SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

B.TECH INFORMATION TECHNOLOGY

REGULATIONS 2015

REVISED CURRICULUM AND SYLLABUS
(1st SEMESTER TO 8th SEMESTER)

(FOR THOSE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2015-2016 ONWARDS)

Approved in the Academic Council Meeting held on 25.08.2018

CHAIRMAN

ACADEMIC COUNCIL

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Department of Information Technology

OVERALL COURSE STRUCTURE

Category	Total No. of Courses	Credits	Percentage
Humanities and Social Sciences (HS)	5	11	7
Basic Sciences (BS)	9	27	16
Engineering Sciences (ES)	10	25	15
Professional Core (PC)	30	63	37
Employability Enhancement Course(EEC)	3	16	9
Professional Electives (PE)	6	18	11
Open Electives (OE)	3	9	5
TOTAL	**66**	**169**	**100**

COURSE CREDITS – SEMESTERWISE

Branch	I	II	III	IV	V	VI	VII	VIII	TOTAL
IT	**22**	**21**	**22**	**23**	**22**	**23**	**16**	**20**	**169**

Semester I

Course Code	Course Title	L	T	P	C	Prerequisite
THEORY						
15UEN101	Technical English (Common to ALL)	2	0	0	2	Nil
15UMA102	Engineering Mathematics – I (Common to ALL)	3	2	0	4	Nil
15UPH103	Engineering Physics (Common to ALL)	3	0	0	3	Nil
15UCY105	Applied Chemistry (Common to CSE,ECE,EEE,IT and EIE)	3	0	0	3	Nil
15UCS107	Computer Programming (Common to ALL)	3	0	0	3	Nil
15UME108	Engineering Graphics (Common to ALL)	3	2	0	4	Nil
PRACTICAL						
15UCS109	Computer Programming Laboratory (Common to ALL)	0	0	2	1	Nil
15UCS111	Engineering Fundamental Laboratory (Common to CSE,ECE and IT)	0	0	2	1	Nil
15UGS112	Basic Sciences Laboratory I (Common to ALL)	0	0	2	1	Nil
	TOTAL	**17**	**4**	**6**	**22**	
Total No. of Credits – 22						

Semester II

Course Code	Course Title	L	T	P	C	Prerequisite
THEORY						
15UEN201	Business English and Presentation Skills (Common to ALL)	3	0	0	3	Nil
15UMA202	Engineering Mathematics – II (Common to ALL)	3	2	0	4	Nil
15UPH205	Semiconductor Physics and OPTO Electronics (Common to CSE, ECE and IT)	3	0	0	3	Nil
15UCY207	Environmental Science (Common to ALL)	3	0	0	3	Nil
15UCS208	Digital Principles and System design (Common to CSE and IT)	3	0	0	3	Nil
15UIT209	Problem Solving and Programming Techniques	3	0	0	3	Nil
PRACTICAL						
15UGS210	Basic Sciences Laboratory II (Common to ALL)	0	0	2	1	Nil
15UIT211	Programming Techniques Laboratory	0	0	2	1	Nil
	TOTAL	**18**	**2**	**4**	**21**	
Total No. of Credits – 21						

Semester III

Course Code	Course Title	L	T	P	C	Prerequisite
THEORY						
15UMA322	Probability, Statistics and Queueing Systems (Common to CSE and IT)	3	2	0	4	Nil
15UIT302	Data structures and Algorithms	3	0	0	3	15UIT209
15UCS303	Computer Organization and Architecture (Common to CSE and IT)	2	2	0	3	Nil
15UIT304	Object Oriented Programming	3	0	0	3	15UCS107
15UIT305	Operating systems (Common to CSE and IT)	3	0	0	3	Nil
15UIT306	Analog and Digital Communication	3	0	0	3	15UCS208
PRACTICAL						
15UIT307	Object Oriented Programming Laboratory	0	0	2	1	Nil
15UIT308	Data Structures and Algorithms Laboratory	0	0	2	1	Nil
15UIT309	Operating Systems Laboratory (Common to CSE and IT)	0	0	2	1	Nil
	TOTAL	**17**	**4**	**6**	**22**	
Total No. of Credits – 22						

Semester IV

Course Code	Course Title	L	T	P	C	Prerequisite
THEORY						
15UMA421	Discrete Mathematics (Common to CSE and IT)	3	2	0	4	Nil
15UCS402	Java Programming (Common to CSE and IT)	3	0	0	3	15UCS107
15UIT403	Introduction to Human Computer Interaction	3	0	0	3	Nil
15UIT404	Software Engineering Methodologies	3	0	0	3	Nil
15UIT405	Database Management Systems	3	0	0	3	Nil
15UIT406	Computer Networks	3	0	0	3	Nil
15UGS431	Reasoning and Quantitative Aptitude (Common to ALL)	1	0	0	1	Nil
PRACTICAL						
15UCS407	Java Programming Laboratory (Common to CSE and IT)	0	0	2	1	Nil
15UIT408	Database Management Systems Laboratory	0	0	2	1	Nil
15UIT409	Computer Networks Laboratory	0	0	2	1	Nil
	TOTAL	**19**	**2**	**6**	**23**	
Total No. of Credits – 23						

Semester V

Course Code	Course Title	L	T	P	C	Prerequisite
THEORY						
15UCS501	Internet and web Technology (Common to CSE and IT)	3	0	0	3	Nil
15UIT502	Data Warehousing and Data Mining	3	0	0	3	Nil
15UIT503	Graphics and Multimedia (Common to CSE and IT)	3	0	0	3	Nil
15UIT504	Analysis and Design of Algorithm	3	0	0	3	Nil
	Elective I	3	0	0	3	-
	Elective II	3	0	0	3	-
PRACTICAL						
15UCS507	Internet and Web Technology Laboratory (Common to CSE and IT)	0	0	2	1	Nil
15UIT508	Data Warehousing and Data Mining Laboratory	0	0	2	1	Nil
15UIT509	Graphics and Multimedia Laboratory (Common to CSE and IT)	0	0	2	1	Nil
15UGS531	Soft Skills and Communication Laboratory (CSE,EEE, IT,ECE)	0	0	2	1	Nil
	TOTAL	**18**	**0**	**8**	**22**	
Total No. of Credits – 22						

Semester VI

Course Code	Course Title	L	T	P	C	Prerequisite
THEORY						
15UIT601	Cryptography and Network Security	3	0	0	3	Nil
15UIT602	Mobile Applications Development (Common to CSE and IT)	3	0	0	3	Nil
15UIT603	Compiler Design	3	0	0	3	Nil
	Elective III	3	0	0	3	-
	Elective IV	3	0	0	3	-
	Open Elective I	3	0	0	3	-
PRACTICAL						
15UIT607	Security Laboratory	0	0	2	1	Nil
15UIT608	Mobile Application Development Laboratory (Common to CSE and IT)	0	0	2	1	Nil
15UIT609	Technical Project	0	0	6	3	Nil
	TOTAL	**18**	**0**	**10**	**23**	
Total No. of Credits – 23						

Semester VII

Course Code	Course Title	L	T	P	C	Prerequisite
THEORY						
15UME701	Project Management and Finance (Common to MECH, CSE, ECE, EEE, IT, and EIE)	3	0	0	3	Nil
15UCS702	Insight into Cloud Computing (Common to CSE and IT)	3	0	0	3	Nil
15UIT703	Fundamentals of Image Processing	2	0	0	2	Nil
	Elective V	3	0	0	3	-
	Open Elective II / Multidisciplinary Project Phase I	3	0	0	3	-
PRACTICAL						
15UCS706	Cloud Computing Laboratory (Common to CSE and IT)	0	0	2	1	Nil
15UIT707	Image Processing Laboratory	0	0	2	1	Nil
	TOTAL	**14**	**0**	**4**	**16**	
Total No. of Credits – 16						

Semester VIII

Course Code	Course Title	L	T	P	C	Prerequisite
THEORY						
15UME801	Professional Ethics (Common to ALL)	2	0	0	2	Nil
	Elective VI	3	0	0	3	-
	Open Elective III	3	0	0	3	-
PRACTICAL						
15UIT804	Project Work	0	0	24	12	-
	TOTAL	**8**	**0**	**24**	**20**	
Total No. of Credits – 20						

PROFESSIONAL ELECTIVES

Course Code	Course Title	L	T	P	C
PROFESSIONAL ELECTIVES					
15UIT901	Programming Paradigms	3	0	0	3
15UIT902	Formal Language and Automata	3	0	0	3
15UIT903	Artificial Intelligence and Knowledge Engineering	3	0	0	3
15UIT904	Distributed Operating System	3	0	0	3
15UIT905	Internet of Everything	3	0	0	3
15UIT906	Embedded Systems	3	0	0	3
15UIT907	Next Generation Networks	3	0	0	3
15UIT908	Paradigms in Green Computing	3	0	0	3
15UIT909	Wireless Communication	3	0	0	3
15UIT910	Building Enterprise Applications	3	0	0	3
15UIT911	Software Testing	3	0	0	3
15UIT912	Adhoc and Sensor Networks	3	0	0	3
15UIT913	Data Administration and Tuning	3	0	0	3
15UIT914	Data Analytics	2	0	2	3
15UIT915	System Software Internals	3	0	0	3
15UIT916	Intelligent Agents	3	0	0	3
15UIT917	Enterprise Architectures	3	0	0	3
15UIT918	Database Technology	2	0	2	3
15UIT919	Free and Open Source Software	2	0	2	3
15UIT920	Web Mining and Social Networking	3	0	0	3
15UIT921	Ethical Hacking and Information Forensics	3	0	0	3
15UIT922	Semantic Web Engineering	3	0	0	3
15UIT923	Neuro Fuzzy Systems	3	0	0	3
15UIT924	Agile Software Development(Common to CSE and IT)	3	0	0	3
15UIT925	Information Retrieval Methods	3	0	0	3
15UIT926	Visualization Techniques	3	0	0	3
15UIT927	Mobility Engineering	3	0	0	3
15UIT928	Nature and Bio-Inspired Computing	3	0	0	3
15UIT929	Unix Internals	3	0	0	3
15UIT930	Programming with Python	3	0	0	3
15UIT931	Object Oriented System Design	3	0	0	3
15UIT932	Organizational Behavior	3	0	0	3
15UCS902	Information Storage Management	3	0	0	3

15UCS925	Business Intelligence and its Applications	3	0	0	3

INTER DISCIPLINARY ELECTIVE COURSE

Course Code	Course Title	L	T	P	C
15UGM951	Smart Manufacturing (Common to IT &Mech)	3	0	0	3
15UGM953	Big Data And Iot In Medical Applications (Common to IT & Bio-Medical)	3	0	0	3

MULTIDISCIPLINARY ELECTIVE COURSE

Course Code	Course Title	L	T	P	C
15UGM952	Automation in Agriculture (Common to Mech, IT &Agri)	3	0	0	3

ONE CREDIT COURSES

CourseCode	Course Title	L	T	P	C
15UIT861	IT- Infrastructure Management Service	1	0	0	1
15UCS861	Software Project Management	1	0	0	1
15UIT862	Introduction to 3D Animation	1	0	0	1
15UIT863	Web Programming with PHP	1	0	0	1
15UIT864	Android Programming – I	1	0	0	1
15UIT865	Android Programming – II	1	0	0	1
15UIT866	Foundation Program 5.0	1	0	0	1
15UIT867	Logics of Programming	1	0	0	1
15UIT868	Arduino Raspberry Pi	1	0	0	1
15UIT869	No SQL	1	0	0	1
15UIT870	PHP Fundamentals	1	0	0	1

OPEN ELECTIVES

Course Code	Course Title	L	T	P	C
15UIT971	PC Troubleshooting	3	0	0	3
15UIT972	Social Networks	3	0	0	3
15UIT973	Cyber Forensics Technology	3	0	0	3
15UIT974	Animation Technology	3	0	0	3
15UIT975	Computer architecture	3	0	0	3
15UIT976	Fundamentals of Database Management Systems	2	0	2	3
15UIT977	Learning IT Essentials by Doing	3	0	0	3
15UIT978	Website Designing	3	0	0	3

MANDATORY COURSES

Course Code	Course Title	L	T	P	C
15UGS331	Value Education and Human Rights	2	0	0	P/F
	Personality and Social development 1. PSD01 Sports and other Extra – Curricular Activities 2. PSD02 National Service Scheme 3. PSD03 Club Activities				P/F
	Skill Development Courses 1. SD01 Co-Curricular Activities 2. SD02 English Proficiency Certification 3. SD03 Foreign Languages 4. SD04 Soft Skills and Aptitude 5. SD05 Aptitude Proficiency Certificate 6. SD06 Intellectual Property Rights				P/F

Department of Information Technology

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Branch	I	II	III	IV	V	VI	VII	VIII	TOTAL
IT	**22**	**21**	**22**	**23**	**22**	**23**	**16**	**20**	**169**

WINTER SEMESTER

Course Code	Course Title	L	T	P	C	Category
15UEN101	Technical English (Common to ALL)	2	0	0	2	HS
15UMA102	Engineering Mathematics – I (Common to ALL)	3	0	0	4	BS
15UPH103	Engineering Physics (Common to ALL)	3	0	0	3	BS
15UCY105	Applied Chemistry (Common to CSE,ECE,EEE,IT and EIE)	3	0	0	3	BS
15UCS107	Computer Programming (Common to ALL)	3	0	0	3	ES
15UME108	Engineering Graphics (Common to ALL)	3	0	0	4	ES
15UCS109	Computer Programming Laboratory	0	0	0	1	ES
15UCS111	Engineering Fundamental Laboratory (Common to CSE,ECE and IT)	0	0	0	1	ES
15UGS112	Basic Sciences Laboratory I	0	0	0	1	BS
15UMA322	Probability Statistics and Queueing Systems(Common to CSE and IT)	3	0	0	4	BS
15UIT302	Data Structures and Algorithms	3	0	0	3	PC
15UCS303	Computer Organization and Architecture (Common to CSE and IT)	3	0	0	3	ES
15UIT304	Object Oriented Programming	3	0	0	3	PC
15UIT305	Operating Systems (Common to CSE and IT)	3	0	0	3	PC
15UIT306	Analog and Digital Communication	3	0	0	3	ES
15UIT307	Object Oriented Programming Laboratory	0	0	2	1	PC
15UIT308	Data Structures and Algorithms Laboratory	0	0	0	1	PC
15UIT309	Operating Systems Laboratory (Common to CSE and IT)	0	0	2	1	PC
15UCS501	Internet and Web Technology (Common to CSE and IT)	3	0	2	3	PC
15UIT502	Data Warehousing and Data Mining	3	0	0	3	PC
15UIT503	Graphics and Multimedia (Common to CSE and IT)	3	0	0	3	PC

Course Code	Course Title	L	T	P	C	Category
15UIT504	Analysis and Design of Algorithms	3	0	0	3	PC
15UCS507	Internet and Web Technology Laboratory (Common to CSE and IT)	0	0	0	1	PC
15UIT508	Data Warehousing and Data Mining Laboratory	0	0	0	1	PC
15UIT509	Graphics and Multimedia Laboratory (Common to CSE and IT)	0	0	2	1	PC
15UGS531	Soft Skills and Communication Laboratory (CSE,EEE, IT,ECE)	0	0	2	1	HS
15UME701	Project Management and Finance (Common to MECH, CSE, ECE, EEE, IT, and EIE)	3	0	0	3	ES
15UCS702	Insight into Cloud Computing (Common to CSE and IT)	3	0	0	3	PC
15UIT703	Fundamentals of Image Processing	2	0	0	2	PC
15UIT706	Cloud Computing Laboratory (Common to CSE and IT)	0	0	2	1	PC
15UIT707	Image Processing Laboratory	0	0	2	1	PC

