input/output systems and system protection of various operating systems.

UNIT - I (14 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, //Thread Libraries, //Issues.

UNIT - II (14 Periods)

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, //Thread Scheduling, //Multiple-Processor Scheduling, OS Examples, Algorithm Evaluation.

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

UNIT - III (14 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 - IV (14 Periods)

File systems: File Concept, Access Methods, Directory and Disk Structure, **File Sharing.**

I/O, Protection?

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.

TECHNICAL ENGLISH

18EL002 B.Tech.,(SemesterIII)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	2

Prerequisites:

Course Objectives:

The course aims

COB 1: At enhancing the vocabulary competency of the students.

COB 2: To introduce corrective measures to eliminate grammatical errors in speaking and writing.

COB 3: To learn writing as a process, including various invention heuristics *suchasbrainstorming*, gathering evidence, considering audience, drafting, revising, editing, and proofreading.

COB 4: Use grammatical, stylistic, and mechanical formats and conventions appropriate for a variety of purposes.

COB 5: Produce coherent, organized, readable prose for a variety of rhetorical situations.

Course Outcomes:

By the end of the course the student would be able to

CO 1: Build academic vocabulary to enrich their writing skills

CO 2: Make use of contextual clues to infer meanings of unfamiliar words from context.

CO 3: Participate actively in writing activities (individually and in collaboration) that model effective technical communication in the workplace.

CO 4: Understand how to apply technical information and knowledge in practical documents for a variety of purposes.

CO 5: Practice the unique qualities of professional writing style that includes sentence conciseness, readability, clarity, accuracy, honesty, avoiding wordiness or ambiguity, previewing, using direct order organization, objectivity, unbiased analyzing, summarizing, coherence and transitional devices.

UNIT - I (14 Periods)

1.1 Vocabulary Development: Familiarising Idioms & Phrases

1.2 Grammar for Academic Writing: Making Requests

1.3 Language Development: Using Transition & Link words

1.4 Technical Writing: Letter Writing & Email Writing

UNIT - II (14 Periods)

2.1 Vocabulary Development: Analogous words, Gender Sensitive language

2.2 Grammar for Academic Writing: Tenses: Simple Past /Present Perfect, The Future: Predicting & Proposing

2.3 Language Development: Cloze tests

2.4 Technical Writing: Technical Reports

UNIT - III (14 Periods)

3.1 Vocabulary Development: Abbreviations & Acronyms

3.2 Grammar for Academic Writing: Describing(People/Things/Circumstances) : Adjectival & Adverbial groups

3.3 Language Development: Transcoding (Channel conversion from chart to text)

3.4 Technical Writing: Circular, Memos, Minutes of Meeting

UNIT - IV (14 Periods)

4.1 Vocabulary Development: Corporate vocabulary

4.2 Grammar for Academic Writing: Inversions & Emphasis

4.3 Language Development: Reading Comprehension

4.4 Technical Writing: Resume Preparation

REFERENCES:

1. Communication Skills, Sanjay Kumar & Pushpa Latha. Oxford University Press: 2011.
2. Technical Communication Principles and Practice. Oxford University Press: 2014.
3. Advanced Language Practice, Michael Vince. MacMilan Publishers: 2003.
4. Objective English (Third Edition), Edgar Thorpe & Showick. Pearson Education: 2009
5. English Grammar: A University Course (Second Edition), Angela Downing & Philip Locke, RoutledgeTaylor & Francis Group: 2016

DATA STRUCTURES LAB

18ITL32

II B.Tech.,(Semester- III)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Write a program to perform the following operations on Array List 1.Creation,2.Insertion, 3.Deletion, 4.Search, 5.Display.
2. 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 using array list.
3. Write a program to perform the following operations on Single Linked List. a)Creation b)Insertionc)Deletion d)Search e)Display.
4. Write a program to perform the following operations on Doubly Linked List. a)Creation b)Insertionc)Deletion d)Search e)Display.
5. Write a program to perform addition and multiplication of two polynomials using single Linked List.
6. Write a program to implement the following using stack. a) infix to postfix conversion b) postfixevaluation
7. Write a program that performs Radix sort on a given set of elements using queue.
8. Write a program to perform the following operations on Disjoint Set. a)Make-Set b)Find-Set c)Union.
9. Write a program to read n numbers in an array. Redisplay the arraylist with elements being sortedin ascending order using Heap Sort.
10. Write a program to demonstrate Binary Expression tree.
11. Write a program to perform Binary Search tree operations and traversals.
12. Write a program to implement AVL tree that interactively allows (a) Insertion (b)Deletion (c) Find_min (d) Find_max.
13. Write a program to implement DFS & BFS graph traversing techniques.
14. Write a program to find an element using Open Addressing.

OBJECT ORIENTED PROGRAMMING LAB

18ITL32

B.Tech.,(Semester- IV)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EPERIMENTS

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.

Operating Systems Lab

18ITL33

B.Tech.,(Semester- III)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Write a program to simulate Inter Process Communication & Threading.
2. Write a program to simulate the following non pre-emptive CPU scheduling algorithms to findturnaround time and waiting time. a) FCFS b) SJF c) Round Robin (pre-emptive) d) Priority
3. Write a Program to simulate the concept of Dining-Philosophers problem.
4. Write a program to simulate producer-consumer problem using semaphores.
5. Write a program to simulate Bankers Algorithm for deadlock avoidance.
6. Write a program to simulate Deadlock Detection algorithm.
7. Write a Program to simulate the MVT and MFT memory management techniques.
8. Write a program to simulate the following Contiguous Memory Allocation techniques: a) worst-fit b) best-fit c) first-fit
9. Implement Paging technique of memory management.
10. Write a program to simulate the following page replacement algorithms: a) FIFO b) LRU c) LFU

PROBABILITY & STATISTICS

II B.Tech – II Semester (18MA003)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1:

COB 2:

COB 3:

COB 4:

Course Outcomes:

After the course the students are expected to be able to

CO 1:

CO 2:

CO 3:

CO 4:

UNIT - I **(12 Periods)**

Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Gamma Distribution and its applications, Beta Distribution and its applications, Joint Distributions (Discrete),Joint Distributions (Continuous).Populations and Samples, Law of large numbers,Central limit theorem and its applications,The sampling distribution of the mean (unknown),The sampling distribution of the variance. (Sections 5.1, 5.2, 5.3, 5.5,5.7, 5.8, 5.10, 6.1, 6.2, 6.3, 6.4 of Text Book (1))

UNIT - II **(12 Periods)**

Point estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests of hypotheses, Hypothesis concerning one mean, Comparisons-Two independent Large samples, Comparisons-Two independent small samples, Paired sample t test. (Sections 7.1,7.2, 7.4, 7.5, 7.6, 8.2, 8.3, 8.4 of Text Book (1))

UNIT - III **(12 Periods)**

The estimation of variances,Hypotheses concerning one variance,Hypotheses concerning two variances, Estimation of proportions, Hypotheses concerning one proportion, Hypotheses concerning several proportions, Procedure for Analysis of Variance (ANOVA) for comparing the means of k (¿2) groups- one way classification(Completely randomized designs), Procedure for Analysis of Variance (ANOVA) for comparing the means of k (¿2) groups- two way classification(Randomized block designs). (Sections 9.1, 9.2, 9.3, 10.1, 10.2, 10.3, 12.2, 12.3 of Text Book (1))

UNIT - IV **(12 Periods)**

Multivariate Analysis: The concept of bivariate relationship, scatter diagram, Pearsons correlation and correlation matrix. Simple linear regression model and assumptions, Least Squares Estimation of the parameters of the model, Testing the significance of the model. Regression versus Correlation, Multiple linear regressionmodel with k explanatory variables and assumptions of the model. Least Square Estimation of regression coefficients. Concept of the coefficient of determination . Test for significance of the regression model and individual regression coefficients.Applications of multiple regression analysis. (1st and 2nd Chapters of Text Book [2])

TEXT BOOKS:

1. 1. Miller & Freunds Probability and Statistics for Engineers, Richard A. Johnson, 8th Edition, PHI.
2. Introduction to Linear Regression Analysis, Douglas C. Montgomery, E.A. Peck and G.G. Vining,3rdedition, Wiley.

REFERENCES:

1. 1. R.E Walpole, R.H. Myers & S.L. Myers Probability & Statistics for Engineers and Scientists, 6thEdition, PHI.
2. 2. Fundamentals of Mathematical Statistics, S.C.Gupta and V.K.Kapoor,11th Edition, Sultan Chand & Sons.
3. 3. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, Probability & Satistics, Schaums outline series.
4. 4. K.V.S.Sarma,Statistics Made Simple Do it yourself on PC,Prentice Hall India, Second Edition, 2015.

WEB TECHNOLOGIES

II B.Tech – II Semester (18IT402)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: Analyze a web page and identify HTML elements and their attributes.

COB 2: Build dynamic web pages using JavaScript (client side programming).

COB 3: Write a well formed / valid XML documents.

COB 4: Understand Web server and its working also working with Ajax for asynchronous communication.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Design web pages with different elements and attributes.

CO 2: Build websites with dynamic functionality using javascript.

CO 3: Identify the functionality of XML and create an XML document and display data from XML document.

CO 4: Recognize the use of web servers and know the functionality of web servers.

UNIT - I **(15 Periods)**

Introduction to HTML5 Part I, Introduction to HTML5 Part II, Cascading Style Sheets I, Cascading Style Sheets II, JavaScript: Introduction to Scripting, Control Statements I, Control Statements II, Functions, Arrays.

UNIT - II **(15 Periods)**

JavaScript: Objects, Dynamic HTML: Document Object Model and Collections, Event Model, HTML5 Introduction to Canvas

UNIT - III **(15 Periods)**

XML: Introduction, XML Basics, Structuring data,XML Namespaces, DTD, XSD, XSL Transformations

UNIT - IV **(15 Periods)**

Building Ajax-Enabled Web Applications, Web Servers (IIS and Apache), Working with JQuery

Programming Exercises for Unit - IV:

TEXT BOOKS:

1. 1. Harvey M. Deitel and Paul J. Deitel,"Internet & World Wide Web How to Program", 5/e, PHI.
2. 2. Kogent Learning Solutions Inc.,HTML5 Black Book: "Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and Jquery".