SUMMER SEMESTER

Course Code	Course Title	L	T	P	C	Category
15UEN201	Business English and Presentation Skills (Common to ALL)	3	0	0	3	HS
15UMA202	Engineering Mathematics- II (Common to ALL)	3	2	0	4	BS
15UPH205	Semiconductor Physics and OPTO Electronics (Common to CSE, ECE and IT)	3	0	0	3	BS
15UCY207	Environmental Science (Common to ALL)	3	0	0	3	HS
15UCS208	Digital Principles and System Design (Common to CSE and IT)	3	0	0	3	ES
15UIT209	Problem Solving and Programming Techniques	3	0	0	3	ES
15UCS210	Basic Sciences Laboratory II (Common to ALL)	0	0	2	1	BS
15UIT211	Programming Techniques Laboratory	0	0	2	1	ES
15UMA421	Discrete Mathematics (Common to CSE and IT)	3	2	0	4	BS
15UCS402	Java Programming (Common to CSE and IT)	3	0	0	3	PC
15UIT403	Introduction to Human Computer Interaction	3	0	0	3	PC
15UIT404	Software Engineering Methodologies	3	0	0	3	PC
15UIT405	Database Management Systems	3	0	0	3	PC
15UIT406	Computer Networks	3	0	0	3	PC
15UCS407	Java Programming Laboratory (Common to CSE and IT)	0	0	2	1	PC
15UIT408	Database Management Systems Laboratory	0	0	2	1	PC
15UIT409	Computer Networks Laboratory	0	0	2	1	PC
15UGS431	Reasoning and Quantitative Aptitude (Common to ALL)	1	0	0	1	EEC
15UIT601	Cryptography and Network Security	3	0	0	3	PC
15UIT602	Mobile Applications Development (Common to CSE and IT)	3	0	0	3	PC
15UIT603	Compiler Design	3	0	0	3	PC
15UIT607	Security Laboratory	0	0	2	1	PC
15UIT608	Mobile Applications Development (Common to CSE and IT)	0	0	2	1	PC
15UIT609	Technical Project	0	0	6	3	EEC
15UME801	Professional Ethics (Common to ALL)	2	0	0	2	HS
15UIT804	Project Work	0	0	24	12	EEC

PROFESSIONAL ELECTIVES

Course Code	Course Title	L	T	P	C	Category
PROFESSIONAL ELECTIVES						
15UIT901	Programming Paradigms	3	0	0	3	PE
15UIT902	Formal Language and Automata	3	0	0	3	PE
15UIT903	Artificial Intelligence and Knowledge Engineering	3	0	0	3	PE
15UIT904	Distributed Operating System	3	0	0	3	PE
15UIT905	Internet of Every Thing	3	0	0	3	PE
15UIT906	Embedded System	3	0	0	3	PE
15UIT907	Next Generation Networks	3	0	0	3	PE
15UIT908	Paradigms in Green Computing	3	0	0	3	PE
15UIT909	Wireless Communication	3	0	0	3	PE
15UIT910	Building Enterprise Applications	3	0	0	3	PE
15UIT911	Software Testing	3	0	0	3	PE
15UIT912	Adhoc and Sensor Networks	3	0	0	3	PE
15UIT913	Data Administration and Tuning	3	0	0	3	PE
15UIT914	Data Analytics	2	0	2	3	PE
15UIT915	System Software Internals	3	0	0	3	PE
15UIT916	Intelligent Agents	3	0	0	3	PE
15UIT917	Enterprise Architectures	3	0	0	3	PE
15UIT918	Database Technology	2	0	2	3	PE
15UIT919	Free and Open source Software	2	0	2	3	PE
15UIT920	Web Mining and Social Networking	3	0	0	3	PE
15UIT921	Ethical Hacking and Information Forensics	3	0	0	3	PE
15UIT922	Semantic Web Engineering	3	0	0	3	PE
15UIT923	Neuro Fuzzy Systems	3	0	0	3	PE
15UIT924	Agile Software Development	3	0	0	3	PE
15UIT925	Information Retrieval Methods	3	0	0	3	PE
15UIT926	Visualization Techniques	3	0	0	3	PE
15UIT927	Mobility Engineering	3	0	0	3	PE
15UIT928	Nature and Bio-Inspired Computing	3	0	0	3	PE
15UIT929	Unix Internals	3	0	0	3	PE
15UCS902	Information Storage Management	3	0	0	3	PE
15UCS925	Business Intelligence and its Applications	3	0	0	3	PE
15UIT930	Programming with Python	3	0	0	3	PE
15UIT931	Object Oriented System Design	3	0	0	3	PE

15UIT932	Organizational Behavior	3	0	0	3	PE

INTER DISCIPLINARY ELECTIVE COURSE

Course Code	Course Title	L	T	P	C	Category
15UGM951	Smart Manufacturing (Common to IT &Mech)	3	0	0	3	ES
15UGM953	Big Data And Iot In Medical Applications (Common to IT & Bio-Medical)	3	0	0	3	ES

MULTIDISCIPLINARY ELECTIVE COURSE

Course Code	Course Title	L	T	P	C	Category
15UGM952	Automation in Agriculture (Common to Mech, IT &Agri)	3	0	0	3	ES

ONE CREDIT COURSES

CourseCode	Course Title	L	T	P	C	Category
15UIT861	IT- Infrastructure Management Service	1	0	0	1	EEC
15UCS861	Software Project Management	1	0	0	1	EEC
15UIT802	Introduction to 3D Animation	1	0	0	1	EEC
15UIT863	Web Programming with PHP	1	0	0	1	EEC
15UIT864	Android Programming – I	1	0	0	1	EEC
15UIT865	Android Programming – II	1	0	0	1	EEC
15UIT866	Foundation Program 5.0	1	0	0	1	EEC
15UIT867	Logics of Programming	1	0	0	1	EEC
15UIT868	Arduino Raspberry Pi	1	0	0	1	EEC
15UIT869	No SQL	1	0	0	1	EEC
15UIT870	PHP Fundamentals	1	0	0	1	EEC

OPEN ELECTIVES

Course Code	Course Title	L	T	P	C	Category
15UIT971	PC Trouble shooting	3	0	0	3	OE
15UIT972	Social Networks	3	0	0	3	OE
15UIT973	Cyber Forensics Technology	3	0	0	3	OE
15UIT974	Animation Technology	3	0	0	3	OE
15UIT975	Computer architecture	3	0	0	3	OE
15UIT976	Fundamentals of Database Management Systems	3	0	0	3	OE
15UIT977	Learning IT Essentials by Doing	3	0	0	3	OE
15UIT978	Website Designing	3	0	0	3	OE

MANDATORY COURSES

Course Code	Course Title	L	T	P	C	Category
15UGS331	Value Education and Human Rights	2	0	0	P/F	HS
	Personality and Social development 1. PSD01 Sports and other Extra – Curricular Activities 2. PSD02 National Service Scheme 3. PSD03 Club Activities				P/F	HS
	Skill Development Courses 1. SD01 Co-Curricular Activities 2. SD02 English Proficiency Certification 3. SD03 Foreign Languages 4. SD04 Soft Skills and Aptitude 5. SD05 Aptitude Proficiency Certificate 6. SD06 Intellectual Property Rights				P/F	SDC

Semester I

Course Code	Course Title	L	T	P	C
THEORY					
15UEN101	Technical English (Common to ALL)	2	0	0	2
15UMA102	Engineering Mathematics – I (Common to ALL)	3	2	0	4
15UPH103	Engineering Physics (Common to ALL)	3	0	0	3
15UCY105	Applied Chemistry (Common to CSE,ECE,EEE,IT and EIE)	3	0	0	3
15UCS107	Computer Programming (Common to ALL)	3	0	0	3
15UME108	Engineering Graphics (Common to ALL)	3	2	0	4
PRACTICAL					
15UCS109	Computer Programming Laboratory (Common to ALL)	0	0	2	1
15UCS111	Engineering Fundamental Laboratory (Common to CSE,ECE and IT)	0	0	2	1
15UGS112	Basic Sciences Laboratory I (Common to ALL)	0	0	2	1
	TOTAL	**17**	**4**	**6**	**22**
Total No. of Credits – 22					

Syllabus under Regulation 2015
(Common to all Branches of Engineering)
I Semester

15UEN101	TECHNICAL ENGLISH	L	T	P	C
		2	0	0	2

PRE-REQUISITES:

COURSE OBJECTIVE:

- To enhance the vocabulary of students
- To strengthen the application of functional grammar and basic skills
- To improve the language proficiency of students

UNIT I Click here to enter text. **6**

Grammar - Parts of Speech-Tense – **Vocabulary** – Technical Word Formation- Prefix- suffix - Synonyms and Antonyms– **Writing** – Instructions – Formal Letters - **Reading** Comprehension - Prose: A Nation's Strength – Dr. Karan Singh

UNIT II Click here to enter text. **6**

Grammar – Concord -'Wh' Questions – **Vocabulary** – One Word Substitutes – Listening & Speaking – Conducting Meetings – **Writing** - Preparation of the Checklist, Essaywriting – **Reading** -Prose: My Vision of India-Dr.A.P.J.AbdulKalam

UNIT III Click here to enter text. **6**

Grammar – Voice – **Vocabulary**– Compound Nouns**Writing** – Minutes – Agenda -Transformation of Information (Transcoding)-**Reading Prose**: Professions of Women-Virginia Woolf.

UNIT IV Click here to enter text. **6**

Grammar - Conditional clauses - **Vocabulary** - Idioms & Phrases - **Writing** Letters to Editor - Making Invitations - Acceptance & Declining - Summarizing –**Reading** - Prose: Computers-Peter Laurie

UNIT V Click here to enter text. **6**

Grammar – Determiners – **Vocabulary** – Homophones & Homonyms – **Writing** Recommendations-Note Making - Report Writing-**Reading** – Prose: What We Must Learn From the West-Narayana Murthy

TOTAL: 30(L) = 30 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

- Use grammar effectively in writing meaningful sentences and paragraphs.
- Exhibit improved reading comprehension and vocabulary.
- Demonstrate writing skills in various formal situations.
- Demonstrate improved oral fluency.
- Presenting reports on various purposes.

TEXT BOOKS:

1. S.M.Rajasangar*Technical English*, Rathna Arts,Sivakasi, 2018.

REFERENCE BOOKS:

1. AsrafRizvi.M, Effective Technical Communication, New Delhi, Tata McGraw-Hill Publishing Company Limited,2007.

2. Lakshminarayanan.K.R,EnglishforTechnicalCommunication,Chennai,ScitechPublications(India)Pvt. Ltd,2004.

		L	T	P	C
15UMA102	**ENGINEERING MATHEMATICS – I**				
	(Common to ALL Branches)	**3**	**2**	**0**	**4**

OBJECTIVES :

- To make the students capable of identifying algebraic eigenvalue problems from practical areas and obtain the eigen solutions in certain cases.
- To make the students knowledgeable in integrating various types of functions using various integration methods.
- To familiarize the students with the basic rules of differentiation and use them to find derivatives of products and quotientsthat they might encounter in their studies of other subjects in the same or higher semesters.

UNIT I DIFFERENTIAL CALCULUS 9 + 6

Introduction – Definition of derivatives – Limits and Continuity – Differentiation techniques (Product rule, Quotient rule, Chain rule) – Successive differentiation (n^{th} derivatives) – Leibnitz theorem (without proof) – Maclaurin's series – Physical Applications (Newton's law of cooling – Heat flow problems, Rate of decay of radioactive materials - Chemical reactions and solutions, Ohm's law, Kirchoff's law – Simple electric circuit problems)

UNIT II FUNCTIONS OF SEVERAL VARIABLES 9 + 6

Partial derivatives – Euler's theorem for homogenous functions – Total derivatives –Differentiation of implicit functions – Jacobian – Taylor's expansion – Maxima and Minima – Method of Lagrangian Multipliers.

UNIT III INTEGRAL CALCULUS 8 + 6

Definitions and concepts of integrals – Methods of integration (Decomposition method, Substitution method, Integration by parts) – Definite integrals – Properties and problems – Reduction formulae – Beta and Gamma functions.

UNIT IV MULTIPLE INTEGRALS 8+ 6

Double integration – Cartesian and Polar coordinates – Change of order of integration – Area as a double integral - Change of variables between Cartesian and Polar coordinates – Triple integration

in Cartesian coordinates – Volume as triple integral.

UNIT V MATRICES 8 + 6

Eigenvalue and eigenvector of a real matrix – Characteristic equation – Properties – Cayley-Hamilton theorem (excluding Proof) – Orthogonal reduction –(transformation of a symmetric matrix to diagonal form) – Quadratic form – Reduction of quadratic form to canonical form by orthogonal transformation.

SUPPLEMENT TOPIC(for internal evaluation only)3

Evocation /Application of Mathematics, Quick Mathematics – Speed Multiplication and DivisionApplications of Matrices.

TOTAL : 45 (L) + 30 (T) = 75 Periods

COURSE OUTCOMES:

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

1. Analyze functions using limits, continuity and derivatives to solve problems involving these functions.
2. Use the Lagrange multiplier method to predict extreme values of functions with constraints and to find the absolute maximum and minimum of a function on different domains.
3. Apply the various methods of integration for evaluating definite integrals.
4. Apply the knowledge of multiple integrals to findthe area and volume of region bounded by the given curves.
5. Find Eigen values and Eigenvectors for symmetric and non-symmetric matrices

TEXT BOOKS:

1. BALI N. P and MANISH GOYAL, “A Text book of Engineering Mathematics”, Laxmi Publications (P) Ltd, New Delhi, 8th Edition, (2011).
2. GREWAL. B.S, “Higher Engineering Mathematics”, Khanna Publications, New Delhi, 42ndEdition, (2012).

REFERENCE BOOKS:

1. RAMANA B.V, “Higher Engineering Mathematics”, Tata McGraw Hill Publishing Company, New Delhi, 11th Reprint, (2010).
2. GLYN JAMES, “Advanced Engineering Mathematics”,Pearson Education, New Delhi, 7th Edition, (2007).
3. JAIN R.K and IYENGAR S.R.K,” Advanced Engineering Mathematics”, Narosa Publishing House, New Delhi, 3rd Edition, (2007).
4. BHARATI KRISHNA TIRTHAJI, “Vedic Mathematics - Mental Calculation”,MotilalBanarsidass Publications, New Delhi, 1st Edition, (1965).
5. KREYSZIG. E, “Advanced Engineering Mathematics”, John Wiley & Sons, New York, 10th Edition, (2011).
6. P.SIVARAMAKRISHNA DAS, E.RUKMANGADACHARI“Engineering mathematics”, volume1, Pearson Edison New Delhi, 2nd Edition, (2013).

		L	T	P	C
15UPH103	**ENGINEERING PHYSICS (COMMON TO ALL BRANCHES)**	3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To develop the research interest in crystal physics
- To make students to understand classification of sound and applications of Ultrasonic's
- To use the principles of Lasers and its types
- To apply principles of Quantum physics in engineering field
- To develop knowledge on principles of Thermal Physics

UNIT I CRYSTAL PHYSICS 9

Crystalline – Amorphous materials – single and poly crystal- Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – parameters of Unit cell – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – crystal growth technique- Bridgeman method.

UNIT II ACOUSTICS AND ULTRASONICS 9

Classification of sound – decibel- weber- Fechner law – Units of Loudness- decibel- phon- sone- Reverberation – Absorption Coefficient –Introduction to ultrasonic- Magnetostriction effect – piezoelectric effect - piezoelectric generator- Detection of ultrasonic waves - properties – Cavitations -Velocity measurement – acoustic grating - Industrial applications – SONAR .

UNIT III WAVE OPTICS AND LASERS 9

Introduction – interference – refractive index –Expression for plane, circularly and elliptically polarized light LASER: Introduction- Principles of Laser- Einstein theory of stimulated emission- Population inversion Methods - Types of lasers – Co_2 laser - semiconductor laser – homojunction – heterojunction - Applications.

UNIT IV QUANTUM PHYSICS 9

Introduction to black body- de Broglie wavelength – Schrödinger's wave equation – Time dependent – Time independent equation – Physical significance of wave function - Compton Effect – Theory and experimental verification .

UNIT V PROPERTIES OF SOLIDS AND THERMAL PHYSICS 9

Elasticity- Hooke's law – Different types of moduli of elasticity– stress -strain diagram – Poisson's ratio –Factors affecting elasticity –Bending moment – Depression of a cantilever –Young's modulus by uniform bending - Thermal conductivity- Newton's law of cooling – Lee's disc method - Concept of Entropy.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Apply the crystal growth techniques
- Discuss the basic concepts of Acoustics and Ultrasonic's.
- Acquire knowledge about wave optics and Lasers
- Summarize the principles of quantum physics
- Explain the methods of thermal conduction.

TEXT BOOKS:

1. Dr. Mani.P, "A Text Book of Engineering Physics", Dhanam Publications,Edition ,2014, Chennai.
2. Rajendran.V, "Engineering,Physics", Tata Mc-Graw Hill Publishing Company limited, New Delhi, Revised Edition 2013.
3. Palanisami P.K., "Physics For Engineers", Scitech Publications (India), Pvt Ltd., Chennai, 2014.

REFERENCE BOOKS:

1. Raghuvenshi G.S., "Engineering Physics", PHI Learning Private Limited, New Delhi, Revised Edition 2014.
2. Arul doss .G., "Engineering Physics", PHI Learning Limited, New Delhi, Revised Edition 2013.
3. Marikani .A., "Engineering Physics", PHI Learning Private Limited, New Delhi, Revised Edition 2012.
4. Sankar B.N., and Pillai .S.O., "A Text book of Engineering Physics", New Age International Publishers Private Limited, New Delhi, Revised Edition 2013.
5. Avadhanulu M.N. and Kshirsagar P.G., "A Textbook: of Engineering Physics", S.Chand& Company Ltd., New Delhi, 2015.

15UCY105	APPLIED CHEMISTRY (Common to ECE, EEE, EIE, CSE, IT, & Biomedical Engineering)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Introduction to the fundamental concepts of chemical bonds.
- Understand the principles and applications of corrosion science.
- Gain knowledge about energy Storage devices &Electrochemical sensors.
- Understand the principlesand applications of spectroscopy and the concept of green chemistry.
- Acquire knowledge on smart materials.

UNIT I CHEMICAL BONDING 9

Chemical Bonding: Electronic Configuration– Ionic Bond - Covalent Bond – Metallic bond –Aufbau principle, Octet Rule, Pauli Exclusion principle, Molecular Orbital theory, Valence bond theory and its limitations, Various types of hybridization (SP, SP^2, SP^3)(Homo nuclear& H_2, N_2, O_2) and shapes of molecules based on MO theory -bond strength and bond energy, Born-Haber cycle, Fajan's rule–Non Covalent Bonding-Hydrogen bonding, Vander Waals forces.

UNIT II ELECTRO CHEMISTRY AND CORROSION 9

Electrochemistry: Introduction -Electrochemical cells- reversible and irreversible cells – EMF – measurement of EMF-Single electrode potential-Nernst equation.

Chemical corrosion: Introduction- Definition- Types - (Dry corrosion, mechanism and its Example)- Electrochemical corrosion (Wet corrosion, mechanism and its Types – Galvanic & Differential aeration Corrosion- Pitting, crevice & Wire fence corrosion). Factors influencing rate of corrosion. Corrosion prevention - Cathodic protection, Corrosion inhibitors, and Protective coatings – Paint, Electroplating – Gold plating-Risk Analysis -Electroless plating – Nickel plating

UNIT III CONVENTIONAL ENERGY STORAGE DEVICES AND SENSORS 9

Conventional devices - Batteries- Primary and secondary batteries- Construction, working and applications of Zn – MnO_2, Lead acid storage and Cd batteries. Fuel cells – Differences between battery and fuel cell, construction and working of H_2 – O_2 fuel cell.

Electrochemical sensors: Chemically modified electrode (CMEs) – Concept, CMEs sensors, Chemical sensors – gas sensors – ion selective electrodes, principle, types (solid state membranes and liquid membranes) and applications. Biosensors – electrochemical biosensors – glucose

biosensors.

UNIT IV INSTRUMENTATION FOR ANALYTICAL METHODS AND GREEN CHEMISTRY 9

Beer-Lamberts law - Principle, instrumentation and applications –UV-Visible spectrophotometer- X-ray diffractometer - Thermo Gravimetric Analysis (TGA) - Differential Thermal Analysis (DTA)- Differential Scanning Colorimetry (DSC).

Green chemistry – Concept, importance, principles – e- waste disposal

UNIT V POLYMERS& SMART MATERIALS 9

Introduction- Terminology- structure and properties -Types of Polymerisation-Conducting polymers – Chemical and Electrochemical doping; Charge transfer polymer – Polymers filled with conductive solids, Organic Light emitting diodes – Principles and applications, Liquid crystals – definition and applications.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Have sound knowledge on the basics of chemistry related to bonding.
- Know the principles, various types of corrosion and corrosion control techniques.
- Realize the need of green practices inenergy storage devices.
- Identify the instruments for chemical analysis.
- Gain knowledge on polymers in electronics and its applications.

TEXT BOOKS:

1. Jain P.C. and Monica Jain, “Engineering Chemistry”, DhanpatRai Publishing Company (P) Ltd, New Delhi, 2002.
2. Dr.Sunita Rattan, “A Textbook of Engineering Chemistry” S.K.Kataria& Sons., New Delhi,2013.

REFERENCES:

1. Derek Pletcher and Frank C. Walsh, “Industrial Electrochemistry”, Chapman and Hall, New York, 1993.
2. Peter Grundler, “ Chemical Sensors – An introduction for Scientists and Engineers”, Springer, New York, 2007.
3. ArnostReiser, “Photoreactive Polymers the Science and Technology of Resists”, Wiley Interscience, New York,1989.
4. Paul T. Anastas, John C. Warner, ‘Green Chemistry: Theory and Practice’, Oxford University Press, (2000).

15UCS107	COMPUTER PROGRAMMING (Common to ALL Branches)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

- To impart the concepts in basic organization of computers and problem solving techniques.
- To familiarize the programming constructs of C.
- To explain the concepts of arrays, strings, functions, pointers, structures and unions in C.

UNIT I INTRODUCTION 8

Generation and Classification of Computers - Basic Organization of a Computer – Problem formulation – Problem Solving - Need for logical analysis and thinking – Algorithm – Pseudo code – Flow Chart.

UNIT II C PROGRAMMING BASICS 9

Introduction to ' C' programming – fundamentals – structure of a 'C' program – compilation and linking processes – Constants, Variables – Data Types – Expressions using operators in 'C' – Managing Input and Output operations.

UNIT III DECISION MAKING AND LOOPING STATEMENTS 10

if - if-else - nested if-else – else-if ladder statement – switch – goto – for- while – do-while – break – continue statements – Problem solving with decision making and looping statements.

UNIT IV ARRAYS, STRINGS AND FUNCTIONS 9

Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays - String - String operations – string arrays - Function – definition of function – Declaration of function – Parameter passing methods – Recursion - Storage classes – Problem solving with arrays, strings and functions.

UNIT V POINTERS, STRUCTURES AND UNIONS 9

Pointers - Definition – Initialization – Pointers arithmetic – Pointers and arrays - Dynamic Memory allocation – Structure - need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Pre-processor directives.

TOTAL: 45Periods

COURSE OUTCOMES:

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

- Illustrate the basics about computer.
- Develop simple programs.
- Develop simple programs using branching and looping constructs.
- Write C program using arrays, strings and functions.

- Write C programs for simple applications.

TEXT BOOKS :

1. Balagurusamy, E, “Programming in AnsiC”,Third Edition, Tats McGraw-Hill Publishing Company Limited, New Delhi, 2005.
2. PradipDey, ManasGhosh, “Fundamentals of Computing and Programming in C”, Oxford University Press, First Edition, 2009.
3. Behrouz A. Forouzan, Richard F.Gilberg, “A Structured Programming Approach using C”, Third Edition, Thomson Course Technology, 2007.

REFERENCE BOOKS :

1. Yashavant P. Kanetkar. “ Let Us C”, BPB Publications, 2011.
2. Kernighan.B.W ,Ritchie.D.M, “The C Programming language”, Pearson Education,Second Edition, 2006.
3. Stephen G.Kochan, “Programming in C”, Pearson Education India,Third Edition, 2005.
4. Anita Goel ,Ajay Mittal, ” Computer Fundamentals and Programming in C””, Dorling Kindersley (India) Pvt. Ltd, Pearson Education in South Asia, 2011.
5. Byron S Gottfried, ” Programming with C ”, Schaum’s Outlines, Tata McGraw-Hill,Second Edition, 2006.

COMPUTER PROGRAMMING LABORATORY

15UCS109	L	T	P	C
(Common to ALL Branches)				
	0	**0**	**2**	**1**

COURSE OBJECTIVES :

- To make the students to work with Office software.
- To familiarize the implementation of programs in C.

LIST OF EXPERIMENTS

a) **Word Processing**

Document creation, Formatting, Table Creation, Mail merge

b) **Spread Sheet**

Chart - Line, XY, Bar and Pie, Formula - formula editor.

c) **C Programming**

- Programs using simple statements
- Programs using decision making statements
- Programs using looping statements
- Programs using one dimensional and two dimensional arrays
- Solving problems using string functions
- Programs using user defined functions and recursive functions
- Programs using pointers
- Programs using structures and unions

TOTAL: 30Periods

COURSE OUTCOMES:

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

- Create the document in Word Processing software.
- Write programs using control constructs.
- Apply functions to reduce redundancy.
- Design and implement C programs for simple applications.

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

HARDWARE

LAN SYSTEM WITH 30 NODES (OR) STANDALONE PCS – 30 NOS.

SOFTWARE

OS – UNIX CLONE **(License free Linux)**

APPLICATION PACKAGE – OFFICE SUITE

COMPILER – C

ENGINEERING GRAPHICS

15UME108	(COMMON TO ALL BRANCHES)	L	T	P	C
		3	2	0	4

PRE-REQUISITES:

COURSE OBJECTIVE:

- To develop in students graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings
- To impart knowledge in development of surfaces, isometric and perspective projection

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION) **1**

Importance of Graphics in Engineering Applications – Use of Drafting Instruments – BIS Conventions and Specifications – Size, Layout and Folding of Drawing Sheets – Lettering and Dimensioning.

UNIT I **PLANE CURVES, PROJECTION OF POINTS, LINES AND PLANE SURFACES** **9+5**

Plane Curves: (Not for Examination)

Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of squad and circle – Drawing of tangents and normal to the above curves.

Projections:

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT II **PROJECTION OF SOLIDS** **9+6**

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to Horizontal plane (HP) only.

UNIT III **SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES** **9+6**

Sectioning of above solids in simple vertical position by cutting planes inclined to Horizontal plane (HP) and perpendicular to the VP – Obtaining true shape of section.

Development of lateral surfaces of simple and truncated solids inclined to Horizontal plane (HP) only – Prisms, pyramids, cylinders and cones.

UNIT IV ISOMETRIC AND PERSPECTIVE PROJECTIONS 9+6

Isometric Projections

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones when cutting plane inclined to Horizontal plane (HP) only.

Perspective Projections (Not for Examination)

Perspective projection of prisms, pyramids and cylinders by visual ray method.

UNIT V ORTHOGRAPHIC PROJECTION 9+6

Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills of multiple views from pictorial views of objects.

TOTAL: 45(L) + 30 (T) = 75 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to

- Discuss first angle projection to project straight line, planes and solids.
- Illustrate simple solids like prisms, pyramids, cylinder and cone.
- Construct section of solids and development of surfaces for engineering applications.
- Prepare isometric views of objects like truncated solids and frustums.
- Prepare orthographic views from isometric drawings.

TEXT BOOKS:

1. SeeniKannan P.,PitchayyaPillai G., and ArunBalasubramanian K., “Engineering Graphics Little Moon Publication, Revised edition 2016.
2. Bhatt N.D., “Engineering Drawing”, 46th Edition, Charotar Publishing House, (2003).

REFERENCE BOOKS:

1. Natarajan K.V., “A Text book opf Engineering Graphics”, Dhanalakshmi Publishers, (2006).
2. VenugopalK., and Prabhu Raja V., “Engineering Graphics”, New Age International (P) Limited (2008).
3. Gopalakrishnan K.R., “Engineering Drawing” (Vol .I&II), Subhas Publications,(1998).
   DhananjayA.Jolhe, “Engineering Drawing with an introduction to Auto CAD”,
   Tata McGraw Hill Publishing Company Limited, (2008).

ENGINEERING FUNDAMENTALS LABORATORY

15UCS111	L	T	P	C
(Common to CSE, ECE & IT)				
	0	**0**	**2**	**1**

COURSE OBJECTIVES :

- To demonstrate the hardware components of a computer.
- To train the students to assemblethe hardware components of a computer.
- To train the students to install software.
- To demonstrate residential house wiring, fluorescent lamp wiring, measurement of earth resistance, color coding of resistors, logic gates and soldering.

LIST OF EXPERIMENTS

GROUP A (COMPUTER)

I)COMPUTER ENGINEERING PRACTICE **15**

a) Demonstration on basic Hardware Components of Computer
b) Assembling of Hardware Components of Computer
c) Installation of Operating Systems (Windows Xp, Windows 7)
d) Installation of Drivers for Windows Xp
e) Installation of Application software
f) Installation of Anti Virus Software
g) Preventive maintenance of a PC
h) Install and configure network interface card in LAN system

GROUP B (ELECTRICAL & ELECTRONICS)

II)ELECTRICAL ENGINEERING PRACTICE **7**

(a) Residential house wiring using switches, fuse, indicator, lamp and energy meter and Stair case wiring
(b) Fluorescent lamp wiring.
(c) Measurement of resistance to earth of electrical equipment.

III) ELECTRONICS ENGINEERING PRACTICE **8**

(a) Study of Electronic components and equipments – Resistor, color coding measurement of AC Signal parameter (peak-peak, rms, period, frequency) using CRO.
(b) Study of logic gates AND, OR, EX-OR and NOT Gate.
(c) Soldering practice – Components, Devices and Circuits – Using general purpose PCB.

TOTAL: 30Periods

COURSE OUTCOMES:

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

- Identify the Hardware Components of Computer.
- Perform installation of software.
- Demonstrate the basic network settings.
- Execute the basic wiring, soldering etc.

- Solve the problems that are encountered in basic engineering work.

EQUIPMENTREQUIREMENTS

ELECTRICAL ENGINEERING

Sl. No.	Nameoftheequipment/software	QuantityRequired
1	Assorted electrical components for housewiring	15sets
2	Electricalmeasuringinstruments	10sets
3	Megger(250V/500V)	1No.
4	Study purpose items: Iron box, fan andregulator,emergencylamp	Oneeach
5	PowerTools: (a)RangeFinder	2No.

ELECTRONICS ENGINEERING

Sl. No.	Nameoftheequipment/software	QuantityRequired
1	Logictrainerkit	2
2	CRO,AFO	2each
3	SmallmultipurposePCBs	10No.
4	Solderingguns	10
5	Multimeters	5No.
6	Assorted electronic components for makingcircuits	Requiredquantity

HARDWARE COMPONENTS

MOTHER BOARD, RAM, ETHERNET CARD, CMOS BATTERY, SMPS, PROCESSOR, WIFI CARD, LAN CABLES,

SOFTWARE

OS – WINDOWS XP, WINDOWS 7
DRIVER SOFTWARES (ANY)
APPLICATION PACKAGE (ANY)

15UGS112 BASIC SCIENCES LABORATORY I

L	T	P	C
0	0	2	1

PHYSICS LABORATORY

(Common to All Branches)

COURSE OBJECTIVE:

- To create scientific Temper among the students.
- To know how to execute experiments properly, presentation of observations and arrival of conclusions.
- To view and realize the theoretical knowledge acquired by the students through experiments

LIST OF EXPERIMENTS:

1. Laser – Determination of particle size and wavelength of Laser source. using Diode Laser.
2. Ultrasonic Interferometer - Determination of velocity of sound and compressibility of liquid.
3. Poiseuille's method - Determination of Coefficient of viscosity of liquid.
4. Spectrometer – Determination of dispersive power of a prism.
5. Compound pendulum – Determination of the acceleration due to gravity
6. Air Wedge method - Determination of thickness of a thin wire.