REFERENCES:

1. 1. Jason Cranford Teague, "Visual Quick Start Guide CSS, DHTML & AJAX", 4e, Pearson Education.
2. 2. Tom NerinoDoli smith, "JavaScript & AJAX for the web", Pearson Education 2007.
3. 3. Joshua Elchorn, "Understanding AJAX", Prentice Hall 2006.

DATABASE MANAGEMENT SYSTEM

II B.Tech – IV Semester (18IT403)

Lectures	:	4 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: Describe the fundamental elements of relational database management systems.

COB 2: Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

COB 3: Design ER-models to represent simple database application scenarios.

COB 4: Improve the database design by normalization.

COB 5: Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B trees and B+ trees.

COB 6: Familiar with basic concurrency control techniques and recovery techniques.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Ability to apply knowledge of database design methodology which give a good formal foundation in relational data model and Understand and apply the principles of data modeling using ER Model.

CO 2: Familiar with relational DB theory and will able to write relational algebra expressions, Relational Calculus and SQL.for query

CO 3: Design database schema and Identify and solve the redundancy problem in database tables using normalization.

CO 4: Understand transaction processing, concurrency control and recovery techniques.

UNIT - I (17 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.Database System Concepts and Architecture : DataModels, Schemas and Instances ,Three-Schema Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment, Centralized and Client/Server Architectures for DBMSs.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 - II **(17 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.

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 - III **(18 Periods)**

Indexing Structures for Files: Types of Single-Level Ordered Indexes, Multilevel Indexes - Dynamic Multilevel Indexes Using B-Trees and B+-Trees. 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 -Lossless Join Decomposition and Dependency Preserving Decomposition, Algorithms for Relational Database Schema Design, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

UNIT - IV **(18 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, 6th edition.

REFERENCES:

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

SCRIPT PROGRAMMING

II B.Tech – II Semester (18IT404)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: Basic Programming Constructs

Course Objectives:

Students will be able to

CO1: Identify syntaxes and semantics of Python.

CO2: to create scripts that can be used in different applications in relevant scenarios.

CO3: study object oriented concepts of Python.

CO4: Handle exceptions and connect with database to perform CRUD operations

Course Outcomes:

After the course the students are expected to be able to

CLO1: Write scripts with basic python constructs and using control flow.

CLO2: Identify the usage of functions and write scripts using functions.

CLO3: Use different data stuctures like tuples,lists and dictionaries.

CLO4: Handle exceptions while writing scripts using exception handling techniques in python.

CLO5: Write scripts with object oriented concepts like inheritance and encapsulation.

CLO6: Write scripts that can work on files and directories.

CLO7: Write scripts for performing searching using Regular expressions

UNIT - I (14 Periods)

Introduction to Python: Knowledge, Machines, Languages, Types, Variables Operators and Branching –– Core elements of programs: Bindings, Strings, Input/Output, IDEs, Control Flow, Iteration, Functions: Decomposition and Abstraction, Functions and Scope, Keyword Arguments, Iteration vs Recursion, Modules, Files

UNIT - II (14 Periods)

Structures types, Mutability and Higher order functions: Tuples, Lists and Mutability, Dictionaries, Exceptions and Assertions: Handling Exceptions, Exceptions as a Control Flow Mechanisms, Object Oriented Python: Abstract data types and classes, Inheritance, Encapsulation and Information Hiding.

UNIT - III **(14 Periods)**

PERL: Introduction, Scalar Variables, Lists and Arrays, Subroutines, Input and output, Hashes, Matching Regular Expressions, Processing Text with Regular Expressions

UNIT - IV **(14 Periods)**

Perl Modules, Directory Operations, Strings and sorting, Object oriented Perl

TEXT BOOKS:

1. 1. Introduction to Computation and Programming using Python, by John Guttag, PHI Publisher, Revised and Expanded version (Referred by MIT).
2. 2. Learning Perl 5th edition, Randal L. Schwartz, Tom Phoenix, and brian d foy, O'reilly Publisher.

REFERENCES:

1. 1. Learning Python 5th edition by Mark Lutz-O'reilly publcations.
2. 2. Python Programming for absolute beginners-3rd edition (Web downloads available)

COMPUTER NETWORKS

II B.Tech – II Semester (18IT405)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: Able to learn the architectural principles of data communications and computer networking.

COB 2: To learn the network layer design and routing algorithms,congestion control and quality of services

COB 3: Able to know the Transport layer and transport layer protoclols

COB 4: To gain the knowledge on DNS,E-mail and world wide web networking application

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand the architectural principles of data communications and computer networking

CO 2: Understand the network layer design and routing algorithms,congestion control and quality of services

CO 3: Understand the Transport layer and transport layer protoclols

CO 4: Understand the knowledge on DNS,E-mail and world wide web networking application

UNIT - I (14 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 - II (14 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 - III **(14 Periods)**

TheTransportLayer:ServicesProvidedtotheUpperLayers,TransportServicePrimitives,Berkeleysockets 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, TCPTransmissionPolicy, TCPCongestionControl, TCPTimerManagement. .

UNIT - IV **(14 Periods)**

Application Layer: The Domain Name System (DNS): The DNS Name Space, Resource Records, And 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,“DataCommunications and Networking”,4th edition, TMH.
2. Tanenbaum,“Computer Networks”,5thEdition,PearsonEducation,2011.

REFERENCES:

1. WayneTomasi,“Introduction to DataCommunications and Networking”,PHI Publications
2. God Bole,“DataCommunications & Networking”,TMH Publications.
3. Kurose & Ross, “COMPUTER NETWORKS– A Top-down approach featuring the Internet”, PearsonEducation,AlbertoLeon,Garciak.

DESIGN & ANALYSIS OF ALGORITHMS

II B.Tech – II Semester (18IT406)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Discrete Mathematics

Course Objectives:

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

COB 1: Understand about designing and effectiveness of an algorithm, and divide and conquer method.

COB 2: Understand the optimal solution finding with the greedy and dynamic programming method

COB 3: Easy know the major graph algorithms and their analyses, and backtracking information.

COB 4: Get the ability to branch with bound value and NP problems.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explains Algorithm design and efficiency and master theorem **CO 2:**

Solve divide and conquer and greedy problems.

CO 3: Design the algorithms like dynamic and graph type tasks.

CO 4: Recognize the solutions for back tacking and branch and bound and also NP problems.

UNIT - I (14 Periods)

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh-notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis

Master Theorem: Introduction, Generic Form- Case1, Case2, Case3, Inadmissible equations, Application to common algorithms

UNIT - II (16 Periods)

Divide and conquer : General method , applications - Quick sort, Merge sort, Strassen's matrix multiplication.

Greedy method : General method, applications-Job sequencing with deadlines, Fractional knapsack problem, Minimum cost spanning trees - Prims, Kruskal, Single source shortest path problem - Dijkstra.

UNIT - III (15 Periods)

Dynamic Programming: General method, applications - 0/1 knapsack problem, Travelling salesperson problem, Longest common sequence algorithm, Multistage graphs using Forward & Backward approach,
Reliability design.

textbfGraph Searching and Traversal: Graph traversals - Depth first, Breadth first, Bio Connected Components, Strongly Connected Components.

UNIT - IV (15 Periods)

textbfBack tracking: General method, applications-n-queen problem, sum of subsets problem.

Branch and Bound: General method, applications - 0/1 knapsack problem- LC Branch and Bound solution.
NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP-Hard and NP Complete classes, Cook's theorem.

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 Wesl

WEB TECHNOLOGIES LAB

18ITL41 B.Tech.,(Semester- IV)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Design web pages to demonstrate different types of styles in CSS.
2. Write java scripts covering Function, recursive functions, Arrays and Objects.
3. Demonstrate collection objects.
4. Demonstrate event model.
5. Write well-formed and valid XML documents.
6. Write code for displaying XML using XSL.
7. Demonstrate Document Object Model for an XML document.
8. Demonstrate web applications using AJAX9. Installation of IIS and Apache Tomcat servers
9. Demonstrate web applications using Jquery.

RDBMS Lab

II B.Tech – II Semester (18ITL42)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. **Working with DDL, DML, DCL and Key Constraints**
   Creation, Altering and Dropping of Tables and Inserting Rows into a Table (Use Constraints While Creating Tables) Examples Using Select Command.
2. **Working with Queries and Nested QUERIES**
   Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
3. **Working with Queries USING Aggregate Operators & views**
   Queries using Aggregate Functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and Dropping of Views.
4. **Working with Conversion Functions & String Functions**
   Queries using Conversion Functions (TO_CHAR, TO_NUMBER AND TO_DATE), String Functions (CONCATENATION, LPAD, RPAD, LTRIM, RTRIM, LOWER, UPPER, INITCAP, LENGTH, SUBSTR AND INSTR), Date Functions (SYSDATE, NEXT_DAY, ADD_MONTHS, LAST_DAY, MONTHS_BETWEEN), LEAST, GREATEST, TRUNC, ROUND, TO_CHAR, TO_DATE.
5. **Working with LOOPS using PL/SQL**
   Program Development using WHILE LOOPS, FOR LOOPS, Nested Loops using ERROR Handling. 6. **Working with Functions Using PL/SQL**
   Program Development using Creation of Stored Functions, Invoke Functions in SQL Statements and Write Complex Functions.
7. **Working with Stored Procedures**
   Programs Development using Creation of Procedures, Passing Parameters IN and OUT of PROCEDURES.
8. **Working with CURSORS**
   Develop Programs using Features Parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of Clause and CURSOR Variables.
9. **Working with Triggers using PL/SQL**
   Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.

TEXT BOOKS:

1. Oracle PL/SQL by Example, Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition.
2. Oracle Database Logic PL/SQL Programming, Scott Urman, Tata Mc-Graw Hill.
3. SQL and PL/SQL for Oracle 10g, Black Book, Dr .P.S. Deshpande.

SCRIPT PROGRAMMING LAB

18ITL43

II B.Tech Semester- II)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Write a script to print some Pythagorean triples.
2. Write a script that demonstrates Regular expression support by the language.
3. Write a script that demonstrates Object Oriented Program support by the language.
4. Write a script to print Fibonacci numbers up to and including the first commandline argument.
5. Write a simple script that displays the mean and median of an array of values, passed in on thecommand line.
6. Write a script to Implement Merge sort
7. Write a script to Implement Quick sort
8. Write a script to implement Depth first search
9. Write a script to implement Breadth first search
10. Write a script to implement Linear Search
11. Write a script to implement Binomial Search

SOFTWARE ENGINEERING

III B.Tech – V Semester (18IT501)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: To introduce the fundamental concepts of software engineering and various software process models.

COB 2: To build an understanding on various phases of software development.

COB 3: Understanding of different software architectural styles.

COB 4: Understanding of software testing approaches such as unit testing and integration testing.

Course Outcomes :

After completing the course students will be having

CO 1: Strong foundation in choosing the best software process models for various projects.

CO 2: Knowledge to apply software engineering practice over the entire system lifecycle.

CO 3: Knowledge to select various architectural styles for various projects based on clients need.

CO 4: Knowledge towards how Software testing approaches such as unit testing and integration testing will be done.

UNIT-I **(15 Periods)**

Software and Software Engineering: The nature of Software, Software Engineering, The Software Process, Software Engineering Practice, Software Myths.

The software Process: Process models, Prescriptive Process Models: The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Concurrent Models.

Specialized Process models:: Component based Development, The Formal Methods Model, Aspect Oriented Software Development. **The Unified Process:**: Phases of the Unified Process.

UNIT - II **(15 Periods)**

Agile Development: What Is Agility? What Is an Agile Process? Agile process models: Adaptive Software Development, Extreme Programming, Scrum, Dynamic Systems Development Method, Crystal, Feature driven Development, Lean Software Development and Agile Modelling.

Understanding Requirements: Requirements Engineering, Establishing the Groundwork, eliciting requirements, Developing Use Cases, Building the requirements Model, Negotiating Requirements, Validating Requirements.

UNIT - III **(15 Periods)**

Requirements Modelling: Scenarios, Information, and Analysis Classes: Requirement Analysis, Scenario-based Modelling, UML Models That Supplement the Use Case, Data Modelling Concepts, Class Based Modelling.

Design Concepts: Design within the Context of Software Engineering, The Design Process, Design Concepts, The Design Model: Data Design Elements, Architectural Design Elements, Interface Design Elements, Component-Level Design Elements.

Architectural Design:: Software Architecture, Architectural Styles, Architectural Patterns.

UNIT - IV **(15 Periods)**

textbf Quality Management: What is Quality?, Achieving Software Quality, Cost Impact of Software Reviews, Defect amplification and removal, Informal and Formal Reviews, Elements of SQA, Software Reliability.

Software Testing Strategies: A Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System Testing, The Art of Debugging.

Testing Conventional Applications: Software testing Fundamentals, Internal and External Views of Testing, White-Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing, Model-Based Testing.

TEXT BOOKS:

1. Roger S. Pressman, Software Engineering - A Practitioner’s Approach, Seventh Edition, McGraw Hill Publications.

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.

AUTOMATA & COMPILER DESIGN

III B.Tech – V Semester (18IT502)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Discrete Mathematics (18IT303)

Course Objectives:

The student will be able to:

COB 1: The concepts of finite automata and regular languages and their properties.

COB 2: The concepts of Context free grammars and push down automata.

COB 3: The phases of a compiler, lexical analysis and parsing techniques.

COB 4: Different intermediate code forms and code generation algorithm for target machine.

Course Outcomes:

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

CO 1: Design finite state machines for acceptance of strings and understand the concepts of regular languages and their properties.

CO 2: Design context free grammars for formal languages and develop pushdown automata for accepting strings.

CO 3: Understand the phases of a compiler and construct lexical analysis, top-down and bottom-up parsers.

CO 4: Apply intermediate, code generation techniques and runtime allocation strategies.

UNIT - I (14 Periods)

Finite Automata: Introduction to Automata, Deterministic finite automata (DFA), Problems on DFA, Non deterministic finite automata (NFA), Equivalence of DFA and NFA, Finite Automata with € transitions, Equivalence and minimization of automata.

Regular Expressions and Languages: Regular expressions, Algebraic laws of regular expressions, Pumping lemma for regular languages, Applications of the pumping lemma, Closure Properties of Regular Languages.

UNIT - II (14 Periods)

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 forms for context- Free grammars, the pumping lemma for context free languages.

UNIT - III (14 Periods)

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

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. Bottom up parsing Shift Reduce parsing, LR Parsers – Construction of SLR, Canonical LR and LALR parsing techniques, Parser generators – YACC Tool.

UNIT - IV (14 Periods)

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

Runtime Environment: Source language issues, Storage organization, Storage-allocation strategies.

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. John E. Hopcroft et al., Introduction to Automata Theory, Languages and Computation, 3rd Ed.,Pearson, 2008.
2. A.V. Aho et al., “Compilers: Priniciples, Techniques, Tools”, 2nd Edition, Pearson, 2006.

REFERENCES:

1. John E Hopcroft & Jeffery D Ullman, “Introduction to Automata Theory & Languages andComputation”, Narosa Publishing House.
2. Alfred V.Aho, Jeffrey D. Ullman, “Principles of Compiler Design”, Narosa publishing.

ENTERPRISE PROGRAMMING

III B.Tech – V Semester (18IT503)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Object Oriented Programing (18IT304), Web Technologies (18IT402)

Course Objectives:

COB 1: Understand the Java EE architecture and Write different Servlets which can access database using JDBC.

COB 2: Create web applications using a combination of client-side (JavaScript, HTML) and server-side technologies (JSP, JSF, SERVLETS, Web Sockets).

COB 3: Write Web applications using EJB.

COB 4: Design and implement Web Services (SOAP and UDDI).

Course Outcomes:

After the course the students are expected to be able to **CO 1:** Write

Web applications using Java Servlets and JDBC.

CO 2: Build web applications using JSP, JSF, Web Sockets.

CO 3: Create web applications using Session Beans, Entity Beans and Message driven Beans.

CO 4: Recognize the use of web servers and know the functionality of web servers and also Create Web Services.

UNIT - I (17 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, Library Application Using JDBC.
Java Servlets and Web Applications: Foundations of the Web Tier : The HTTP Protocol, Introducing Java Servlets, Example Java Servlet Application: Photo Application, Understanding the Java Servlet API, Web Applications, **Java Servlets:** The Good and the Bad.

UNIT - II (17 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, JSP Photo Album.
Assembling Dynamic Web Pages: Java Server Faces - Architecture of a JSF Application, Java Server Faces Tags, Java EE Managed Beans, f: Core Tags, JSTL Core Tags, Extensibility and Modularity, Photo Application.

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, The Chat
Application.

UNIT - III **(18 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 Beans, Banking Example.

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, The Persistent Library Service.

UNIT - IV **(18 Periods)**

SOAP Web Services : Understanding SOAP Web Services, SOAP Web Services Specifications Overview, Writing SOAP Web Services, Invoking SOAP Web Services, Putting It All Together.

TEXT BOOKS:

1. Dr. Danny Coward, “Java EE 7: The Big Picture”, oracle press.
2. Antonio Goncalves “Beginning Java EE 7 ” apress.

REFERENCES: 1. Arun Gupta “Java EE 7 Essentials” O’Reilly.

WIRELESS NETWORKS

III B.Tech – V Semester (18IT504)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: Computer Networks (18IT405)

Course Objectives:

COB 1: Able to understand the mobile communication systems and the characteristics of different multiple access techniques in mobile communication.

COB 2: Learn wireless communication systems-Telecommunication systems GSM,DECT, UMTS, IMT, Sattelite systems and Broadcast syatems

COB 3: Describe and analyze the different wireless LAN technalogies and mobile network layer.

COB 4: The ability to understand the transport layer and wireless applications protocols .

Course Outcomes:

After the course the students are expected to be able to

CO 1: understand the mobile communication systems and the characteristics of different multiple access techniques in mobile communication

CO 2: Understand the wireless communication systems-Telecommunication systems GSM,DECT, UMTS, IMT, Sattelite systems and Broadcast syatems

CO 3: Understand the the different wireless LAN technalogies and mobile network layer.

CO 4: understand the transport layer and wireless applications protocols .

UNIT - I (14 Periods)

Introduction: Applications, A short history of Wireless Communications, A market for Mobile Communications, A simplified reference model.

Wireless Transmission: Frequencies, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread Spectrum.

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

UNIT - II (14 Periods)

Telecommunication Systems: GSM, DECT, TETRA, UMTS and IMT-2000.

Satellite Systems: History, Applications, Basics (GEO, LEO, MEO), Routing, Localization, Handover. **Broadcast Systems:** Over view, Cyclic repetition of data, Digital Audio Broadcasting, Digital Video Broadcasting.

UNIT - III (14 Periods)

Wireless LAN: Infrared Vs. Radio transmission, Infrastructure and ad hoc networks, IEEE 802.11, HIPERLAN, Bluetooth.

Mobile Network Layer: Mobile IP, Dynamic host configuration, Ad hoc networks.

UNIT - IV (14 Periods)

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit / fast recovery, Transmission / time-out freezing, Selective retransmission, Transaction oriented TCP.

Wireless Application Protocol: Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Wireless markup language, WML Script, Wireless telephony application, Example stacks with WAP.

TEXT BOOKS:

1. J.Schiller, “Mobile communications”, Addison-Wesley, 2003

REFERENCES:

1. William Stallings, “Wireless Communication Networks”, Pearson Education.
2. UWE Hansmann, LotherMerk, Martin S.Nicklous, Thomas Stober, “Principles of Mobile Computing”,2nd Edition.

MACHINE LEARNING

III B.Tech – V Semester (18IT505)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: Understand the learning phenomena in living beings.

COB 2: Build a classifier using Regression and Decision Trees.

COB 3: Combine the outcomes of different classifiers for better classification performance.

COB 4: Understand Cluster Analysis.

Course Outcomes:

After the course the students are able to

CO 1: Design an Artificial Neural Network.

CO 2: Do prediction and classification using Regression and Decision Trees respectively.

CO 3: Understand Ensemble Learning.

CO 4: Do Cluster Analysis.

UNIT - I **(15 Periods)**

Machine Learning Basics: Introduction, Types of Machine Learning Systems, Main Challenges of Machine Learning, Prepare the Data for Machine Learning Algorithms, Train a Model and Fine-Tune a Model.

Classification : Training a Binary Classifier, Performance Measures to evaluating a classifier, Multiclass Classification, Error Analysis, Multilabel Classification.

Training Models: Linear Regression, Gradient Descent, Polynomial Regression, Learning Curves, Regularized Linear Models and Logistic Regression.