- **A minimum of FIVE experiments shall be offered**

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student shall be able to

- Determine the thickness of various micro level objects using air wedge method.
- Analyze the viscous properties of various liquids using Poiseuille's method.
- Compare the velocity of ultrasonic waves in various liquids by ultrasonic interferometer method.

CHEMISTRY LABORATORY

COURSE OBJECTIVE:

- To impart knowledge on basic concepts in application of chemical analysis
- Train the students to handle various instruments.
- To acquire knowledge on the chemical analysis of various metal ions.

LIST OF EXPERIMENTS:

(Common to ECE,EEE,EIE,CSE.IT, & Biomedical Engg)

1. Preparation of molar and normal solutions of the following substances – Oxalic acid , Sodium Carbonate, Sodium Hydroxide and Hydrochloric acid
2. Conductometric Titration of strong acid with strong base
3. Estimation of Iron by potentiometer
4. Determination of Strength of given acid using pH metry
5. Determination of molecular weight of polymer by viscometry
6. Comparisonof the electrical conductivity of two samples-conducto metric method
7. Estimation of copper in brass by EDTA method

Course Outcomes

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

- Estimate the ions present in the given sample
- Determine the rate of corrosion, molecular weight and amount of solids in water
- Asses the water quality parameters

A minimum of FIVE experiments shall be offered for every course

TOTAL: 30 PERIODS

Semester II

Course Code	Course Title	L	T	P	C
THEORY					
15UEN201	Business English and Presentation Skills (Common to ALL)	3	0	0	3
15UMA202	Engineering Mathematics – II (Common to ALL)	3	2	0	4
15UPH205	Semiconductor Physics and OPTO Electronics (Common to CSE, ECE and IT)	3	0	0	3
15UCY207	Environmental Science (Common to ALL)	3	0	0	3
15UCS208	Digital Principles and System design (Common to CSE and IT)	3	0	0	3
15UIT209	Problem Solving and Programming Techniques	3	0	0	3
PRACTICAL					
15UGS210	Basic Sciences Laboratory II (Common to ALL)	0	0	2	1
15UIT211	Programming Techniques Laboratory	0	0	2	1
	TOTAL	**18**	**2**	**4**	**21**
Total No. of Credits – 21					

15UEN201	BUSINESS ENGLISH & PRESENTATION SKILLS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To use linguistic tools confidently in an English speaking context
- To listen and speak during normal business activities such as interviews, meetings, telephone conversations and negotiations.
- To write business letters, emails, reports, articles and comprehend information on the Internet and other media.
- To gain language skills for real business life situations

UNIT I **9**

Grammar- Numerical Adjective; **Vocabulary** - Job title and describing jobs; **Listening** - Listening to company culture; **Reading** - Quiz; **Writing** - Writing formal and semi formal business letters; **Speaking** – Personal information, Companies and products

UNIT II **9**

Grammar –Modals; **Vocabulary –** Collocations; **Listening** - Business Proceedings; **Reading** - Designing websites and e– mail ; **Writing** – Memo -**Speaking -** Role play on various business situation.

UNIT III **9**

Grammar– prepositions – Articles; **Vocabulary –**Jargons related to Shares and stock; **Listening** – Interviews of celebrities; **Reading –** Shares and stock exchange transactions; **Writing** – Business report – Minutes of the Meeting; **Speaking** – Presentations, Making a business talk.

UNIT IV **9**

Grammar - Connectives; **Vocabulary**–Words related to finance; **Listening** - Listening to statistical information; **Reading** - Interpreting business related bar charts; **Writing** - Letters to express interest in new products; **Speaking** - Presenting a summary of an article.

UNIT V **9**

Grammar - Reported speech; **Vocabulary** – Words related to employment ; **Listening**-Listening to audio and video speech of business people; **Reading** - Reading News paper article/magazine articles on business; **Writing** - Writing a Proposal; **Speaking** - Discussing company policies.

TOTAL: 45(L) = 45PERIODS

COURSE OUTCOMES:

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

- Use business vocabulary effectively to present the ideas.
- Accomplish verbal and written communications.
- Write effectively in a wide range of business letters.
- Prepare Business Proposals and Business Reports for various business purposes.
- Make a presentation in English in various business avenues.

TEXT BOOK:

1. M.Dhanasekaran: Business English & Presentation Skills, Rathna Arts,Sivakasi, 2018.

REFERENCE BOOKS:

1. B.A.Elankathiravan: Business English & Presentation Skills,Wakeup Publication, Sivakasi,2017
2. Allan Pease, Body Language, New Delhi,Sudha Publications(P) Ltd,2005.
3. Malcolm Goodale, Professional Presentations,New Delhi,CambridgeUniversity Press,2006.
4. Randolph Hudson.H &Bernard Selzler.J.Business Communication,Jaico Publishing House,2006

	ENGINEERING MATHEMATICS – II	L	T	P	C
15UMA202	(Common to ALL Branches)	3	2	0	4

OBJECTIVES :

- To develop an understanding of the basics of vector calculus comprising of gradient, divergence and curl, and line, surface and volume integrals and the classical theorems involving them.
- To acquaint the student with the concepts of analytic functions and their interesting properties which could be exploited in a few engineering areas, and be introduced to the host of conformal mappings with a few standard examples that have direct application.
- To make the student acquire sound knowledge of Laplace transform and its properties and sufficient exposure to the solution of certain linear differential equations using the Laplace transform technique.

UNIT I ANALYTICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS 8 + 6

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Applications of ODE (Bacterial growth, Population growth, Decayed problems).

UNIT II VECTOR CALCULUS 8 + 6

Gradient Divergence and Curl – Directional derivative – Irrotational and Solenoidal vector fields – Vector integration – Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelopiped.

UNIT III ANALYTIC FUNCTIONS 8 + 6

Functions of a complex variable – Analytic function – Necessary and Sufficient Conditions (excluding Proofs) – Harmonic function - Properties of an analytic function – Harmonic conjugate – Construction

of analytic functions – Conformal mapping: w = z+c, cz, 1/z, and Bilinear transformation.

UNIT IV COMPLEX INTEGRATION 9 + 6

Statement and applications of Cauchy's integral theorem, Cauchy's integral formula and Cauchy Residue Theorem – Taylor's and Laurent's expansions – Applications of residue theorem to evaluate real integrals – Unit circle and semi-circular contour (excluding Poles on the real axis).

UNIT V LAPLACE TRANSFORM 9 + 6

Existence conditions – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function, impulse function andperiodic function - Inverse Laplace transform – Convolution theorem (excluding Proof) –Solution of linear ODE of second order with constant coefficients.

SUPPLEMENT TOPIC (for internal evaluation only) 3

Evocation / Application of Mathematics, Arithmetical, Ability – Time and Work – Time and Distance.

TOTAL : 45 (L) + 30 (T) = 75 Periods

COURSE OUTCOMES:

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

- Solve first and higher order ordinary differential equations analytically and apply in real life engineering problems.
- Calculate the gradients and directional derivatives of functions of several variables.
- Find the image of a region under conformal mapping and construct analytic functions using its properties.
- Apply the knowledge of standard techniques of complex variables for evaluating different functions
- Apply Laplace Transform methods to solve initial value problems for constant coefficient linear ODEs.

TEXT BOOKS:

1. VEERARAJAN.T “Engineering Mathematics” Tata McGraw Hill Publishing Company, New Delhi, vol 15.
2. BALI N. P and MANISH GOYAL, “Text book of Engineering Mathematics”, Laxmi Publications (P) Ltd., New Delhi, 3rd Edition, (2008).

REFERENCE BOOKS:

1. RAMANA B.V, “Higher Engineering Mathematics”, Tata McGraw Hill Publishing Company, New Delhi, 11th Reprint, (2010).
2. KREYSZIG. E, “Advanced Engineering Mathematics”, John Wiley & Sons, New York, 10th Edition, (2011).
3. JAIN R.K and IYENGAR S.R.K, “Advanced Engineering Mathematics”, Narosa Publishing House Pvt. Ltd., New Delhi, 3rd Edition, (2007).
4. AGARWAL R.S., “Quantitative Aptitude”, S. Chand Publications, New Delhi, 7th Edition, (2008), pp. 341-370, 384-404.
5. GREWAL. B.S,“Higher Engineering Mathematics”, Khanna Publications, New Delhi, 43rd Edition, (2014).

15UPH205	SEMICONDUCTOR PHYSICS AND OPTO ELECTRONICS (COMMON TO ECE, CSE & IT BRANCHES)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the essential principles of physics for information science and related Engineering applications.
- To demonstrate the concepts of conduction in conductors.
- To apply fundamental knowledge in the area of fiber optics.
- To enable the students to understand the dielectric and superconducting materials.

UNIT I CONDUCTING MATERIALS 9

Conductors – classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory – Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – carrier concentration in metals.

UNIT II TRANSPORT PROPERTIES OF SEMICONUCTORS AND MAGNETIC MATERIALS 9

Introduction- Types of semiconductor –Electron and hole concentration (Qualitative)-Intrinsic Carrier Concentration–Expression for electrical conductivity of a semiconductor- Hall effect-Origin of magnetic moment – Bohr magnetron – comparison of Dia, Para and Ferro magnetism – Domain theory – Hysteresis – soft and hard magnetic materials .

UNIT III DIELECTRICS AND SUPERCONDUCTION MATERIALS 9

Introduction- Types of polarization -Local or Internal field- Types of Dielectric Materials- Applications- Introduction of superconductors- Properties- Types of superconductors- High temperature superconductors- Applications of superconductors– SQUID – Maglev train.

UNIT IV OPTOELECTRONICS 9

Introduction -Modulations- Pulse code modulation- Franz keldysh and stark effect –Electro absorption modulators- Optical switching- Bipolar controller- Applications of Bipolar controller.

UNIT V FIBRE OPTICS 9

Introduction- Principle and propagation of optical fibres - Types of optical fibre- Losses in fibres- Advantages of opicalfibre- Fibre optic communication systems (Block diagram)- Splicing- Fusion and Mechanical splicing- Fibre optic sensors –Temperature and pressure sensor.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Summarize the structure, properties, performance, and processing of conductors to solve engineering problems.
- Understand how semiconducting and magnetic materials are influencing engineering design.
- Discuss the various polarization mechanisms in dielectrics.
- Familiarize with the basics of optoelectronic materials and their applications.
- Outline the principle of Fibre optical communication.

TEXT BOOKS:

1. William D. Callister, Jr. “Material Science and Engineering”, Seventh Edition, John Wiley & Sons Inc. New Delhi, 2010
2. Dr. Mani.P, “Engineering Physics II ”, Dhanam Publications, Edition ,2014, Chennai
3. Rajendran.V, “Engineering,Physics”, Tata Mc-Graw Hill Publishing Company limited, New Delhi, Revised Edition 2013.

REFERENCE BOOKS:

1. Raghuvenshi G.S., “Engineering Physics”, PHI Learning Private Limited, New Delhi, Revised Edition 2014.
2. Arul doss .G., “Engineering Physics”, PHI Learning Limited, New Delhi, Revised Edition 2013.
3. Marikani .A., “Engineering Physics”, PHI Learning Private Limited, New Delhi, Revised Edition 2012.
4. Sankar B.N., and Pillai .S.O., “Engineering Physics – I”, New Age International Publishers Private Limited, New Delhi, Revised Edition 2015.

15UCY207	ENVIRONMENTAL SCIENCE (COMMON TO ALL BRANCHES)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Understanding the concepts of ecosystem and biodiversity.
- Acquire knowledge about the impact of environmental pollution.
- Awareness on various types of resources.
- Understand the importance of environmental issues in the soceity.
- Awareness about the impact of environment related to human health .

MODULE I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 10

Definition, scope and importance of environment – Need for public awareness – Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity – Definition: genetic, species and ecosystem diversity – Biogeographical classification of India – Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

MODULE II ENVIRONMENTAL POLLUTION 9

Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Solid waste management: Causes, effects and control measures of municipal solid wastes – Role of an individual in prevention of pollution – Pollution case studies - Disaster management : floods, earthquake, cyclone and landslides.

MODULE III FUTURE POLICY AND ALTERNATIVES 9

Future policy and alternatives-fossil fuels-nuclear energy-solar energy-wind energy-hydroelectric energy-geothermal energy-tidal energy-sustainability-green power-nanotechnology-international policy.

MODULE IV SOCIAL ISSUES AND THE ENVIRONMENT 9

From unsustainable to sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization - Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – Wasteland reclamation – Consumerism and waste products – Environment protection act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation – Public awareness.

MODULE V HUMAN POPULATION AND THE ENVIRONMENT 8

Population growth, variation among nations – Population explosion – Family welfare programme – Environment and human health – Human rights – Value education – HIV / AIDS – Women and child welfare – Role of information technology in environment and human health

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of this course the student will be able to:

- Comprehend the importance of environmental impact on ecosystem and biodiversity
- Understand current environmental challenges like pollution and its management.
- Remembering the fundamentals of physical and biological principles that govern natural processes.
- Perform their role in protecting the environment from social issues.
- Learn the importance of population explosion and its controlling measures.

TEXT BOOKS

1. AnubhaKaushik, kaushik C.P., “Environmental Science and Engineering”, Third Edition, New Age International, New Delhi, 2009.
2. Benny Joseph “Environmental Science and Engineering”, Tata Mc-Graw Hill, New Delhi, 2006.

REFERENCE BOOKS:

1. Gilbert M.Masters, ‘Introduction to Environmental Engineering and Science’, Pearson Education,Upper saddle River, New Jersey, 2008.
2. Miller T.G. Jr., Environmental Science”, Wadsworth Publishing Company, Belmont, California, 2005.
3. De A.K., “Environmental Chemistry”, Wiley Eastern Ltd., New Delhi, 2001.
4. Trivedi R.K., Goel P.K., “Introduction to Air Pollution”, Techno-Science Publication, Jaipur, 2005.

DIGITAL PRINCIPLES AND SYSTEM DESIGN

15UCS208	L	T	P	C
(Common to CSE & IT)				
	3	**0**	**0**	**3**

COURSE OBJECTIVES:

- To familiarize the concepts of various number systems, Boolean algebra and various logic gates.
- To explain the concepts in designing and analyzing various combinational and sequential circuits.
- To impart the knowledge about the programmable memory logics.

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 8

Review of Number Systems – Arithmetic Operations – Binary Codes – Boolean Algebra and Theorems – Boolean Functions – Simplification of Boolean Functions using Karnaugh Map and Tabulation Methods – Logic Gates – NAND and NOR Implementations.

UNIT II COMBINATIONAL LOGIC 10

Combinational Circuits – Analysis and Design Procedures – Circuits for Arithmetic Operations- Binary Adder, Binary Subtractor, Binary Multiplier , BCD Adder, Serial Adder / Subtractor , Parallel Adder / Subtractor ,Magnitude Comparator- Code Conversion – binary to gray, gray to binary, BCD to excess 3 code - Introduction to Hardware Description Language(HDL).

UNIT III DESIGN WITH MSI DEVICES 8

Decoders and encoders - Multiplexers and De Multiplexers - Memory and programmable logic - Implementation of combinational logic using ROM, PAL and PLA.

UNIT IV SYNCHRONOUS SEQUENTIAL LOGIC 10

Sequential Circuits – Flip Flops – Analysis and Design Procedures – State Reduction and State Assignment – Shift Registers – Counters:Synchronous - Up, Down and Up/Down, Asynchronous - Up, Down and Up/Down.

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC 9

Types of Asynchronous Sequential Circuits - Analysis and Design of Fundamental Mode Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards.

TOTAL: 45Periods

COURSE OUTCOMES:

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

- Apply simplification techniques to implement Boolean expression.
- Illustrate the design of combinational circuits for arithmetic operations and code conversions.
- Design memory devices using MSI.
- Analyze and design synchronous sequential digital circuits.
- Minimize the states and flow tables in designing asynchronous sequential circuits.