UNIT - II **(15 Periods)**

Support Vector Machines: Linear SVM Classification, Nonlinear SVM Classification, SVM Regression. **Decision Trees:** Training and Visualizing a Decision Tree, Making Predictions, Estimating Class Probabilities, The CART Training Algorithm, Gini Impurity or Entropy?, Regularization Hyperparameters

UNIT - III **(15 Periods)**

Ensemble Learning: Voting Classifiers, Bagging and Pasting, Out-of-Bag Evaluation, Random Patches and Random Subspaces, Random Forests, Boosting and Stacking.

Unsupervised Learning Techniques: Partition methods for Clustering: K-Means algorithm.

UNIT - IV **(15 Periods)**

Introduction to Artificial Neural Networks: Biological Neurons, Logical Computations with Neurons, The Perceptron, The Multilayer Perceptron and Backpropagation and Fine-Tuning Neural Network Hyperparameters.

TEXT BOOKS:

1. Python Machine Learning Second Edition, Sebastian Raschka & Vahid Mirjalili, 2017, Packt Publishing.
2. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow by Aurélien Géron, SecondEdition, O'Reilly publishers, 2019
3. Machine Learning by Tom M. Mitchell, First Edition, McGraw Hill Education.

REFERENCES:

1. Neural Networks and Deep Learning by Michael Nielsen (Free online text book available at URL:http://neuralnetworksanddeeplearning.com/)
2. Deep Learning, Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press, 2016 (Free onlinetext book available at URL:- http://www.deeplearningbook.org)
3. Data Mining Concepts and Techniques Third Edition, Jiawei Han and Micheline Kamber, MorganKaufmann Publishers.

ALGORITHMIC GRAPH THEORY

III B.Tech – V Semester (18ITD11)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: Design & Analysis of Algorithms (18IT406)

Course Objectives: Students will be able to

COB 1: Understand and apply the fundamental concepts in Graph Theory.

COB 2: Understand the cordinality matching concepts in graph theory.

COB 3: Describe algorithm based tree-decompositions.

COB 4: Understand advanced graph theory topics such as ramsey theorem,extremal grahs.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Apply principles and concepts of graph theory in practical situations.

CO 2: Prove some fundamental statements on graphs.

CO 3: Apply the knowledge of various graph algorithms in practical situations.

CO 4: Solve abstract-level algorithms of presented problems.

UNIT - I (14 Periods)

Introduction to Graphs: Basic Definitions, Properties, Preliminaries on graphs

Connectivity : vertex and edge connectivity, cuts, blocks, k-connected graphs, Applications-Construction of Reliable Communication Networks.

UNIT - II (14 Periods)

Matchings: Cardinality matching in bipartite graphs, Weighted matching in bipartite graphs, Edmonds matching algorithm for general graphs, Algorithms for vertex cover in bipartite graphs.

UNIT - III (13 Periods)

Networks: Flows, Cuts, The Max-flow Min-cut theorem-applications, Menger's Theorems.
Vertex colourings: chromatic number, Brook's theorem.

UNIT - IV (13 Periods)

Advanced Topics: Perfect graphs, matroids, Ramsay theory, extremal graphs, random graphs.

TEXT BOOKS:

1. D. West, Introduction to Graph Theory, Second Edition, PHI, 2003.
2. J. A. Bondy and U. S. R. Murty, Graph Theory with Applications, North Holland, 1976.
3. Martin Charles Golumbic, Algorithmic Graph Theory and Perfect Graphs, Academic Press, 1980.

REFERENCES:

1. M. A. Iqbal, Graph Theory & Algorithms, Electronic edition 2010.
2. Chartrand & Oellermann, Applied and Algorithmic Graph Theory,McGraw Hill,1993.
3. William Kocay and Donald L. Kreher, Graphs, Algorithms, and Optimization, CRC Press, 2005.

NO SQL DATABASES

III B.Tech – V Semester (18ITD12)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Data Base Management Systems (18IT403)

Course Objectives:

Students will be able to

COB 1: Determine the importance of NoSQL Databases and Understand four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).

COB 2: Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.

COB 3: Familiar with MongoDB, installation of mongoDB, CRUD operations, Aggregation framework.

COB 4: Understand the concepts of performance tuning in MongoDB and database sharding.

Course Outcomes :

After the course the students are able to

CO 1: Familiarize with fundamental concepts of NoSQLdatabase and Compare various database architectures.

CO 2: Define, compare and use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).

CO 3: Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.

CO 4: Evaluate NoSQL database development tools and programming languages.

UNIT - I (14 Periods)

Introduction: Introduction to DBMS, Difference between RDBMS and NoSQLDatabase, Definition of NOSQL, History of NOSQL, NoSQL Storage Architecture, Types of NoSQl databases- Document Databases, Key-value databases , Column Oriented databases, Graph databases , When to use NoSQL and when not, Interfacing and Interacting with NOSQL.

UNIT - II **(15 Periods)**

Document databases using MongoDB: Document Databases, What Is a Document Database?
Features, Consistency, Transactions, Availability, Query Features, Scaling, Suitable Use Cases, Event Logging, Content Management Systems, Blogging Platforms, Web Analytics or Real-Time Analytics, E-Commerce Applications, When Not to Use, Complex Transactions Spanning Different Operations, Queries against Varying, Aggregate Structure.

UNIT - III **(15 Periods)**

MongoDb Introduction: MongoDB Installation, CRUD operations with MongoDB-Create and Drop Databases, Create and Drop Collections, Insert Document, Query Document, AND-OR Conditions, Update Document, Delete Document, Modifying andManaging NOSQL Data stores, Backup and Restore.

UNIT - IV **(16 Periods)**

MongoDBIndexing: Performance Tuning in MongoDB, Aggregation framework, Sharding in MongoDB , Python and MongoDB, Creating Blog Application with PHP and MongoDB.

TEXT BOOKS:

1. MongoDB:The Definitive Guide by Shannon Bradshaw, Eoin Brazil, Kristina Chodorow, 3rd Edition,Oreilly,2019
2. NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence by Pramod J. Sadalageand Martin Fowler, 1st Edition, Pearson Education, 2012.
3. MongoDb in Action by Kyle Banker, Peter Bakkum, Shaun Verch, Doug Garrett, Tim Hawkins, 2ndEdition, Manning publications,2016.

REFERENCES:

1. MongoDBCookBook by Cyrus Dasadia & AmolNayak, 2nd Edition,PACKT Publishing, 2014.
2. NoSQL for Mere Mortals,Dan Sullivan,1stEdition, Addison-Wesley Professional,Pearson Education,2015.

ADVANCED WEB TECHNOLOGIES

III B.Tech – V Semester (18ITD13)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: Web Technologies (18IT402)

Course Objectives:

Students will be able to

COB 1: Understand the design of single-page applications and how AngularJS facilitates their development.

COB 2: Understand Component Architecture of Angular

COB 3: Develop Single Page Applications using Angular

Course Outcomes:

After the course the students are expected to be able to

CO 1: Write scripts using Type Script.

CO 2: Identify the usage of Components and Modules.

CO 3: Develop a single page web application.

CO 4: use web services in a web application.

CO 5: Design forms in a single page web application.

UNIT - I **(14 Periods)**

Angular a Modern web platform: Why choose Angular, The journey from Angular JS to Angular. Angular CLI, Server Rendering and Compiler, UI libraries, Component Architecture, Type Script, Observables, Building your first Angular App

UNIT - II **(14 Periods)**

App Essentials: Modules, Components, Directives, Pipes, Services. Dependency Injection.

Component Basics: Life cycle of Components, Advanced Components: Styling Components and Encapsulation Modes, Dynamically rendering Components.

UNIT - III **(14 Periods)**

Services: Creating Angular Service, Using HttpClient Service.

Routing: Routing Parameters, Secondary Routes

UNIT - IV **(14 Periods)**

Building Custom Directives and Pipes: Crafting Custom Directives, Crafting Custom Pipes. **Forms:** Template Driven Forms, Reactive Forms.

TEXT BOOKS:

1. Angular in Action, Jeremy Wilkin, Manning Publications.

REFERENCES:

1. Ng-Book: The Complete Guide to Angular, Nathan Murray, Felipe Coury, Ari Lerner, Carlos Taborda, 8ed

INTRODUCTION TO COMPUTER ANIMATION

III B.Tech – V Semester (18ITD14)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Object Oriented Programming (18IT304).

Course Objectives:

Students will be able to

COB 1: Understand work with the Maya workspace while animating a scene.

COB 2: Describe basic user interface actions, scene hierarchies and build character.

COB 3: Create model, texture and animate a complete character.

COB 4: Illustrate different kinds of texture maps to the stage, prepare the file for rendering and MEL script.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Apply proper technique while creating animations.

CO 2: Explain user interface actions, scene hierarchies and building character.

CO 3: Explain building a model, texture and animate a complete character and use MEL script.

CO 4: Explain animate a complete character and use MEL script.

UNIT - I **(14 Periods)**

Bouncing a Ball: Building Objects, Animating the Ball.
Adding Character: Refining the animated channels,Cleaning up curves, Squash and Stretch.
Rendering: Hiding the general UI, Hotkeys, Shading Groups.

Particles and Dynamics: Project set-up, Add an emitter to the ball, Add gravity to the particles, Set particle attributes, Create the look of the particles, Create a particle collision, Create a particle event, Hardware rendering, Compositing particles, Resetting the user interface.

UNIT - II (14 Periods)

Working with Maya: Basic User Interface Actions, Selecting in Maya, Tools and actions.

Dependency graph: Hierarchies and dependencies, Shading group nodes, Making your own connections, Adding a texture node, Animating the sphere, Building scene hierarchies, Hiding objects, Procedural animation, Creating a curve on surface, Create group hierarchy, Create a path animation, Layer the animation.

Building Salty: File management, Building Salty's body, Editing CVs, Positioning the CVs, Finishing touches, Building skeleton joints, Bind the surface to the joints, Templating objects, Building the front flipper, The side shape, Refining the flipper, The back flipper, Mirroring the flippers, Add joints for the flippers, Joining the flippers to the body, Binding the surfaces, Salty's shading group.

UNIT - III (14 Periods)

Adding Facial details: Initial set-up, Building Salty's right eyeball, Creating a target for the eyeball, Creating the eyelid, The Hypergraph,Deforming the eye, Adding a cluster deformer, Positioning the eye, Creating the second eye, Building the eye control node, Adding a blink attribute, Adding a pupil attribute, Building the whiskers, Texturing the whiskers, Building Salty's nose, Parenting to the skeleton. **Animating Salty:** Initial set-up, Adding IK single chain handles,Add an IK spline handle, Cluster the spline curve, Create a ball, Connect the ball to Salty's nose, Setting up for the animation, Animating Salty,Dynamics.

Building The Set: Initial set-up, Creating the pool, Creating the back wall, Lighting the set.

UNIT - IV (14 Periods)

Texture Mapping: Initial set-up, Creating the deck shading, Adding a bump map, Refining the floor materiality, The water shading group, Layered shaders, Refining the lighting, Rendering.

Blinking Using MEL: MEL, Typing commands, The Command line, The Script Editor window, Learning more about commands, Expressions, Building a blink procedure, Writing the script, Adding the function to the UI, Building a custom UI script, Keyframing Salty's blink, The Scripts.

TEXT BOOKS:

1. Learning Maya,Don Chong, Bruce Darrell, Bob Gundu, Robert Magee, Alias|Wavefront- a division of Silicon Graphics Limited.

REFERENCES:

1. Maya- Professional Tips and Techniques, Lee Lanier, Wiley Publishing 2008.
2. Understanding 3D Animation using Maya, John Edgar Park, Springer.
3. An Essential Introduction to Maya Character Rigging, Cheryl Cabrera, Focal Press, first edition 2008.

ENTERPRISE PROGRAMMING LAB

III B.Tech – V Semester (18ITL51)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Write a program to demonstrate Generic & HTTP Servlets.
2. Write a program to demonstrate cookie & Sessions.
3. Write an application to integrate JSP & Servlets.
4. Write a program to demonstrate Session Bean.
5. Write a program to demonstrate Entity Bean.
6. Write a program to demonstrate Java Mail
7. Write a program to demonstrate Remote Method Invocation.
8. Write a program to demonstrate Java Message service.
9. Write a program to demonstrate JNDI.
10. Develop an e-business application using XML.
11. Develop an application for Client Request I Responses using SOAP.
12. Demonstrate how to describe web services using WSDL.

MACHINE LEARNING LAB

III B.Tech – V Semester (18ITL52)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Apply Naive Bayes Classifier on a given dataset and evaluate the performance of classifier model.
2. Apply Simple Linear Regression on a given dataset and evaluate the performance of prediction modelobtained.
3. Apply Multiple Linear Regression on a given dataset and evaluate the performance of prediction modelobtained.
4. Apply Logistic Regression on a given dataset and evaluate the performance of prediction modelobtained.
5. Apply Support Vector Machine classifier (SVM) on a given dataset and evaluate the performance ofclassifier model obtained.
6. Apply Decision Tree classifier (ID3) on a given dataset and evaluate the performance of classifiermodel obtained.
7. Build an Artificial Neural Network by implementing the Backpropagation algorithm to classify a givendataset and evaluate the performance of classifier model obtained.
8. Apply Random forest algorithm on a given dataset and compare the classification accuracy with thatof Decision Tree classifier (ID3).
9. Apply k-nearest neighbor classifier on a given dataset and evaluate the performance of classifier modelobtained.
10. Apply K-means clustering algorithm on a given dataset and evaluate the clusters obtained
11. Apply Hierarchical clustering algorithm using different linkages on a given dataset and evaluate theclusters obtained.
12. Apply DBSCAN clustering algorithm on a given dataset and evaluate the clusters obtained.

ALGORITHMIC GRAPH THEORY LAB

III B.Tech – V Semester (18ITDL11)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Program to implement Simple Path Graph.
2. Program to construct Graph with Simple cycles.
3. Program for computing average degree of nodes in a graph.
4. Program to find nodes of ODD/Even degree.
5. Program to find minimum distance pairs.
6. Program to create Complete graph.
7. Program to compute minimum wieght matching in a graph.
8. Program to implement augment ond original graph.
9. Program to compute eulerian circuit.
10. Program to compute eigen values.

TEXT BOOKS:

1. Galil, Z. (1986). ”Efficient algorithms for finding maximum matching in graphs”. ACM ComputingSurveys. Vol. 18, No. 1: 23-38.
2. Edmonds, Jack (1965). ”Paths, trees, and flowers”. Canad. J. Math. 17: 449–467.
3. https://networkx.github.io/documentation/stable/index.html.

NO SQL DATABASES LAB

III B.Tech – V Semester (18ITDL12)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Installing MongoDb on the local computer.
2. Using MongoDB as a service(Cloud MongoDB).
3. Installing GUI tools for MongoDB management.
4. Exploring MongoDB Server and shell versions.
5. Create, Read, Update and Delete operations
   Exploring Databases and collections, Create and Delete databases and collections, insert(), insertone(), insertmany(), insert document with different value types, generating sample set of documents, foreach(), toarray(), count(), limit(), skip(), sort() and findone().
6. Working with MongoDb Queries
   Insert sample documents,Empty query, Equality query, Comparison Operators - $eq, $neq, $lt, $gt, $in, $nin, $and
   Array operators $all, $size, $elemMatch, $exists and $type, Fields Filtering, $regex.
7. Working with Updating Documents
   Create Sample Documents, $set, $unset, update one Document, update multiple Documents, updateOne(), updateMany(), replaceOne(), $rename, $currentDate, $push, $addToSet, $pop, $pull, $pullAll, $inc.
8. Working with Delete Operations
   Create temp DB, Collection and Documents, remove(), deleteOne(), deleteMany(), drop() Collection, dropDatabase().
9. Working with Aggregation Frameworkaggregate(), $match, $group, $group by nested fields, $group by multiple fields, $swap, $match, $group, $project, $sum, $avg and $count.
10. Working with Indexes
    Create Unique index, Create index in background.
11. Working with MongoDB Utilities
    MongoDB export, MongoDb Import, MongoDB Dump, MongoDB restore.

TEXT BOOKS:

1. MongoDB- The Definitive Guide ,2nd Edition, Oreilly
2. MongoDb in Action by Kyle Banker, Peter Bakkum, Shaun Verch, Doug Garrett, Tim Hawkins, 2ndEdition, Manning publications.

ADVANCED WEB TECHNOLOGIES LAB

III B.Tech – V Semester (18ITDL13)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Create a single page web application to display a profile of the student.
2. Create a basic web application with different input elements for user registration.
3. Create a web application for authenticating user credentials.
4. Create a web application with multiple components
5. Demonstrate a web application that creates a web service.
6. Demonstrate a web application that uses Directives.
7. Demonstrate a web application that uses Pipes.
8. Create a web application with Reactive forms.

COMPUTER ANIMATION LAB

III B.Tech – V Semester (18ITDL14)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. create scene models with MAYA :link to download the sample - https://sites.google.com/view/becitcalab–18itdl14/home
2. Texture and lighting the models with MAYA : Sample render result for help to make own theme basedrender and scene generation. link to download the sample models for Texture and lighting :
   https://sites.google.com/view/becit-calab–18itdl14/home
   https://mega.nz/#F!gA0FyK5Z!gEgfKoHStX085vanQM9sPw
3. Character rigging : link to download the sample models https://sites.google.com/view/becit-calab–18itdl14/home
4. Maya application to create Human Walk Cycle: link to download the sample https://sites.google.com/view/becit-calab–18itdl14/home
5. Maya application to create Human run Cycle: link to download the sample https://sites.google.com/view/becit-calab–18itdl14/home
6. Maya application to create cat Walk Cycle and run cycle : link to download the sample https://sites.google.com/view/becit-calab–18itdl14/home
7. Maya application to make a ball moving in a helical path
8. Maya application to show animation of solar system
9. Maya application to show a Growing Tree
10. Maya application to show Explosion with Maya Fluids
11. Maya application to make the rocket fly
12. Maya application to show steam train engine

TEXT BOOKS:

1. Learning Maya,Don Chong, Bruce Darrell, Bob Gundu, Robert Magee, Alias|Wavefront- a division of Silicon Graphics Limited.

REFERENCES:

1. Maya- Professional Tips and Techniques, Lee Lanier, Wiley Publishing 2008.
2. Understanding 3D Animation using Maya, John Edgar Park, Springer.
3. An Essential Introduction to Maya Character Rigging, Cheryl Cabrera, Focal Press, first edition 2008.

HUMAN COMPUTER INTERACTION

III B.Tech – VI Semester (18IT601)

Lectures	:	4 Periods / Week	Tutorial	:		Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: Determine the characteristics of good user interface designs.

COB 2: Recognize how a computer system may be modified to include human diversity.

COB 3: Investigate the automatic generation of user interfaces from high-level specifications.

COB 4: Evaluate user interfaces and applications using a variety of methods.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Identify the importance of HCI.

CO 2: Understand various HCI design tools.

CO 3: Analyse automatic generation of user interfaces

CO 4: Analyse the relevance of user interface for a given application.

UNIT - I (14 Periods)

Introduction to HCI: Human computer interface: Characteristics of graphics interface, direct manipulation graphical system, web user interface, popularity, characteristic and principles.

UNIT - II (14 Periods)

Interface Design Process: User interface design process: Obstacles, usability, human characteristics in design, human interaction speed, business functions; Requirement analysis, direct ,indirect methods, basic business functions, design standards, system timings; Human consideration in screen design.Structures of menus, functions of menus, contents of menu, formatting, phrasing the menu, selecting menu choice, navigating menus, graphical menus.

UNIT - III (14 Periods)

Windows: Characteristics: Components, presentation styles, types, managements, organizations, operations.
Web systems: Device based controls characteristics, screen based controls, operate control, text boxes, selection control, combination control, custom control, presentation control.

UNIT - IV (14 Periods)

Multimedia: Text for web pages: Effective feedback, guidance and assistance, internationalization, accessibility, icons, image, multimedia, coloring.
Windows Layout Test Prototypes: Kinds of tests, retest, information search, Visualization, hypermedia

TEXT BOOKS:

1. Wilbent. O. Galitz, The Essential Guide To User Interface Design, John Wiley and Sons, 3rd Edition,2007.
2. Ben Sheiderman, Design The User Interface, Pearson Education, 6th Edition, 2016.