TEXT BOOKS:

1. Morris Mano M, Michael D. Ciletti, “Digital Design”, IV Edition, Pearson Education, 2008.
2. John F. Wakerly, “Digital Design Principles and Practices”, Fourth Edition, Pearson Education, 2007.

REFERENCE BOOKS:

1. AtulP.Godse and DeepaliA.Godse, “Digital Principles and System Design”, First Edition,Technical Publication, 2014.
2. S. Salivahanan and S. Arivazhagan, ‘Digital Circuits and Design’, 3rdedition, Vikas Publishing House Pvt. Ltd, New Delhi.
3. Charles H. Roth Jr, “Fundamentals of Logic Design”, Fifth Edition – Jaico Publishing House,Mumbai, 2003.
4. Kharate G. K., “Digital Electronics”, Oxford University Press, 2010.

15UIT209 PROBLEM SOLVING AND PROGRAMMINGTECHNIQUES

L	T	P	C
3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To explain the basic concepts of programming Paradigms
- To Summarize the Various Storage Classes
- To impart Knowledge in input and Output
- To demonstrate the systematic way of solving problems

UNIT I FUNCTIONS AND PROGRAM STRUCTURE **9**

Program Structure and Functions – Basic of Functions – External Variables – Scope Variables – Register Variables – Block Structure – Initialization – Recursion – C Pre Processor.

UNIT II STORAGE MANAGEMENT **9**

Storage Classes – Storage Class Specifier – Structures – Basics of Structures – Structures and Functions – Array of Structures – Pointers to Structures

UNIT III POINTERS AND ARRAYS **9**

Pointers and Addresses – Pointers and Function Arguments – Pointers and Arrays – Character Pointers and Functions – Pointer Arrays – Pointers to Pointers – Pointers Functions

UNIT IV INPUT AND OUTPUT **9**

Standard Input and Output – Formatted Output – Formatted Input – File Access – Miscellaneous Functions – String Operations – File Descriptors – File handling Operations – Random Access – Command Line Arguments

UNIT V SORTING AND SEARCHING **9**

Sorting – Bubble Sort – Selection Sort – Quick Sort – Merge Sort – Insertion Sort – Heap sort – Searching – Sequential Search and Binary Search.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Apply the Knowledge of fundamental programming concepts in developing functions, to solve simple problems.
- Apply the knowledge in various storage classes and structures to develop solutions.
- Apply the knowledge of pointers and Arrays to develop solutions.
- Apply the knowledge in file handling techniques to store and retrieve data.
- Identify, formulate and analyze searching & sorting techniques.

TEXT BOOK:

1. Bian W Kernighan, Dennis M Ritchie ". The C Programming Language", HASS, Second Edition.
2. Weiss.M.A, "Data Structures and Algorithm Analysis in C", BPB Publications, 13th Edition, 2013.
3. Aho .V. Hopcroft.J.E, Ullman.J.D., "Data Structures and Algorithms", Pearson Education, First Edition, Reprint, 2003.
4. Balagurusamy E., "Computing Fundamentals and C Programming", Tata McGraw- Hill Publishing Company Limited, 2008.

REFERENCE BOOK

1. YashavantKanetkar, "Understanding Pointers in C", BPB Publications, 2007.
2. YashavantKanetkar, "Let Us C", BPB Publications, 13th Edition, 2013.
3. Aho .V. Hopcroft.J.E, Ullman.J.D., "Data Structures and Algorithms", Pearson Education, First Edition, Reprint, 2003.
4. Balagurusamy E., "Computing Fundamentals and C Programming", Tata McGraw- Hill Publishing Company Limited, 2008.

15UGS210 BASIC SCIENCES LABORATORY – II L T P C

0 02 1

PHYSICS LABORATORY

(COMMON TO CSE, ECE, EEE, IT, BIOMEDICAL)

COURSE OBJECTIVE:

- To introduce the experimental procedure for the Band gap of a semiconductor, B-H curve and Potentiometer.
- To demonstrate the working of Spectrometer and Lee's Disc apparatus.

LIST OF EXPERIMENTS

1. Laser – Determination of numerical aperture and acceptance angle of an optical fibre.
2. Carey Foster's Bridge – Determination of specific resistance of the given coil.
3. Spectrometer – Determination of wavelength of mercury source using grating.
4. Newton's ring – Determination of radius of curvature of Planoconvex lens.
5. B-H curve - Study of Hysteresis Loop
6. Determination of Band gap of a semiconductor.

- **A minimum of FIVE experiments shall be offered**

COURSE OUTCOMES:

After the successful completion of this course, student shall be able to

- Analyze the thermal conductivities of bad conductors and also the properties of semiconductors.
- To know the elastic properties of materials using uniform & non-uniform bending method of young's modulus.
- Understand the theory behind the signal communication through laser in optical fiber.

CHEMISTRY LABORATORY

COURSE OBJECTIVE:

- Apply the theoretical concepts to perform lab experiments.
- To assess the water quality parameters.
- To acquire knowledge on water quality parameters for the analysis of industrial effluents.

LIST OF EXPERIMENTS

(Common to All Branches)

- Estimation of hardness of water by EDTA method.
- Estimation of alkalinity of water sample.
- Estimation of Chloride in water sample (Argentometric method)
- Determination of DO in water
- Estimation of silver ion by Dichrometry
- Determination of quality of Surface water (River/pond/lake) and Ground water (well/

- bore well) with respect to Hardness, TDS, Chloride and pH.
- Determination of acidity of industrial effluents.

COURSE OUTCOMES:

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

- Analyze the properties of water by applying the chemical concepts.
- Determine the amount of acid in the industrial effluents.
- Use specific methods to analyze the Dissolved oxygen in water.

A minimum of FIVE experiments shall be offered

TOTAL: 30 PERIODS

15UIT211 PROGRAMMING TECHNIQUES LABORATORY L T P C
0 0 2 1

COURSE OBJECTIVESS:

- To demonstrate the systematic way of solving problems using C.

LIST OF EXPERIMENTS:

1. Implement Function Using Scope Variables
2. Implement Recursions
3. Implement the Concept of C Pre Processor
4. Implements Programs Using Structure
5. Implements Programs Using Structure Pointers
6. Implements Programs Using Array of Structure
7. Implements Programs Using Pointers to Structures
8. Implements Programs Using Pointers and Functions
9. Implements Programs Using Pointers to Pointers
10. Implements Programs Using Sequential File Operations
11. Implements Programs Using Random File Operations
12. Implements Programs Using Command Line Arguments
13. Implements Bubble Sort, Insertion Sort and Selection Sort
14. Implement Quick Sort, Merge Sort and Heap Sort
15. Implement Programs Using Searching Techniques.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

- Apply the knowledge in function, recursion and preprocessor to solve the suitable applications
- Apply the knowledge in types of structure to solve record processing applications
- Apply the knowledge in dynamic memory allocation to solve application using pointers
- Apply the knowledge in types of files to solve file handling applications
- Identify, analyze and resolve the issue in arranging data using various types of sorting and searching techniques.

HARDWARE AND SOFTWARE REQUIREMENTS

Computer required: 30 no's

Minimum requirements: Processor: Pentium IV, Ram: 1GB, Hard Disk: 80GB

Software Requirements:

Linux (Ubuntu/Fedoral/Debian/Mintos)/ windows
Turbo C version 3

Semester III

Course Code	Course Title	L	T	P	C
THEORY					
15UMA322	Probability Statistics and Queueing Systems (Common to CSE and IT)	3	2	0	4
15UIT302	Data Structures and Algorithms	3	0	0	3
15UCS303	Computer Organization and Architecture (Common to CSE and IT)	2	2	0	3
15UIT304	Object Oriented Programming	3	0	0	3
15UIT305	Operating systems (Common to CSE and IT)	3	0	0	3
15UIT306	Analog and Digital Communication	3	0	0	3
PRACTICAL					
15UIT307	Object Oriented Programming Laboratory	0	0	2	1
15UIT308	Data Structures and Algorithms Laboratory	0	0	2	1
15UIT309	Operating Systems Laboratory (Common to CSE and IT)	0	0	2	1
	TOTAL	**17**	**4**	**6**	**22**
Total No. of Credits – 22					

		L	T	P	C
15UMA322	**PROBABILITY, STATISTICS & QUEUEING THEORY (Common to CSE & IT)**	**3**	**2**	**0**	**4**

OBJECTIVES :

- To make the student acquire sound knowledge of standard distributions that can describe real life phenomena.
- To acquire skills in handling situations involving more than one random variable and functions of random variables.
- To provide the basic characteristic features of a queuing system and develop the skills in analyzing queuing models.

UNIT I PROBABILITY & STATISTICAL DISTRIBUTIONS 9 + 6

Axioms of probability - Conditional probability - Total probability - Baye's theorem – Discrete and continuous random variables - Moments - Moment generating functions and their properties. Binomial, Poisson, Normal, Geometric, Uniform, Exponential and Gamma distributions.

UNIT II TWO DIMENSIONAL RANDOM VARIABLES 9 + 6

Joint probability distributions - Marginal and Conditional distributions – Covariance - Correlation and Regression - Transformation of random variables - Central limit theorem.

UNIT III DESIGN OF EXPERIMENTS 9 + 6

Completely Randomized Design – Randomized Block Design – Latin Square Design.

UNIT IV QUEUEING THEORY 9 + 6

Definitions – Basic terms of Queueing theory - Markovian models – Birth and Death Queuing models - Steady state results: Single and multiple server queuing models - Little's Formula - Queues with finite waiting rooms - Finite source models.

UNIT V NON-MARKOVIAN QUEUES AND QUEUE NETWORKS 9 + 6

M/G/1 Queue - Pollaczek- Khintchine formula. Series Queues - Open and Closed Jackson networks.

TOTAL : 45 (L) + 30 (T) = 75 Periods

COURSE OUTCOMES:

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

- Apply the acquired knowledge of standard distributions in real life phenomena.
- Find the relationship involving more than one random variable and analyze the functions.
- Design and analyze a process, to evaluate which process inputs have a significant impact on the process output using design of experiments.
- Study the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
- Apply basic probability techniques and models to analyze the performance of systems.

TEXT BOOKS:

1. OLIVER C. IBE, "Fundamentals of Applied probability and Random processes", Elsevier, Lowell, Massachusetts, first Indian Reprint (2007).
2. GROSS D, and HARRIS C.M., "Fundamentals of Queuing Theory", Wiley Students, India, 3rd Edition, (2004).
3. Dr.J.Ravichandran ,"Probability and Statistics for Engineers" Wiley New delhi-2 first 2010 (Regulation 2015)
4. Richard .K.Williams ,"Probability, Statistics and Random Process for Engineers", Cengage Learning , New Delhi-2 , first Indian Reprint (2009).
5. Williams Menden kall, Robert J.Beaver , BarabaraM.Beaver "Probability Statistics", college learning 2013 14th Edison **,** New Delhi

REFERENCE BOOKS:

1. VEERARAJAN T. "Probability, Statistics and Random Process", Tata McGraw Hill, New Delhi, 2ndEdition, (2003).
2. ALLEN.A.O, "Probability, Statistics and Queuing Theory with Computer Applications", Elsevier, New Delhi, 2nd Edition, (2005).
3. TAHA.H. A., "Operations Research-An Introduction", Pearson Education, New Delhi, 9th Edition, (2010).
4. TRIVEDI.K. S., "Probability & Statistics with Reliability, Queuing & Computer Science Applications", Prentice Hall of India, New Delhi, 2nd Edition, (2009).
5. JOHNSON R.A, and GUPTA C.B., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, New Delhi, 8thEdition, (2011).
6. VEERARAJAN T. "Probability, Statistics and Random Process with Queueing theory and Queueing Networks ", Tata McGraw Hill Education, New Delhi-6, 4thEdition, (2006).

15UIT302	DATA STRUCTURES AND ALGORITHMS	L	T	P	C
		3	0	0	3

PRE-REQUISITES: 15UIT209 PROBLEM SOLVING AND PROGRAMMING TECHNIQUES

COURSE OBJECTIVE:

- To efficiently implement the different data structures
- To learn linear data structures – list, stack, and queue.
- To be exposed to the concepts of Trees
- To learn the systematic way of solving problems
- To acquire knowledge from non-linear data structures – graph

UNIT I LINEAR STRUCTURES 10

Abstract Data Types (ADT) – List ADT – Array implementation of Lists – Linked lists - Doubly Linked Lists – Stack ADT - Applications of Stack - Queue ADT - Applications of Queue.

UNIT II TREE STRUCTURES 8

Tree ADT – Tree traversals – Applications - Binary Tree ADT – Expression tree - Binary search tree ADT.

UNIT III BALANCED TREE 9

AVL Trees – Splay Trees – B-Tree - heaps – Priority Queues- Binary heap – Applications of Priority Queues.

UNIT IV HASHING AND SET 9

Hashing – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing - Disjoint Set ADT – Dynamic Equivalence Problem – Smart Union Algorithms – Path Compression – Application of Set

UNIT V GRAPHS 9

Definitions – Topological sort – Shortest path algorithms – Minimum spanning tree – Prim's and Kruskal's algorithms – Breadth First Search – Depth First Search – Applications of DFS- Biconnectivity – Euler circuits

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

- Apply the knowledge in types of data structures to solve the related problems in relevant applications. (Apply)
- Apply the knowledge of tree data structures to find solutions to complex problems related to data search, storage and retrieval. (Apply)
- Identify the issues in balanced trees and analyze them to solve the relevant problems. (Analyze)
- Analyze hashing and set techniques for achieving reliable data search and retrieval. (Analyze)
- Apply the concept of graph data structures to solve suitable applications. (Apply)

TEXT BOOKS:

1. Weiss. M.A"Data Structures and Algorithm Analysis in C", Pearson Education, 2nd Edition, 2012
2. Aaron M.Tenenbaum, YedidyahLangsam, Moshe J.Augenstein, "Data Structures using C", Pearson Education India, 7th Edition, New Delhi, 2009.

REFERENCE BOOKS:

1. Aho.V, Hopcroft.J.E, Ullman.J.D, "Data Structures and Algorithms", Pearson Education, 1st Edition Reprint, 2006.
2. Gilberg.R.F, Forouzan.B.A, "Data Structures", Thomson India Education, 2nd Edition, 2005.
3. Sara Baase and A.VanGelder, "Computer Algorithms", Pearson Education, 3rd Edition, 2005.
4. Cormen.T.H, C.A.Leiserson.B.A, R.L.Rivest and C.Stein, "Introduction to Algorithms", Prentice Hall of India, 3rd Edition, 2009.

15UCS303	COMPUTER ORGANIZATION AND ARCHITECTURE (Common to CSE and IT)	L	T	P	C
		2	2	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To familiarize the components of computer system and Instructions.
- To discuss in detail the operation of the arithmetic unit.
- To explain the concept of pipelining and superscalar operation.
- To give knowledge on memory and I/O systems.

UNIT I OVERVIEW AND INSTRUCTIONS 10+10

Components of a computer system - Basic Operational Concepts - operations and operands – representing instructions– Logical operations – control operations – Instruction and instruction sequencing - Addressing and addressing modes

UNIT II ARITHMETIC OPERATIONS AND PIPELINING 10+10

ALU - Addition and subtraction of signed numbers – Multiplication of unsigned and signed numbers – Fast Multiplication – Integer division - Floating point numbers and operations. Pipelining – Data hazards – Instruction Hazards– Superscalar Operation.

UNIT III MEMORY AND I/O SYSTEMS 10+10

Memory hierarchy - Memory technologies – Cache basics – Measuring and improving cache performance - Virtual memory, TLBs- Memory Management Requirements - Input/output system, DMA and interrupts, Buses.

TOTAL : 30(L)+30(T)=60 Periods

COURSE OUTCOMES:

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

- Describe the instruction sets with various addressing modes.
- Solve arithmetic operations for signed and unsigned numbers.
- Explain pipelined control unit.
- Compare the performance of memory systems.