REFERENCES:

1. Alan Cooper, The Essential of User Interface Design, Wiley – Dream Tech Ltd., 2nd Edition, 2002.

ARTIFICIAL INTELLIGENCE

III B.Tech – VI Semester (18IT602)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Design and Analysis of Algorithms(18IT406)

Course Objectives:

Students will be able to

CO1: Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.

CO2: Formalize a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem, as a Markov decision process, etc).

CO3: Implement basic AI algorithms (e.g., standard search algorithms or dynamic programming). **CO4:**

Implement basic AI algorithms (e.g., standard search algorithms or dynamic programming).

Course Outcomes:

After the course the students are expected to be able to

CLO1: Understand the basics of AI and knows about Intelligent agents, how to use Searching for Solving problems

CLO2: Understand about Logical Agents, First order Logic, Classical Planning.

CLO3: Understand Probabilistic reasoning and know how to perform reasoning and planning.

CLO4: Understand the concepts of Learning.

UNIT - I **(14 Periods)**

Introduction to AI: What is AI? , Foundations of AI, History of AI, State of the Art. Intelligent Agents: Agents and Environments, Good Behavior: Concept of Rationality, The Nature of Environments And The Structure of Agents.
Solving Problems by Searching: Problem Solving Agents, Searching for Solutions, Uninformed Search Strategies: Breadth First Search, Uniform Cost Search, Depth First Search, Iterative Deepening DFS and Bi-directional Search.
Informed (Heuristics) Search Strategies: Greedy BFS, A* Algorithm, Heuristics Functions.
Beyond Classical Search: Local Search Algorithms and Optimization Problems-Hill Climbing, Simulated Annealing, Genetic Algorithm, Searching with Non Deterministic Actions: AND-OR Graphs, Online Search Agents and Unknown Environments.

Adversarial Search: Games, Optimal Decisions in Games, Alpha Beta Pruning and Imperfect Real Time Decisions.
Constraint Satisfaction Problems: Defining Constraint Satisfaction Problems, Local Search in CSPs, Structure of Problems.

UNIT - II **(14 Periods)**

Logical Agents: Knowledge Based Agents, The Wumpus World, Logic and Propositional Logic: Propositional Theorem Proving: Inference and proofs, Proof by resolution, Horn clauses and definite clauses, Forward and Backward chaining, Effective Propositional Model Checking, Agents Based on Propositional Logic.
First Order Logic: Representation Revisited Syntax and Semantics of First Order Logic, Using First Order Logic, Knowledge Engineering in First Order Logic.
Inferences in First Order Logic: Propositional vs. First Order Inference, Unification and Lifting, Forward Chaining, Backward Chaining, Resolution.
Knowledge Representation: Ontological Engineering, Categories and Objects, Events, Mental Events and Mental Objects, Reasoning Systems for Categories, Reasoning with Default Information.

UNIT - III **(14 Periods)**

Classical Planning: Definition of Classical Planning, Algorithms for Planning as State-Space Search, Planning Graphs, Other Classical Planning Approaches, Analysis of Planning Approaches.
Planning and Acting in the Real World: Time, Schedules, and Resources, Hierarchical Planning, Planning and Acting in Nondeterministic Domains, Multi agent Planning.

UNIT - IV **(14 Periods)**

Uncertain Knowledge & Reasoning:
Uncertainty: Acting under Uncertainty, Basic Probability Notation, Inference Using Full Joint Distributions, Independence, Bayes' Rule and Its Use.
Probabilistic Reasoning: Representing Knowledge in an uncertain Domain, The Semantics of Bayesian Networks, Exact Inference in Bayesian Networks, Approximate Inference in Bayesian Network, Other Approaches to Uncertain Reasoning.

TEXT BOOKS:

1. Stuart Russel and Peter Norvig, Artificial Intelligence – A Modern Approach, 3rd Edition, Pearson Education/ PHI.

REFERENCES:

1. Elaine Rich & Kevin Knight, Artificial Intelligence, 3rd Edition, (TMH).
2. Patrick Henry Winston, Artificial Intelligence, Pearson Education

INTRODUCTION TO CYBER SECURITY

III B.Tech – VI Semester (18IT603)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Discrete Mathematics(18IT303),Computer Networks(18IT405).

Course Objectives:

COB 1: To make the students familiar with Security services and Security mechanisms and Hacking phases.

COB 2: To make the students familiar with Cryptographic algorithms.

COB 3: To make the students familiar with Data Integrity.

COB 4: To enable students to understand establishment of mutual trust between communicating entities.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explain terms related to Security services, Security mechanisms and Hacking.

CO 2: Explain principles of operation of Symmetric and Asymmetric Encryption techniques.

CO 3: Describe Integrity algorithms.

CO 4: Describe Authentication algorithms.

UNIT - I (17 Periods)

Int to Computer Security: Definition of Computer Security, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms and A Model for Network Security.

Hacking: Basic Terminology, Hacker's Motives and Objectives, Hacker Classes, Hacking Phases and Role of an Ethical Hacker.

Reconnaissance:

Footprinting: Footprinting through Search Engines, Footprinting through Google Hacking Techniques, Footprinting through Social Networking Sites, Website Footprinting, WHOIS Footprinting, DNS Footprinting and Footprinting through Social Engineering.

Network Scanning: Objectives of Network Scanning, TCP/IP protocol stack, Types of Network Scanning and Nmap tool for Network Scanning.

Enumeration: What is Enumeration?, NetBIOS Enumeration, SNMP Enumeration, LDAP Enumeration, NTP Enumeration, SMTP Enumeration and DNS Zone Transfer Enumeration.

UNIT - II **(17 Periods)**

Symmetric Ciphers: Classical Encryption Techniques, Block Ciphers and the DES, AES and Block Cipher Operation

Public Key Cryptography: Principles of Public-Key Cryptosystems, The RSA algorithm and Diffie Hellman Key Exchange Algoritham

UNIT - III **(18 Periods)**

Cryptographic Data Integrity Algorithms:

Cryptographic Hash Functions: Applications of Cryptographic Hash Functions, Security Requirements for Cryptographic Hash Functions, Hash Functions Based on Cipher Block Chaining and Secure Hash Algorithm (SHA-512).

Message Authentication Codes: Message Authentication Requirements, Message Authentication Functions, Requirements for Message Authentication Codes, Security of MACs and MACs Based on Hash Functions (HMAC).

Digital Signatures: Properties, Attacks and Forgeries, Digital Signature Requirements, Direct Digital Signature and Elgamal Digital Signature Scheme.

UNIT - IV **(18 Periods)**

Algorithms to establish Mutual Trust:

Key Management and Distribution : Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key Distribution Using Asymmetric Encryption, Distribution of Public Keys, X.509 Certificates and Public-Key Infrastructure.

User Authentication: Remote User-Authentication Principles, Remote User-Authentication Using Symmetric Encryption, Kerberos and Remote User Authentication Using Asymmetric Encryption

TEXT BOOKS:

1. Cryptography and Network Security - Principles & Practice by William Stallings, 7*th*ed, Prentice Hall.

REFERENCES:

1. Cryptography and Network Security by Behrouz A. Forouzan and Debdeep Mukhopadhyay 2*nd*ed, Mcgraw-Hill Education, 2010.

CLOUD COMPUTING

III B.Tech – VI Semester (18IT604)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Operating System(18IT305), Object Oriented Programming(18IT304), Computer Networks (18IT405)

Course Objectives:

The students will be able to

COB 1: Know Cloud Computing Concepts, Technologies and Architecture.

COB 2: Learn developing cloud applications using AWS.

COB 3: Familiarize with various Amazon Storage, Container, Messaging and Data Services.

COB 4: Know the concepts of AWS Management, Big Data Analytics, Machine Learning and Cloud Security.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand Cloud Computing Concepts, Models and Technologies.

CO 2: Develop Cloud applications using AWS Compute Services.

CO 3: Use AWS Storage, Container, Messaging, Kinesis and Data Services.

CO 4: Use AWS Management tools, Big Data Analytics, Machine Learning and Security Tools.

UNIT - I (14 Periods)

Introduction to Cloud Computing: Definition, Characteristics, 5-4-3 principles of Cloud Computing, Cloud Eco System, features of Cloud service, benefits and drawbacks, Cloud architecture, Anatomy of Cloud.

Cloud Deployment and Service Models: Deployment Models, Service Models.

Technological Drivers for Cloud Computing: SOA and Cloud, Virtualization – Types of Virtualization, Approaches to Virtualization, Hypervisor; Multicore technology, Memory and Storage technologies, Networking Technologies, Programming Models, Cloud-OS, Application development environment.

UNIT - II **(14 Periods)**

Developing Applications: Cloud application features, Programming Models, Cloud Service Providers, Platforms, Web APIs, Standards, Open Source support for Cloud. Developing Cloud applications using Java.

AWS Cloud: Amazon Web Services Cloud, Developer Tools.

Working with AWS Compute Services: EC2 – features, instance types, managing EC2 using Management Console, AWS CLI, AWS SDK and CloudWatch; AWS Lambda.

UNIT - III **(14 Periods)**

AWS Services: S3, Amazon EBS, Amazon EFS, Container Services – Amazon ECR, Amazon ECS; AWS Messaging Services – Amazon SQS & Amazon SNS; Kinesis, Amazon CloudSearch.

Working with Data: using AWS RDS, using NoSQL Databases - Amazon SimpleDB and Amazon DynamoDB; Data Transfer Service.

UNIT - IV **(14 Periods)**

AWS Management: Tools for managing AWS Cloud - AWS Auto Scaling, AWS CloudFormation, AWS CLI, AWS Compute Optimizer, AWS Config, AWS Managed Services and AWS Trusted Advisor.

Big Data Analytics & Machine Learning: Amazon Elastic Map Reduce(EMR), Amazon Ethena, Amazon Redshift, Amazon SageMaker.

Security in Cloud Computing: Security aspects – Data Security, Virtualization Security, Network Security, Platform related Security, Audit and Compliance, AWS Identity and Access Management (IAM).

TEXT BOOKS:

1. Essentials of Cloud Computing – K. ChandraSekaran, CRP Press, 2015.
2. Practical Amazon EC2, SQS, Kinesis, and S3: A Hands-On Approach to AWS - Sunil Gulabani,APress, 2017.