TEXT BOOKS:

1. Carl Hamacher, ZvonkoVranesic and SafwatZaky, “Computer Organization”, Fifth Edition, Tata McGraw Hill, 2002.
2. David A. Patterson and John L. Hennessey, “Computer organization and design the hardware / software interface’, Morgan Kauffman / Elsevier, Fifth edition, 2014.

REFERENCE BOOKS:

1. William Stallings “Computer Organization and Architecture” , Seventh Edition , Pearson Education, 2006.
2. Vincent P. Heuring, Harry F. Jordan, “Computer System Architecture”, Second Edition, Pearson Education, 2005.
3. Govindarajalu, “Computer Architecture and Organization, Design Principles and Applications'', first edition, Tata McGraw Hill, New Delhi, 2005.
4. John P. Hayes, “Computer Architecture and Organization”, Third Edition, Tata McGraw Hill, 1998.

15UIT304	OBJECT ORIENTED PROGRAMMING	L	T	P	C
		3	0	0	3

PRE-REQUISITES: 15UCS107 COMPUTER PROGRAMMING

COURSE OBJECTIVE:

- To understand the basic concepts of OOPs, benefits of OOPs and applications of OOPs
- To solve various problems using various OOPs features in C++
- To describe Templates for time conventional programming
- To work with File Systems and exception handlings

UNIT I INTRODUCTION 9

Object – Oriented Paradigm – Elements of Object Oriented Programming – Merits and Demerits of OO Methodology – C++ fundamentals – Data types – Operators and Expressions – Control flow – Arrays – Structures – Functions

UNIT II CLASSES AND OBJECTS 9

Classes and Objects – Passing objects as arguments – returning objects – Friend functions – Static data and member functions – Constructors – Parameterized constructor – Destructor – Copy constructor – Array of Objects – pointer to object members.

UNIT III POLYMORPHISM AND INHERITANCE 10

Polymorphism – Function overloading – Unary operator overloading – binary operator overloading – Data conversion – Overloading with Friend Functions – Inheritance – Derived class – Abstract Classes – Types of Inheritance

UNIT IV VIRTUAL FUNCTIONS AND TEMPLATES 8

Virtual functions – Need – Definition – Pure Virtual Functions – Virtual Destructors – Template – Class template – Function Template.

UNIT V FILES AND EXCEPTION HANDLING 9

C++ streams – console streams – console stream classes – formatted and unformatted console I/O operations – Manipulators File streams classes – File modes – File pointers and Manipulations – File I/O – Exception handling.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Compare the merits and demerits of object oriented programming over the structure programming
- Develop solutions to a given problems using class object concepts
- Make use of overloading and inheritance concepts to solve real world problems
- Apply virtual and template concepts in a given problem
- Experiment with C++ streams and file manipulations

TEXT BOOKS:

1. K.R. Venugopal, RajkumarBuyya, T. Ravisankar, “Mastering C++”, Tata McGraw Hill, 2nd Edition, 2013.
2. E.Balagurusamy, “Object Oriented Programming with C++”, Tata McGraw Hill, 6th Edition 2013.

REFERENCE BOOKS

1. JoshvaDevadas.T, A.Chandrababu, “A Programming with C++”, Narosa Publishing House, 1st Edition, 2009.
2. Ira Pohl, “Object Oriented Programming Using C++”, Pearson Education, 2ndEdition, Reprint, 2004.
3. Lippman. S.B, Joseelajoie, Barbara E. Moo, “C++ Primer”, Pearson Education, 4th Edition, 2008.
4. Stroustrup. B, “The C++ Programming language”, Pearson Education, 3rdEdition, 2004.

15UIT305	OPERATING SYSTEMS (Common to CSE and IT)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To have an overview of different types of operation systems
- To study about process management
- To have a thorough knowledge of deadlock and memory management
- To know file sharing and virtual memory
- To learn the basic concepts of I/O and file systems

UNIT I INTRODUCTION 9

Introduction : Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld System – Hardware Protection – System Components – Operating System Services – System Calls – System Programs – Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes

UNIT II PROCESS MANAGEMENT 9

Threads: Overview – Threading issues – CPU Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Process Synchronization: The Critical – Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

UNIT III DEADLOCK AND MEMORY MANAGEMENT 9

System Model – Deadlock Characterization – Methods for handling Deadlocks – Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks – Storage Management: Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV VIRTUAL MEMORY AND FILE SHARING INTERFACE 9

Virtual Memory: Demand Paging – Process Creation – Page Replacement –Allocation of frames – Thrashing – File System Interface: File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection.

UNIT V FILE SYSTEM STRUCTURE AND STORAGE STRUCTURE 9

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management – IO Systems – Kernel I/O Subsystems – Mass storage Structure: Disk Structure –Disk Scheduling – Disk Management – Swap-Space Management.

TOTAL: 45PERIODS

COURSE OUTCOMES:

- Apply the knowledge of operating systems structures and functions in system engineering (Apply)
- Apply the suitable algorithms for Various Problems related to Process management (Apply)
- Identify, formulate and analyze deadlock problems for better memory management techniques. (Apply)
- Analyze the possibilities of memory extensions using virtual memory in the modern computing environment. (Apply)
- Apply the knowledge of file management concepts in the design of operating systems. (Apply)

TEXT BOOKS:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts" Wiley & Sons (ASIA) Pvt. Ltd, 9th Edition, 2010.
2. D M Dhamdhere, "Operating Systems: A Concept-based Approach", Tata McGraw-Hill Education, 2nd Edition, 2007.

REFERENCE BOOKS:

1. I.A Thotre, "Operating Systems", Technical publications, 1st Edition, 2013.
2. Harvey M. Deitel, "Operating Systems", Pearson Education Pvt. Ltd, 1st Edition, 2007.
3. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India Pvt. Ltd, 3rd Edition 2007.
4. William stallings, "Operating System", Prentice Hall of India, 3rd Edition, 2008.

15UIT306	ANALOG AND DIGITAL COMMUNICATION	L	T	P	C
		3	0	0	3

PRE-REQUISITES: 15UCS208 DIGITAL PRINCIPLES AND SYSTEM DESIGN

COURSE OBJECTIVE:

- To introduce the concepts of various analog modulations and their spectral characteristics
- To know the principles of sampling & quantization
- To study the various waveform coding schemes
- To create awareness on the basic communications systems, particularly with application to noise-free analog and digital communications.

UNIT I ANALOG COMMUNICATION 9

Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, Modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation – FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves

UNIT II DIGITAL COMMUNICATION 9

Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK.

UNIT III DIGITAL TRANSMISSION 9

Introduction, Pulse modulation, PCM – PCM sampling, sampling rate, signal to quantization noise rate, companding – analog and digital – percentage error, delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission – Intersymbol interference, eye patterns.

UNIT IV SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES 9

Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications.

UNIT V ERROR CONTROL CODING 9

Error Control Coding, linear block codes, cyclic codes, convolution codes, Viterbi decoding algorithm

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of various analog modulation techniques to identify voltage and power distribution. (Apply)
- Identify, formulate and analyze various digital communication techniques to transmit digital data. (Analyze)
- Identify and apply various digital signal and broadcasting technologies using pulse code modulation. (Apply)
- Identify, formulate and analyze various multiple access techniques to provide better capacity range for communication.
- Apply the knowledge of various Error control coding techniques to control the occurrences of errors. (Apply)

TEXT BOOKS

1. Wayne Tomasi, "Advanced Electronic Communication Systems', Pearson Education, 6th Edition, 2009.
2. Simon Haykin, "Communication Systems", John Wiley & Sons, 4th Edition, 2004.

REFERENCE BOOKS

1. H. Taub, D L Schilling and G Saha, "Principles of Communication", Pearson Education, 3rd Edition, 2007.
2. Allan V.Oppenheim, S.Wilsky and S.H.Nawab, "Signals and Systems", Pearson Education, 2nd Edition, 2007.
3. B.P.Lathi, "Modern Analog and Digital Communication Systems", Oxford University Press, 2007.
4. Martin S.Roden, "Analog and Digital Communication System", Prentice Hall of India, 3rd Edition, 2002.

15UIT307 OBJECT ORIENTED PROGRAMMING LABORATORY

L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

- To demonstrate the basic concepts of Object Oriented Programming
- To demonstrate Operator overloading and exception handling concepts
- To demonstrate various file operations in C++

LIST OF EXPERIMENTS

1. Implement Simple C++ Programs
2. Implement Programs using functions
3. Implement Programs using classes
4. Implement Programs to demonstrate Constructor overloading
5. Implement Programs to demonstrate Function overloading
6. Implement Programs to demonstrate Operator overloading
7. Implement Programs to demonstrate Inheritance
8. Implement Programs to demonstrate Polymorphism and Virtual functions
9. Implement a Program for finding the minimum value contained in an array using function templates
10. Implement a Program to represent a stack and Queue data structure using class template
11. Write a program to apply File Handling and I/O Manipulation techniques for a given problem
12. Write a program to apply Exception handling methods for a given problem

TOTAL: 30 PERIODS

COURSE OUTCOMES

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

- Make use of object oriented programming concepts
- Make use of operator and function overloading in C++
- Experiment with inheritance and Polymorphism
- Develop programs using the template concepts
- Apply file and exception handling methods in a given problem

HARDWARE AND SOFTWARE REQUIRMENTS

Computer required: 30 No's

Minimum Requirement: Processor: Pentium IV, Ram: 1GB, Hard Disk: 80 GB

Software Requirements;

Operating System: Linux (Ubuntu / Fedora/ Debian / MinOS) / Windows

Turbo CPP VC++

15UIT308 DATA STRUCTURES AND ALGORITHMS LABORATORY L T PC
0 0 2 1

COURSE OBJECTIVES:

- To demonstrate the systematic way of solving problems using linear and non – linear data structures
- To demonstrate the hashing techniques
- To demonstrate the algorithms using graphs

LIST OF EXPERIMENTS

1. Implement singly linked lists
2. Implement doubly linked lists
3. Represent a polynomial as a linked list and write functions for polynomial addition
4. Implement stack ADT using array and linked list
5. Implement stack and use it to convert infix to postfix expression
6. Implement queue ADT use array and linked list
7. Implement an expression tree. Produce its pre-order, and post – order traversals
8. Implement binary search tree
9. Implement insertion and deletion in AVL trees
10. Implement priority queue using binary heaps
11. Implement hashing with open addressing
12. Implement Prim's algorithm using priority queues to find MST of an undirected graph

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of the course, the students will be able to

- Apply the knowledge in types of linked lists and dynamic memory allocation to develop solutions for various operations in linked lists and polynomial addition. (Apply)
- Apply the knowledge in stack and queue to implement various operations using array and linked list. (Apply)
- Develop solutions for implementing various tree structures like expression tree, binary search tree, AVL tree and binary heap.
- Develop solutions for resolving issues associated with arranging data in hashing using open addressing.
- Design solution for real world complex engineering problems like finding minimum spanning tree shortest path problem.

HARDWARE AND SOFTWARE REQUIRMENTS

Computer Required: 30 No's

Minimum Requirement: Processor: Processor: Pentium IV, Ram: 1GB, Hard Disk: 80GB

Software requirements:

Operating System: Linux(Ubuntu / Fedora / Debian / Mint OS) / Windows

Turbo C Version 3 or GCC Version 4 / Built in Linux / DEVC++

15UIT309 OPERATING SYSTEMS LABORATORY L T P C

(Common to CSE and IT) 0 021

COURSE OBJECTIVES:

- To demonstrate process management and CPU scheduling concepts
- To demonstrate memory management schemes
- To demonstrate disk scheduling

LIST OF EXPERIMENTS

1. Development of routines for inter process communication
2. Process creation and management
3. Simulation of CPU scheduling algorithms I
4. Simulation of CPU scheduling algorithms II
5. Simulation of Producer-consumer problem using semaphores
6. Implementation of deadlock avoidance and prevention algorithms
7. Implementation of memory management scheme I
8. Implementation of memory management scheme II
9. Implementation of Page replacement algorithms
10. Analysis of file allocation algorithms
11. Working with file system commands
12. Simulation of disk scheduling algorithms

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of the course, the students will be able to

- Apply the knowledge of process management and control to create solutions for system. (Apply)
- Select and apply various scheduling algorithm to schedule processor (Apply)
- Identify, formulate and analyze complex deadlock problem using various techniques. (Apply)
- Apply the knowledge of various memory management techniques in memory management (Apply)
- Apply the knowledge of disk scheduling algorithm to schedule disk (Apply)

HARDWARE AND SOFTWARE REQUIRMENTS

Computer Required: 30 No's

Minimum Requirement: Processor : Pentium IV, Ram: 1 GB, Hard Disk: 80 GB

Software Requirements:

Operating System: Linux (Ubuntu / Fedora / Debian / MintOS) / Windows

Turbo C Version 3 or GCC Version 4 / Built in Linux / DEVC++

Semester IV

Course Code	Course Title	L	T	P	C
THEORY					
15UMA421	Discrete Mathematics (Common to CSE and IT)	3	2	0	4
15UCS402	Java Programming (Common to CSE and IT)	3	0	0	3
15UIT403	Introduction to Human Computer Interaction	3	0	0	3
15UIT404	Software Engineering Methodologies	3	0	0	3
15UIT405	Database Management Systems	3	0	0	3
15UIT406	Computer Networks	3	0	0	3
15UGS431	Reasoning and Quantitative Aptitude (Common to ALL)	1	0	0	1
PRACTICAL					
15UCS407	Java Programming Laboratory (Common to CSE and IT)	0	0	2	1
15UIT408	Database Management Systems Laboratory	0	0	2	1
15UIT409	Computer Networks Laboratory	0	0	2	1
	TOTAL	**19**	**2**	**6**	**23**
Total No. of Credits – 23					

15UMA421	DISCRETE MATHEMATICS	L	T	P	C
	(Common to CSE & IT)	3	2	0	4

OBJECTIVES :

- To make the student acquire sound knowledge to test the logic of program.
- To familiarize the student to be aware of generating functions.
- To develop an understanding of the concepts of graphs and Trees.
- To acquaint the student with the concepts and properties of Lattices.

UNIT I LOGIC AND PROOFS 9 + 6

Propositional Logic – Propositional equivalences - Predicates and quantifiers – Nested Quantifiers - Rules of inference - Introduction to Proofs - Proof Methods and Strategy.

UNIT II COMBINATORICS 9 + 6

Permutations and Combinations - Mathematical inductions - Strong induction and well ordering - The basics of counting – The pigeonhole Principle –Recurrence relations – Solving Linear recurrence relations - Generating functions - Inclusion and exclusion and applications.

UNIT III GRAPHS 9 + 6

Graphs and graph models - Graph terminology and special types of graphs – Representing graphs and graph isomorphism – Connectivity - Euler and Hamilton paths - Trees, Spanning Trees (Definitions and properties only).

UNIT IV ALGEBRAIC STRUCTURES 9 + 6

Algebraic systems - Semi groups and Monoids – Groups - Subgroups and Homomorphisms - Cosets and Lagrange's theorem - Ring & Fields (Definitions and examples).

UNIT V LATTICES AND BOOLEAN ALGEBRA 9 + 6

Partial ordering – Posets - Lattices as Posets - Properties of lattices - Lattices as Algebraic systems – Sub lattices – Direct product and Homomorphism - Some Special lattices - Boolean Algebra.

TOTAL : 45 (L) + 30 (T) = 75 Periods

COURSE OUTCOMES:

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

- Apply the acquired knowledge of the concepts needed to test the logic of the program.
- Synthesize induction hypotheses and simple induction proofs which is a very important tool in computer science engineering.
- Identify the basic properties of graphs, trees and use these concepts to model simple applications.
- Analyze the structures on many levels.
- Apply the acquired knowledge of partial order, Lattices and Boolean algebra which play an important role in many disciplines of computer science**.**

TEXT BOOKS:

1. KENNETH H.ROSEN, "Discrete Mathematics and its Applications", Special Indian Edition, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 5th Edition, (2008).
2. TREMBLY J.P and MANOHAR R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 35th Re-print, (2008).