REFERENCES:

1. Cloud Computing: A Practical Approach, Anthony T. Velte, Toby J. Velte & Robert Elsenpeter,McGraw-Hill Publ.
2. CLOUD COMPUTING Principles and Paradigms, Rajkumar Buyya, James Broberg & AndrzejGoscinski, John Wiley & Sons Publ.
3. AWS Certified Developer – Associate Guide, Vipul Tankariya & Bhavin Parmar, Packt PublishingLtd. 2017.
4. https://docs.aws.amazon.com/

SOFTWARE TESTING METHODOLOGIES

III B.Tech – VI Semester (18ITD21)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	2
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Software Engineering (18IT501).

Course Objectives:

COB 1: Describe the fundamental elements of Testing.

COB 2: Design models to represent simple application scenarios.

COB 3: Familiar with basic types of Testing.

COB 4: Convert model to application scenarios.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand SDLC Models ,Testing & Types of Testing in detailed.

CO 2: Understand the levels of Testing which are integrated to work on Software Assurance.

CO 3: Understand the concepts of issues related on testing and Organization Structures for Testing Teams.

CO 4: Understand the concepts of Test Planning, Management, Execution and Reporting.

UNIT - I (14 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 - II (14 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 - III (14 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 - IV (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, 2017.

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”, RenuRajani, Pradeep Oak, TMK.
5. “Effective methods of Software Testing”, Perry, John Wiley.

NATURAL LANGUAGE PROCESSING

III B.Tech – VI Semester (18ITD22)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	2
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: NIL

Course Objectives:

COB 1: Understand the methods to identify parts of speech of a word in text.

COB 2: extract information from text.

COB 3: analyze grammar of sentences in a text.

COB 4: find semantics of a given text.

Course Outcomes:

After the course the students are expected to be able to

CO 1: do POS tagging in a text

CO 2: identify named entities and relationships among them in a text

CO 3: validate the syntax of sentences in a text as per the grammar of the language.

CO 4: assign semantics to sentences and summarize text.

UNIT - I **(14 Periods)**

Part-Of-Speech (POS) tagging: Using a Tagger, Mapping Words to Properties Using Python Dictionaries, Automatic Tagging, N-Gram Tagging, Transformation-Based Tagging and How to Determine the Category of a Word

UNIT - II **(14 Periods)**

Extracting Information from Text: Information Extraction, Chunking, Developing and Evaluating Chunkers, Recursion in Linguistic Structure, Named Entity Recognition, Relation Extraction

UNIT - III **(14 Periods)**

Analyzing Sentence Structure: Some Grammatical Dilemmas, What's the Use of Syntax?, Context-Free Grammar, Parsing with Context-Free Grammar, Dependencies and Dependency Grammar, Grammar Development

Building Feature-Based Grammars: Grammatical Features, Processing Feature Structures, Extending a Feature-Based Grammar

UNIT - IV **(14 Periods)**

Analyzing the Meaning of Sentences: Natural Language Understanding, Propositional Logic, First-Order Logic, The Semantics of English Sentences and Discourse Semantics

TEXT BOOKS:

1. Natural Language Processing with Python – Analyzing Text with the Natural Language Toolkit bySteven Bird, Ewan Klein, and Edward Loper, first edition, O'Reilly Media 2009 (Free online text book available at URL:- http://www.nltk.org/book/)
2. Speech and Language Processing by Daniel Jurafsky, James H. Martin 2019 (Free online text bookavailable at URL:- https://web.stanford.edu/ jurafsky/slp3/ed3book.pdf)

REFERENCES:

1. Natural Language Understanding by Allen James, Second Edition, Pearson publishers, 2002.
2. Foundations of Statistical Natural Language Processing – Christopher Manning, Hinrich Schutze, MITPress 2000.
3. Natural Language Processing in Action: Understanding, analyzing, and generating text with Pythonby Hobson Lane, Cole Howard, and Hannes Max Hapke, Manning Publishers 2019.

BIG DATA ANALYTICS

III B.Tech – VI Semester (18ITD23)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	2
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: NIL

Course Objectives:

COB 1: Understand Big Data and Hadoop ecosystem

COB 2: Learn about Hadoop Distributed File System (HDFS)

COB 3: Learn about developing map reduce applications in pig latin and hiveQl.

COB 4: learn about developing applications in Scala and import & export of data between hdfs, sql database.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand Big Data and Hadoop ecosystem

CO 2: create hdfs directory, export data into it and apply hdfs commands.

CO 3: create map reduce applications in pig latin and hiveql.

CO 4: Create map reduce applications in scala, import & export data between sql database, hadfs.

UNIT - I (17 Periods)

Big Data: Introduction to Big Data, Characteristics of Big Data, Sources of Big Data, Applications of Big Data analytics.

Hadoop Installation and Configuration (*Refer Ch:1, Appendix A & Ch:10*) Cluster

Specification- Cluster Sizing, Network Topology, Cluster Setup and Installation-Installing Java, Creating Unix User Accounts, Installing Hadoop, Configuring SSH, Configuring Hadoop, Formatting the HDFS File system, Starting and Stopping the Daemons, Creating User Directories, Hadoop ConfigurationConfiguration Management, Environment Settings, Important Hadoop Daemon Properties.

Hadoop Distributed File System (*Refer Ch:3*) The design of HDFS, HDFS concepts, The command line interface, Hadoop Filesystems, Data Flow.

UNIT - II **(17 Periods)**

YARN (*Refer Ch:4*) Anatomy of a YARN Application Run, YARN Compared to MapReduce 1 and Scheduling in YARN

MapReduce framework (*Refer Ch:2, Ch:7 and Ch:9*) Introduction to Map and Reduce functions, Java MapReduce, Anatomy of a MapReduce Job Run, Failures, Shuffle and Sort, Speculative Execution of a Task, Counters, Writing MapReduce programs and deploy MapReduce programs on Hadoop Cluster.

UNIT - III **(18 Periods)**

Apache Pig (*Refer Ch:16*) 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, A
Load UDF, Data Processing Operators- Loading and Storing Data, Filtering Data, Grouping and Joining Data, Sorting Data, Combining and Splitting Data Pig in Practice-Parallelism, Anonymous Relations, Parameter Substitution.

Apache Hive (*Refer Ch:17*) 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, User defines functions.

UNIT - IV **(18 Periods)**

Apache Spark (*Refer Ch:19*) Installing spark, an example spark application, jobs, stages, tasks, a scala stand alone application, anatomy of spark job run, job submission, DAG construction, task scheduling, task execution, execution cluster managers, spark on YARN.

Sqoop (*Refer Ch:15*) 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, Incremental Imports, Direct-Mode Imports, Working with Imported Data, Imported Data and Hive, Importing Large Objects.

TEXT BOOKS:

1. ”HADOOP The Definitive Guide”, Tom White, O’Reilly Publications, 4th Edition

REFERENCES:

1. Mastering Hadoop 3, Chanchal Singh, Manish Kumar, Packt Publishing, 2019
2. Hadoop MapReduce v2 Cookbook Best Hadoop Books, Thilina Gunarathne, Packt Publishing, 2015.
3. Hadoop Practice Guide : SQOOP, PIG, HIVE, HBASE for Beginners, Jisha Mariam Jose, Notionpress, 2019.

ADVANCED COMPUTER ANIMATION

III B.Tech – VI Semester (18ITD24)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	2
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Computer Animation-1 (18ITD14).

Course Objectives:

Students will be able to

COB 1: Understand model with both NURBS and polygonal geometry.

COB 2: Describe build and edit animation along path.

COB 3: Create model, texture and animate a walking character.

COB 4: Illustrate Character Modeling with Maya and ZBrush.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explain model with both NURBS and polygonal geometry.

CO 2: Explain build and edit animation along path.

CO 3: Explain Character Modeling with Maya .

CO 4: Explain Character Modeling with ZBrush.

UNIT - I (14 Periods)

Polygonal Spaceship: Initial setup, Starting the ship, Air intake ports, The front cockpit, Creating a more organic look, Finishing the model, Texturing the ship.

Nurbs Spaceship: Initial setup, Main thruster, Construction history, The Hull, Trim Surfaces, Texturing Surfaces.

UNIT - II (14 Periods)

Animating the Ships: Stars and Planets, The Spaceship Scene.

Visual Effects: Initial set-up, Creating OPTIF/X, Particle Effects, Rendering.

UNIT - III (14 Periods)

Primitive Man: Initial set-up, Building a character - Drawing a skeleton leg, Adding IK chains to the leg, Rolling the foot, Orienting the toe, Creating geometry, Binding the geometry, Editing the sets, Adding a flexor, Creating the second leg, Create the torso and head, Building arms, Tuck and bulge, Duplicate the arm.

Animating a walk cycle: Initial set-up, Animate the pelvis, Animate the feet sliding, Edit the animation curves, Animate the feet, Animate the pelvic rotations, Animate the heel rotation, Setting keys for the spine, Keying the arm motion, The rotate plane IK solver, Animating a two-node camera, Props, color and lighting, Testing the motion, Rendering the animation.

UNIT - IV (14 Periods)

Introduction to ZBrush Modeling: Saving Custom Materials, Using ZSpheres, Exporting a Model from Maya, Exporting a Model from ZBrush to Maya, Rebuilding Bad Topology, Using HD Geometry, Using Smart Resym.

Creating a Video Game Character: Adding Detail to the Torso, Detailing the Legs, Creating the Feet, Finishing the Arms, Creating the Hands, Finishing the Head, Creating Clothes, Adding Hair.

Creating a Hyperreal Character: Adding Detail to the Torso, Detailing the Legs, Creating the Feet, Adding Detail to the Arms, Creating the Hands, Finishing the Head, Sculpting the Final Details in Maya.

Creating a Photo-Real Character: ZBrush Blocking, Working with 3D Layers, Sculpting with Symmetry, Using Alpha Images, Creating Wrinkles and Skin Pores, The Extract Tool, Sculpting Hair and Cloth, Using ZProject for Texturing, Posing the Character.

TEXT BOOKS:

1. Learning Maya, Don Chong, Bruce Darrell, Bob Gundu, Robert Magee, Alias|Wavefront- a divisionof Silicon Graphics Limited.
2. Character Modeling with Maya and ZBrush- Professional Polygonal Modeling Techniques, JasonPatnode, focal press 2008.