REFERENCE BOOKS:

1. RALPH. P. GRIMALDI, "Discrete and Combinatorial Mathematics: An Applied Introduction", Pearson Education, New Delhi, 4th Edition, (2002).
2. TAMILARASI.A, and NATARAJAN.A.M, "Discrete Mathematics and its Applications", Khanna Publishers, New Delhi, 3rd Edition, (2008).
3. SEYMOUR LIPSCHUTZ and MARK LIPSON, "Discrete Mathematics", Schaum's Outlines, Tata McGraw-Hill, New Delhi, 2nd Edition, (2007).
4. VEERARAJAN, T. "Discrete Mathematics with Graph Theory and Combinatorics", Tata McGraw-Hill, New Delhi, 7th Edition, (2008).
5. SENGADIR.T "Discrete Mathematics and Combinatorics", first imprision (2009), Pearson education , New Delhi
6. R.K.BISHT, K.S.DHAM, "Discrete methods", Oxford University Press , 5th Edision, New Delhi(2015).

	JAVA PROGRAMMING	L	T	P	C
15UCS402	(COMMON TO CSE & IT)	3	0	0	3

PRE –REQUISITE:COMPUTER PROGRAMMING

COURSE OBJECTIVES:

- To explain Java fundamentals.
- To introduce generic programming and exception handling mechanism.
- To impart knowledge in i/o and file systems.
- To learn the basic concepts of collections and GUI programming.

UNIT I JAVA FUNDAMENTALS 9

Introduction to Java –review of language constructs - Introducing classes, objects, and Methods: constructors- this keyword– garbage collections - A closer look at methods and classes: Access Specifiers – overloading – Static Members – Arrays – Strings.

UNIT II INHERITANCE AND INTERFACES 9

Inheritance: Basics – Member access and inheritance – Constructors and Inheritance – using super – Multilevel Inheritance – Super class references and subclass objects – method overriding – abstract class – final keyword – object class – Interfaces: Interface fundamentals – extending interface – multiple interfaces – nested interfaces.

UNIT III EXCEPTION HANDLING AND GENERIC PROGRAMMING 9

Exception Handling: Exception Hierarchy – Exception Handling fundamentals –– multiple catch clause – catching subclass exception – nested try blocks – throwing an exception – throwable – using finally – using throws – Built-in exceptions – Creating our own exception -Generics: Fundamentals – Bounded Types – Wildcard Arguments – Bounded Wildcards – Generic methods – Generic Constructors – Generic Class Hierarchy.

UNIT IV COLLECTIONS AND I/O 9

Collections: overview - List Interface – Queue Interface – Collection Classes: Linked List class – Accessing collection via iterator – Enumeration Interface – Stack – Using I/O: Byte Streams and character streams – Byte stream classes – character stream classes – predefined streams – using byte streams – File using byte streams – using character based streams – File I/O using character based streams: File Reader – File Writer

UNIT V GUI PROGRAMMING WITH SWING 9

Swing Fundamentals: Components and Containers – Layout Managers – Event Handling – Swing Controls: JTextField – Jlabel – Jbutton – Check boxes – Radio Buttons – JscrollPanel – Jlist - JComboBox – Working with Menus: Menu Basics – JmenuBar – Jmenu – JmenuItem – Create a Main Menu – Dialogs.

TOTAL:45Periods

COURSE OUTCOMES:

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

- Design classes and create objects for a given problem in Java.
- Illustrate inheritance and interfaces.
- Employ exception handling mechanisms in the solution to a problem and implement generic programming.
- Use collections to manipulate data for the given problem and Read/Write data from/into a file
- Create GUI based applications.

TEXT BOOKS:

1. Herbert Schildt, and Dale Skrien, “Java Fundamentals – A Comprehensive Introduction”, Tata McGraw Hill Education Private Limited, Special Indian Edition, 2013.

REFERENCE BOOKS:

1. Paul J. Deitel, and Harvey M. Deitel, “Java for Programmers”, Pearson Education,2nd Edition, 2012.
2. Cay Horstmann, and Gary Cornell, “Core Java Volume - I Fundamentals”, Prentice Hall, 9th Edition, 2011.
3. Herbert Schildt, “The Complete Reference JAVA 2” , Tata McGraw Hill, 5th Edition, 2002.
4. Trail: Learning the Java Language, http://docs.oracle.com/javase/tutorial/java/

15UIT403 INTRODUCTION TO HUMAN COMPUTER INTERACTION

L	T	P	C
3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the fundamentals of user interface design
- To provide concepts and guidelines of user interface
- To identify the impact of HCI, formulate and solve user interface issues.

UNIT I INTRODUCTION **8**

Introduction – Importance – Human – Computer interfaces – Characteristics of graphics interface – Direct manipulation graphical system – web user interface – popularity characteristic & principles

UNIT II HUMAN COMPUTER INTERFACE DESIGN PROCESS **10**

User interface design process – obstacles – usability – business functions – requirement analysis – Direct – Indirect methods – basic business functions – Design standards – system timings – structures of menus – functions of menus – contents of menu – formatting – phrasing the many – selecting menu choice – navigating menus – graphical menus.

UNIT III WINDOWS CHARACTERISTICS **9**

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 GUIDELINES AND FEEDBACK **9**

Text for web pages – effective feedback – guidance & assistance – internationalization accessibility – Icons – Image – Multimedia – coloring.

UNIT V WINDOWS LAYOUT **9**

Windows layout-test: proto types-kinds of test – retest – Information search – visualization – Hypermedia – www – Software tools.

TOTAL: 45PERIODS

COURSE OUTCOMES:

- Apply the Knowledge of user Interfaces and User Interface design Principles to design the web pages[Apply]
- Design the system components using User Interfaces with HCI concepts and Principles that meet with realistic constraints. [Apply]
- Apply the appropriate techniques in web systems using window based controls to provide valid conclusions[Apply]
- Conduct Investigations on different websites with modern IT tools to assess the Societal issues [Analyze]
- Apply the knowledge of different testing techniques to identify the problem in web designs [Apply]

TEXT BOOKS:

1. Wilbent. O. Galitz, "The Essential Guide To User Interface Design", John Wiley & Sons, 3rd Edition, 2011.
2. Alan Cooper, "The Essential of User Interface Design", Wiley –Dream Tech Ltd 9th Edition, 2014.

REFERENCE BOOKS:

1. Debbie Stone, Caroline Jarret, Mark Woodroffe, ShaileyMonicha, "User Interface Design and Evaluation (Interactive Technologies)", Morgan- Kaufmann Publishers, 2005.
2. Ben Sheiderman, "Design the User Interface", Pearson Education, 3rd Edition, 1998.
3. Ronald M. Baecker, Jonathan Grudin, William A.S. Buxton & Saul Greenberg (Editors Ben Sheiderman), "Readings in Human- Computer Interaction", Morgan-Kaufmann Publishers, 2nd Edition 1995
4. Ben Shneiderman and Catherine PlaisanSheiderman), "Designing the user Interface : Strategies for Effective Human- Computer Interaction", Addison-Wesley Publishing C., 5th Edition 1995

15UIT404	SOFTWARE ENGINEERING METHODOLOGIES	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Understand the phases in a software project
- Understand fundamental concepts of requirements engineering and Analysis Modeling
- Understand the major considerations for enterprise integration and deployment
- Learn various testing and maintenance measures

UNIT I SOFTWARE PROCESS 9

Introduction to Software Engineering, Software Process, Prescriptive Process Models and Specialized Process Models – Agile Models

UNIT II REQUIREMENTS ANALYSIS AND SPECIFICATION 9

Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management-Classical analysis: Structured system Analysis, Petri Nets-Data Dictionary

UNIT III SOFTWARE DESIGN 9

Design process – Design Concepts – Design Model-Design Heuristic – Architectural Design – Architectural styles, Architectural Design, Architectural Mapping using Data Flow – User Interface Design: Interface analysis, Interface Design – Introduction to real time software design – Component level Design: Designing Class based components, traditional Components.

UNIT IV TESTING AND IMPLEMENTATION 9

Software testing fundamentals – Internal and external views of Testing – white box testing – basis path testing – control structure testing-black box testing – Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing And Debugging – Software Implementation Techniques: Coding practices-Refactoring – Software Configuration Management.

UNIT V PROJECT MANAGEMENT 9

Estimation – FP Based, LOC Based, Make/Buy Decision, COCOMO II – Planning – Project Plan, Planning Process, RFP Risk management – Identification, Projection, RMMM – Scheduling and Tracking – Relationship between people and effort, Task Set & Network, Scheduling, EVA – Process and Project Metrics

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Demonstrate the current models and temperature for the software life cycle.
- Identify the requirement needed for the solution to a software problem.
- Apply appropriate software design and architecture for and application.
- Identify suitable testing techniques for software projects
- Choose suitable project planning & risk management for software projects.

TEXT BOOKS:

1. Roger Pressman. S, "Software Engineering - A Practitioner's Approach", McGraw-Hill International Edition, 7th Edition, 2010.
2. Ian Sommerville, "Software Engineering", Pearson Education Asia 9th edition, 2011.

REFERENCE BOOKS:

1. RajibMall, "Fundamentals of Software Engineering", PHI Learning Private Limited, 3rd Edition 2009.
2. PankajJalote, "Software Engineering, A Precise Approach Fundamentals of Software Engineering", Wiley India, 2010.
3. KelkarS.A., "Software Engineering", Prentice Hall of India Pvt Ltd, 2007.
4. Stephen R.Schach, "Software Engineering", Tata McGraw -Hill Publishing Company Limited, 2007.

15UIT405	DATABASE MANAGEMENT SYSTEMS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand basic ideas of databases system design
- To understand the Logical and Physical aspects of the DBMS architecture
- To understand the Normal forms
- To understand and apply the Transaction and Recovery controls
- To understand and apply databases storage techniques

UNIT I INTRODUCTION 9

Purpose of Database System - Views of data - Data Models - Database Languages - Database System Architecture - Database users and Administrator - Entity - Relationship Model (E-R model)- E-R Diagrams -- Introduction to relational databases, **Case Study: E-R Diagram for an University.**

UNIT II RELATIONAL MODEL 9

The relational Model - The catalog - Types -Keys - Relational Algebra - Domain Relational Calculus - Tuple Relational Calculus - Fundamental operations - Additional Operations - SQL fundamentals - Integrity - Triggers - Security - Advanced SQL features - Embedded SQL - Dynamic SQL - Missing Information - Views - Introduction to Distributed Databases and Client/Server Databases. **Case Study: Building DBMS Applications.**

UNIT III DATABASE DESIGN 9

Functional Dependencies - Non-loss Decomposition - Functional Dependencies - First, Second, Third Normal Forms, Dependency Preservation - Boyce/Codd Normal Form-Multi-Valued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form.

Case Study: Applications of Normal Forms.

UNIT IV TRANSACTIONS 9

Transaction Concepts – Transaction Recovery – ACID Properties – System Recover – Media Recovery – Two Phase Commit – Save Points – SQL Facilities for recovery – Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Intent Locking – Deadlock – Serializability- Recovery Isolation Levels – SQL facilities for Concurrency.

UNIT V IMPLEMENTATION TECHNIQUES 9

Overview of Physical Storage Media - Magnetic Disks - RAID - Tertiary storage - File Organization - Organization of Records in Files - Indexing and Hashing - Static Hashing - Dynamic Hashing - Query Processing Overview - Catalog Information for Cost Estimation - Selection Operation - Sorting - Join Operation - Database Tuning. **Case Study: File Organization in Windows**

TOTAL: 45PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the students will be able to

- Apply the knowledge of database systems to construct an E-R Model for any application [Apply]
- Design a DBMS for an application using Relational Models. [Apply]
- Select and apply appropriate techniques to develop a normalized database [Apply]
- Apply the knowledge of SQL techniques for recovery and concurrency [Apply}
- Analyze various storage techniques to improve the query processing [Anlayze].

TEXT BOOKS:

1. Abraham Siberschetz, Henry F. Korth, Sudharshan.S," Database System Concepts", Tata McGraw Hill, 5th Ed., 2010.
2. Date.C.J, Kannan.A, swamynathan.S", An Introduction to Database Systems", Pearson Education, 8th Ed., 2006

REFERENCE BOOKS:

1. RamezElmasri, Shamkant B. Navathe, "Fundamentals of Database Systems:, Pearson Addision Wesley, 4th Ed., 2007.
2. Raghu Ramakrishnan, "database Management Systems", Tata McGraw Hill, 3rd Ed.
3. Singh.S.K, "Database Systems Concepts, design and Applications", Pearson Education, 1st Ed., 2006.
4. Hector Garcia – Molina, Jeffrey D. Ullman, Jennifer Widom, "Database systems: The Complete Book", Pearson Education, 4th Ed., 2009.

15UIT406	COMPUTER NETWORKS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the functions of different layers
- To familiarize the network topologies and protocols
- To learn flow control and congestion control algorithm
- To explain IEEE standard employed in computer networking

UNIT I INTRODUCTION TO NETWORKS 9

Network hardware – Network software – Topologies – ISO/OSI layers – TCP/IP layers – Physical layer – Data rate of a channel – Guided transmission media.

UNIT II DATA LINK LAYER 9

Issues in the data link layer – Error correction and detection – Data link layer Protocols – Sliding window protocols – Medium access control protocols – CSMA/CD – Ethernet – token ring – FDDI-Wireless LAN – 802.11 architecture.

UNIT III NETWORK LAYER 9

Network components – Issues in the Network Layer – Routing algorithms – Internetworking – IP Address – IPV4 – Sub netting – CIDR – IPV6 – Internet Control Protocol – OSPF – BGP – Multicasting.

UNIT IV TRANSPORT LAYER 9

Transport Services – Elements of Transport Protocols – The Internet Transport Protocols: UDP & TCP – Congestion control – Congestion avoidance in network layer – Adaptive Flow Control – Adaptive Retransmission – QoS.

UNIT V APPLICATION LAYER 9

DNS – WWW – HTTP – FTP – SNMP – Email (SMTP, MIME, IMAP, and POP3) – Introduction to Cryptography – Symmetric & Public key Algorithms – IP Security – Firewalls.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of computer and communication fundamentals in Topologies and Physical Layer [Apply]
- Identify and analyze the complex problems in data link layer [Analyze]
- Conduct investigation of networking routing problems and provide solutions by applying the routing algorithms [Apply]
- Apply the knowledge of transport layer protocols to improve QOS in computer networks [Apply]
- Apply the ethical principles and contextual knowledge to assess societal, safety, and legal issues [Apply]

TEXT BOOKS:

1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A System Approach", Morgan Kauffmann Publishers, 3rd Edition, 2007.
2. Behrouz A. Forouzan, "Data communication and networking", McGraw-Hill Higher Education Edition, 2010.

REFERENCE BOOKS:

1. James F. Kuross, Keith W. Ross, "Computer Networking – A Top-Down Approach Featuring the internet", Pearson education, 5th Edition, 2009.
2. Nader F. Mir, "Computer and Communication Networks", Prentice Hall Publishers, 2nd Edition, 2010.
3. Comer, "Computer Networks and Internets with Internet Applications", Pearson Education 4th Edition, 2007.
4. Andrew S. Tanenbaum, "Computer Networks". Prentice Hall of India, 4th Edition, 2003.

15UGS431	REASONING AND QUANTITATIVE APTITUDE	L	T	P	C
		1	0	0	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To make the student acquire sound knowledge of the characteristic of quantitative and qualitative aptitude.
- To familiarize the student with various principles involved in solving mathematical problems.
- To develop an understanding of the basic concepts of reasoning skills.

UNIT I QUANTITATIVE APTITUDE 8

Numbers – HCF and LCM – Arithmetic and Geometric Progression – Averages – Percentages – Problems on ages – Profit and Loss – Simple and Compound Interest – Ratio and Proportion –Time – Speed – Distance – Time and Work – Pipes and Cistern – Problems on Trains – Permutation and Combination – Clocks – Calendars.

UNIT II VERBAL AND NON VERBAL REASONING 7

Analytical Reasoning – Circular and Linear arrangement – Direction problems – Blood relations- Analogy – Odd Man Out – Venn Diagrams – Letter series & arrangement – Alpha Numeric Series – Syllogism – Coding – Decoding.