REFERENCES:

1. Maya- Professional Tips and Techniques, Lee Lanier, Wiley Publishing 2008.
2. Understanding 3D Animation using Maya, John Edgar Park, Springer.
3. An Essential Introduction to Maya Character Rigging, Cheryl Cabrera, Focal Press, first edition 2008.

SOFTWARE DESIGN PATTERNS

III B.Tech – VI Semester (18ITD31)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Software Engineering (18IT501)

Course Objectives:

COB 1: Demonstrate a thorough understanding of patterns and their underlying principles.

COB 2: Learn to create objects and classes with creational design patterns.

COB 3: Understand the architecture, creating it and moving from one to any, different structural patterns.

COB 4: Use behavioral design patterns when developing software applications.

Course Outcomes:

After the course the students are expected to be able to **CO 1:**

Explains design patterns creation and usage.

CO 2: Design various creational patterns.

CO 3: Describe structural patterns.

CO 4: Create behavioral patterns.

UNIT - I **(17 Periods)**

Introduction: What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT - II **(17 Periods)**

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

UNIT - III (18 Periods)

Structural Patterns: Adapter, Bridge, and Composite, Decorator, Façade, Flyweight, Proxy.

UNIT - IV (18 Periods)

Behavioral Patterns : Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns, What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOKS:

1. Design Patterns: Elements of Reusable Object-Oriented, Erich Gamma, Ralph Johnson, Richard Helm, John Vlissides, Pearson Education.

REFERENCES:

1. Head First Design Patterns By Eric Freeman-Oreilly-spd.
2. Design Patterns Explained By Alan Shalloway, Pearson Education.
3. Patterns in JAVA Vol-I By Mark Grand , WileyDreamTech.
4. Patterns in JAVA Vol-II By Mark Grand , WileyDreamTech.
5. JAVA Enterprise Design Patterns Vol-III By Mark Grand ,WileyDreamTech.

DEEP LEARNING

III B.Tech – VI Semester (18ITD32)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: Understand the architecture, training methodology and applications of Radial Basis Function Networks.

COB 2: Understand the architecture, training methodology and applications of Restricted Boltzmann Machines.

COB 3: Understand the architecture, training methodology and applications of Recurrent Neural Networks.

COB 4: Understand the architecture, training methodology and applications of Convolutional Neural Networks.

Course Outcomes:

After the course the students are able to

CO 1: Design and implement Radial Basis Function Networks.

CO 2: Design and implement Restricted Boltzmann Machines.

CO 3: Design and implement Recurrent Neural Networks.

CO 4: Design and implement Convolutional Neural Networks.

UNIT - I (15 Periods)

Radial Basis Function Networks: The Architecture of RBF Network, Training an RBF Network and Variations and Special Cases of RBF Networks.

UNIT - II (15 Periods)

Restricted Boltzmann Machines: Hopfield Networks, The Boltzmann Machine, Restricted Boltzmann Machines, Applications of Restricted Boltzmann Machines and Stacking Restricted Boltzmann Machines.

UNIT – III **(15 Periods)**

Recurrent Neural Networks (RNN): The Architecture of Recurrent Neural Networks, Training Recurrent Neural Networks, Long Short-Term Memory (LSTM) and Applications of Recurrent Neural Networks.

UNIT - IV **(15 Periods)**

Convolutional Neural Networks (CNN): The Architecture of a Convolutional Network, Training a Convolutional Network and Applications of Convolutional Networks.

TEXT BOOKS:

1.Neural Networks and Deep Learning Charu C. Aggarwal Springer

2.Neural Networks and Deep Learning by Michael Nielsen (Free online text book available at URL:http://neuralnetworksanddeeplearning.com/)

3.Deep Learning, Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press, 2016 (Free onlinetext book available at URL:- http://www.deeplearningbook.org)

REFERENCES:

1.Hands-On Machine Learning with Scikit-Learn and TensorFlow by Aurélien Géron, First Edition,O'Reilly publishers, 2017

2.Deep Learning with Python by Francois Chollet, First Edition, Manning publishers, 2017

DISTRIBUTED SYSTEMS

III B.Tech – VI Semester (18ITD33)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Operaring Systems (18IT305),Computer Networks (18IT405)

Course Objectives:

Students will be able to

COB1: Define a Distributed System and Understand the Goals of a Distributed Systems.

COB2: Know the importance of Synchronization between systems and also learn different algorithms for handling issues in Synchronizing systems.

COB3: Understand the importance of Replication of data and learn algorithms for maintaining it consistant.

COB4: Define a Fault Tolerant System and handle faulta and failures using different algorithms.

Course Outcomes:

After the course the students are expected to be able to

CO1: Explain Goals of Distributed systems.

CO2: Understand Synchronization and algorithms for synchrinizing.

CO3: Identify issues in Replication and Consistency of data after Replication.

CO4: Recognize different types of Faults and understand different Real time distributed systems that apply all the knowledge that is acquired.

UNIT - I (14 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 - II (14 Periods)

Processes: Threads, Clients, Servers, Code Migration.

Naming: Naming Entities -Names, Identifiers and Addresses, Name Resolution, theImplementation of a Name Space. Locating MobileEntities, Removing Unreferenced Entities.

UNIT - III (14 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 - IV (14 Periods)

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

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”, 2017, Maarten Van Steen publications .

REFERENCES:

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

ADHOC SENSOR NETWORKS

III B.Tech – VI Semester (18ITD34)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Computer Networks (18IT405)

Course Objectives:

CO1: To learn the fundamentals of Wireless sensor Networks, Applications, Network Architectures and Protocol Stack in Wireless sensor networks.

CO2: To illustrate Wireless Transmission Technology and Systems.

CO3: To gain the knowledge on Medium Access Control Protocols for Wireless Sensor Networks

CO4: To learn the Deployment and Configuration for wireless sensor networks

Course Outcomes:

After the course the students are expected to be able to

CLO1: Able to understand Architect sensor networks for various applications and explore Wireless transmission technology and systems.

CLO2: Learn Wireless Transmission Technology and Systems.

CLO3: Describe Medium Access Control Protocols for Wireless Sensor Networks.

CLO4: The ability to understand the Deployment and Configuration for wireless sensor networks

UNIT - I (14 Periods)

Introduction to Wireless Sensor Networks: Introduction, Applications of Wireless Sensor Networks, WSN Standards, IEEE 802.15.4, Zigbee.

Network Architectures and Protocol Stack: Network architectures for WSN, classification of WSN, protocol stack for WSN.

UNIT - II (14 Periods)

Wireless Transmission Technology and Systems: Wireless Transmission Technology and Systems – Radio Technology, Available Wireless Technologies.

Wireless Sensor Technology: Sensor Node Technology, Hardware and Software, Sensor Taxonomy, WN Operating Environment.

UNIT - III **(14 Periods)**

Medium Access Control Protocols for Wireless Sensor Networks: Fundamentals of MAC Protocols, MAC Protocols for WSNs, Contention-Based protocols: Power Aware Multi-Access with Signaling - Data-Gathering MAC.

Contention-Free Protocols: Low-Energy Adaptive Clustering Hierarchy, B-MAC, S-MAC. Dissemination Protocol for Large Sensor Network.

UNIT - IV **(14 Periods)**

Deployment and Configuration: Target tracking, Localization and Positioning, Coverage and Connectivity, Single-hop and Multihop Localization, Self-Configuring Localization Systems.

Routing Protocols and Data Management for Wireless Sensor Networks: Routing Challenges and Design Issues in Wireless Sensor Networks, Routing Strategies in Wireless Sensor Networks.

Routing protocols: data centric, hierarchical, location based energy efficient routing etc. Querying, Data Dissemination and Gathering.

TEXT BOOKS:

1. Kazem Sohraby, Daniel Minoli, Taieb Znati, "Wireless Sensor Networks, Technology, Protocols and Applications", Wiley, 2007

REFERENCES:

1. Holger Karl, Andreas Willig, "Protocols And Architectures for Wireless Sensor Networks", John Wiley,2005.
2. Jun Zheng, Abbas Jamalipour, "Wireless Sensor Networks: A Networking Perspective",Wiley, 2009. 3. Ian F. Akyildiz, Mehmet Can Vuran, "Wireless Sensor Networks", Wiley, 2010
4. Ibrahiem M. M. El Emary, S. Ramakrishnan, "Wireless Sensor Networks:

SOFT SKILLS LAB

III B.Tech – VI Semester (18ELL02)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

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, 2ndEdition, TMH.

5. “Emotional Intelligence”, Daniel Goleman.
6. “ The 7 Habits Of Highly Effective People“, Stephen R. Covey7. “Working in Teams”, Sandy Pokras.

DEEP LEARNING LAB

III B.Tech – VI Semester (18ITL62)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Use RBM feature extractor along with a LogisticRegression to improve classification accuracy onMNIST image dataset.
2. Using Recurrent Neural Network build a text classifier model to classify text in IMDB large moviereview dataset for sentiment analysis.
3. Using a character-based RNN read sequence of characters from a text document, train the model topredict the next character in the sequence
4. Using Convolutional Neural Network (CNN) build an image classifier model to classify image in CIFARimages dataset (https://www.cs.toronto.edu/ kriz/cifar.html).

CLOUD COMPUTING LAB

III B.Tech – VI Semester (18ITL63)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Develop a Cloud application using Java and deploy it to AWS cloud.
2. Demonstrate deploying and using Linux VM in the AWS Cloud.
3. Develop a Cloud application to demonstrate AWS Compute Services.
4. Develop a Cloud application using with Amazon Simple Storage Service(S3).
5. Develop a Cloud application using Amazon Container Service(ECS).
6. Develop a Cloud application to use Simple Notification Service(SNS).
7. Develop a Cloud application to use Simple Queue Service(SQS).
8. Develop a Cloud application using Amazon Kinesis.
9. Develop a Cloud application using Amazon Relational Database Service(RDS).
10. Develop a Cloud application to work with NoSQL database.
11. Develop a Cloud application to count the number of times that words occur within a text collectionusing AWS EMR.
12. Demonstrate the use of Amazon SageMaker for creating and using Machine Learning Model.

TEXT BOOKS:

1. Practical Amazon EC2, SQS, Kinesis, and S3: A Hands-On Approach to AWS - Sunil Gulabani,APress, 2017.
2. AWS Certified Developer – Associate Guide, Vipul Tankariya & Bhavin Parmar, Packt PublishingLtd. 2017.