TOTAL: 15PERIODS

COURSE OUTCOMES:

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

- Solve the problems on commercial mathematics and correlation (different measurements). (Apply)
- Interpret the graphical and numerical data. (Evaluate)

WEBSITES:

www.m4maths.com, www.indiabix.com, www.fresherworld.com, www.compusgate.co.in, www.indianstudyhub.in, www.tcyonline.com.

TEXT BOOKS

1. Dr. AgarwalR.S., “Quantitative Aptitude”, S.Chard Publications, New Delhi, 20th Edition, (2013)
2. AbijitGuha, “Quantitative Aptitude for Competitive Examination”, Tata McGraw Hill Publication, New Delhi, 4th Edition, (2011).
3. Praveen. R.V. “Quantitative Aptitude and Reasoning”, PHI Learning Pvt. Ltd., Delhi, 2nd Edition, (2013).

REFERENCE BOOKS:

1. Ashish Aggarwal, “Quick Arithmetic”, S. Chand Publications, New Delhi, 6th Revised Edition, (2014).
2. Dr.Sathgurunath’s V.A. “A Guide for Campus Recruitment”, Sagarikka Publications, Thiruchirapalli, 3rd Edition, (2011).

15UCS407	JAVA PROGRAMMING LABORATORY (Common to CSE & IT)	L	T	P	C
		0	0	2	1

PRE –REQUISITE:

COURSE OBJECTIVES :

- To demonstrate various features of Java.

LIST OF EXPERIMENTS

1. Write a java program to illustrate constructors.
2. Write a java program to demonstrate arrays and strings.
3. Write a java program to implement inheritance
4. Write a java program to demonstrate interface.
5. Write a java program to illustrate exception handling.
6. Write a java program to demonstrate generic programming
7. Write a java program to use collection.
8. Write a java program to perform File I/O.
9. Write a java program to design a Form with menus using Swing.
10. Write a java program to demonstrate Dialogs.

TOTAL: 30 Periods

COURSE OUTCOMES:

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

- Write a Java code to implement constructors, arrays and strings.
- Use inheritance in the design of solution to problems.
- Use Exception handling and generic programming in solutions to problems.
- Employ Collections and File I/O to solve problems
- Design GUI based applications

SOFTWARE AND HARDWARE REQUIREMENT

Hardware: COMPUTERS REQUIRED – 30 Nos.

Software:

1. OPERATING SYSTEM – WINDOWS 2000 / XP / NT OR LINUX
2. Java SE or Equivalent Edition.
3. Text Editor

15UIT408 DATABASE MANAGEMENT SYSTEMS LABORATORY L T P C

0 02 1

COURSE OBJECTIVES:

- To design a database
- To familiarize with a query language
- To develop various applications

List of Experiments

1. Implement Data Definition Language (DDL) commands in RDBMS
2. Implement Data Manipulation Language(DML) and Data Control Language (DCL) commands in RDBMS
3. Implement various integrity constraints
4. Implement High-Level Language extension with Cursors
5. Implement High-Level Language extension with Triggers
6. Implement Procedures and Functions
7. Implement embedded SQL
8. Implement database design using E-R Model and Normalization
9. Design and implementation of Payroll Processing System.
10. Design and implementation of Banking System
11. Design and implementation of Library Information System
12. Design and implementation of Online Test.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After successful Completion of this course, the student will be able to

- Apply the knowledge of DDL and DML in database design to solve the complex problems.
- Apply the knowledge of integrity constraints on a database
- Design a solution for PL/SQL queries using function, cursors and triggers
- Analyze the redundancy in database
- Function effectively as an individual and as a member for IT based products.

HARDWARE AND SOFTWARE REQUIREMENTS:

Computer required: 30 No's

Minimum Requirement: Processor: Pentium IV, RAM: 1 GB, Hard Disk: 80GB

Software Requirements:

Front end: VB/VC ++/Java

Back end: Oracle 11g, MYSQL, DB2

Platform: Windows 2000 Professional/XP

Oracle server could be loaded and can be connected from individual PCs.

15UIT409 COMPUTER NETWORKS LABORATORY L T P C

0 0 2 1

COURSE OBJECTIVES:

- To Understand the core concepts of networking and equips them to effectively troubleshoot and manage real – world network infrastructures.
- To be familiar with Simulation tools
- To examine the performance of the token ring network under different scenarios.
- To demonstrate the basics of designing a network, taking into consideration the users, services, and locations of the hosts.
- To examine the effect of ATM adaptation layers and service classes on the performance of the network.
- To configure and analyze the performance of the Routing Information Protocol (RIP) model.
- To demonstrate the congestion control algorithms implemented by the Transmission Control Protocol (TCP).
- To examine the effect of different queuing disciplines on packet delivery and delay for different services.
- To study the role of firewalls and Virtual Private Networks (VPNs) in providing security to shared public networks such as the Internet.
- To analyze the performance of an Internet application protocol and its relation to the underlying network protocols.

List of Experiments

1. Introduction (Basics of OPNET IT Guru Academic Edition)
2. Ethernet (A Direct Link Network with Media Access Control)
3. Token Ring (A Shared – Media Network with Media Access Control)
4. Switched LANs (A Set of Local Area Networks Interconnected by Switches)
5. Network Design (Planning a Network with Different Users, Hosts, and services)
6. ATM (A Connection – Oriented, Cell – Switching Technology)
7. RIP: Routing Information Protocol (A Routing Protocol based on the distance vector algorithm)
8. OSPF: Open Shortest Path First (A Routing Protocol based on the distance Link – State Algorithm
9. TCP: Transmission Control Protocol (A Reliable, Connection – Oriented, Byte-stream Service)
10. Queuing Disciplines (Order of Packet Transmission and Dropping)
11. RSVP: Resource Reservation Protocol Providing QoS by reserving Resources in the Network
12. Firewalls and VPN (Network Security and Virtual Private Networks)
13. Application (Network Application Performance Analysis)

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After successful Completion of this course, the student will be able to

- Apply the basic Knowledge of networking to analyze the flow of data and identify the Topology [Apply]
- Design a local area networks connected by various switches and hubs [Apply]
- To configure and analyze the performance of the Routing Information Protocol (RIP) Model [Analyze]
- Analyze the performance of the congestion control algorithms implemented by the Transmission Control Protocol TCP [Analyze]
- Apply the role of firewalls and Virtual Private Networks (VPNs) in Providing Security to shared public networks such as the Internet. [Apply]

Semester V

Course Code	Course Title	L	T	P	C
THEORY					
15UCS501	Internet and web Technology (Common to CSE and IT)	3	0	0	3
15UIT502	Data Warehousing and Data Mining	3	0	0	3
15UIT503	Graphics and Multimedia (Common to CSE and IT)	3	0	0	3
15UIT504	Analysis and Design of Algorithm	3	0	0	3
	Elective I	3	0	0	3
	Elective II	3	0	0	3
PRACTICAL					
15UCS507	Internet and Web Technology Laboratory (Common to CSE and IT)	0	0	2	1
15UIT508	Data Warehousing and Data Mining Laboratory	0	0	2	1
15UIT509	Graphics and Multimedia Laboratory (Common to CSE and IT)	0	0	2	1
15UGS531	Soft Skills and Communication Laboratory (CSE,EEE, IT,ECE)	0	0	2	1
	TOTAL	**18**	**0**	**8**	**22**
Total No. of credits – 22					

15UCS501	INTERNET AND WEB TECHNOLOGY (COMMON TO CSE & IT)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the various protocols and technologies behind internet
- To impart designing web sites
- To develop interactive web pages
- To write programs for server side

UNIT I INTERNETWORKING AND HTML 9

Working with TCP/IP - IP address –URL - WWW –HTTP –MIME - HTML Basics: Basic HTML– Headers - Linking - Images - Ordered and Unordered Lists - HTML Tables-HTML Frames-Basic HTML Forms.

UNIT II CSS AND HTML5 9

Basic CSS - CSS Properties - More CSS Syntax - Page Layout - Styling Page Sections - Introduction To Layout - Floating Elements - Sizing And Positioning. HTML5 Basics: Basic HTML5 New Elements–HTML5 Graphics – Canvas – SVG - CSS For Styling.

UNIT III JAVASCRIPT AND DOM 9

JavaScript: JavaScript Syntax - Program Logic - Arrays–Strings – Functions - The Document Object Model (DOM): Global DOM Objects - DOM Element Objects - The DOM Tree.

UNIT IV PHP 9

PHP: Server-Side Basics - PHP Basic Syntax - Arrays - Strings–Functions - Forms: Form Basics - Form Controls - Submitting Data - Processing Form Data In PHP - Querying a database in PHP: connecting to a database performing queries.

UNIT V AJAX AND XML 9

AJAX: AJAX concepts - using XMLHttpRequest to fetch data - Integrating PHP and AJAX - XML: What is XML - XML Document structure, Schemas and DTDs - Processing XML data – XSLT.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Design web pages using HTML.
- Make stylistic decisions with CSS and HTML5.
- Create interactive websites with JavaScript and DOM.
- Use PHP for server side programming.
- Enhance interactive websites with AJAX and XML.

TEXT BOOKS:

1. Jeffrey C. Jackson, “Web Technologies: A Computer Science Perspective”, Prentice Hall, 2007
2. Deitel and Deitel and Nieto, “Internet and World Wide Web - How to Program”, Prentice Hall,5th Edition, 2011.

REFERENCE BOOKS:

1. Marty Stepp, Jessica Miller, and Victoria Kirst , “Web Programming”, Step by Step Publication, 2nd edition, 2009
2. Robin Nixon, “Learning PHP, MySQL, JavaScript, CSS & HTML5 - A Step-by-Step Guide to Creating Dynamic Websites”, O'Reilly Media, 3rd Edition , 2014
3. Douglas E Comer, “Internet Book, The: Everything You Need to Know About Computer Networking and How the Internet Works”, 4/E, Prentice Hall, 2007
4. Kogent Learning Solutions Inc. , “Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book”, Dreamtech Press.

15UIT502	DATA WAREHOUSING AND DATA MINING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To familiarize the concepts of data warehousing
- To introduce the fundamentals of data mining and its functionalities
- To familiarize knowledge in different data mining techniques and algorithms
- To review various application domains of data mining

UNIT I DATA WAREHOUSING 9

Introduction to data Warehousing – An overview and definition – Differences between Operational Database Systems and Data Warehouses – Difference between OLTP&OLAP- Multidimensional Data Model – Star, Snowflakes, and Fact constellations schemas for Multidimensional Databases – OLAP Operation in Multi – dimensional Data Model: Roll–up, Drill Down, Slice &Dice, Pivot (Rotate) – Indexing OLAP Data – Type of OLAP Servers - OLAP versus MOLAP versus HOLAP – Data Warehouse Architecture – The Design of a Data warehouse – The Process of Data Warehouse Design – A3 – Tier Data Warehouse Architecture.

UNIT II DATA MINING 9

Introduction – Data – Types of data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a data Mining system with a Data Warehouse – Issues – Data Preprocessing.

UNIT III ASSOCIATION RULE MINING AND CLASSIFICATION 9

Mining Frequent Patterns, Associations and Correlations – Mining Methods –Mining Various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction – Basic Concepts – Decision Tree Induction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction.

UNIT IV CLUSTERING 9

Cluster Analysis – Types of data – Categorization of Major Clustering Methods-K-means – Partitioning Methods – Hierarchical Methods – Density- Based Methods – Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data- Constraint – Based Cluster Analysis – Outlier Analysis.

UNIT V ADVANCED MINING 9

Web mining – Web content mining – Introduction to Spatial mining & its primitives – spatial classification algorithm (ID3extension) – Spatial clustering algorithm (SD) – Introduction to temporal mining – Time Series – Temporal association rule.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Identify and analyze appropriate data warehousing techniques for a Engineering problems.[Analyze]
- Apply the basic knowledge of Preprocessing techniques for real time applications supports data mining concepts [Apply]
- Apply appropriate techniques to implement association mining and classification algorithms[Apply]
- Apply the knowledge of Clustering method for an application.[Apply]
- Analyze an appropriate mining method for an application to improve the mining process.[Analyze]

TEXT BOOKS:

1. Jiawei Han, MichelineKamber, “Data Mining Concepts and Techniques:”, Elsevier, 2nd Edition, 2008.
2. AlexBerso, Stephen J.Smith, “Data Warehousing, Data Mining & OLAP”, Tata McGraw-Hill, Tenth Reprint, 2007.

REFERENCE BOOKS:

1. Margaret H.Dunham, S.Sridhar, “Data Mining Introductory & Advance Topics “,GNU Press, 1st Edition, 2006.
2. C.S.R. Prabhu, “Data Warehousing: Concept, Techniques, Products and Applications Prentice Hall of India, 3rd Edition, 2008.
3. Pang Ning Tan, Michael Steinbach, Vipin Kumar, “Introduction to Data Mining”, Pearson Education, 1st Edition, 2011.
4. K.P. Soman, ShyamDiwakar and V. Ajay, “Insight into Data mining Theory and Practice”, Prentice Hall of India, Easter Economy Edition, 2006.

15UIT503	GRAPHICS AND MULTIMEDIA (COMMON TO CSE AND IT)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To impart the concept of output primitives, 2D Transformations and clipping algorithms.
- To instruct the basics of 3D object representation, viewing and its transformation.
- To introduce the concept of color models and applications of animation.
- To illustrate the concept of fractal and self-similarity objects
- To impart the fundamentals of Multimedia and its compression technique
- To instruct the basics of multimedia communication system and its applications

UNIT I 2D TRANSFORMATION 9

Output primitives – Line Drawing Algorithms – Two dimensional Geometric transformation – Pivot Point Rotation – Homogenous Coordinates – Two dimensional viewing – Clipping and Windowing – Line clipping algorithms (Cohen – Sutherland)

UNIT II 3D TRANSFORMATIONS AND VIEWING 9

Three Dimensional Concepts – Three -Dimensional object representations Polygons, Curved lines, Splines, Quadric Surfaces – Visualization of data sets – Three-Dimensional geometric and modeling transformations – Three-Dimensional viewing – visible surface detection

UNIT III COLOR MODELS & SELF SIMILARITY CURVES 9

Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Key frame, Introduction to Shading models – Flat and Smooth shading – Adding texture of faces – Fractals and Self similarity – Mandelbrot sets

UNIT IV MULTIMEDIA COMPRESSION 9

Multimedia – Media and data Streams – Medium and Traditional Data streams – sound and audio – MIDI Concepts – Image and Graphics –based –JPEG compression- H.261-DVI.

UNIT V MULTIMEDIA SYSTEMS AND APPLICATIONS 9

Optical Storage Systems – Multimedia Communication Systems – Database System – Synchronization issues – Applications – Video conferencing – Virtual reality.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

- Apply the knowledge of two dimensional transformation & clipping algorithm to draw output primitives (Apply)
- Apply knowledge of three dimensional transformations to represent & viewing of objects. (Apply)
- Describe the concept of color models & principles of shading models. (Apply)
- Implement Compression technique using multimedia concepts[Apply]
- Develop the multimedia Application like video Conferencing, virtual Reality. [Apply]

TEXT BOOKS:

1. Donald Hearn and Pauline Baker. M, "Computer Graphics C Version", Pearson ed., 2nd Edition, 2004.
2. Andleigh, Kand Kiran Thakrar. P, "Multimedia Systems and Design", 3rd Edition, 2015.

REFERENCE BOOKS:

1. Hill Jr. FS, Stephen Kelley, "Computer Graphics using OPENGL", Prentice Hall Education, 3rd Edition, 2007.
2. Foley, Vandam, Feiner and Huges, "Computer Graphics: Principles and Practice", Pearson Education, 2nd Edition, 2003.
3. Tay Vaughan, "Multimedia: Making it work", Tata McGraw-Hill Publishing Company Limited ion, 7th Edition, 2008.
4. Raff Steinmetz, KlaraNahrstedt, "Computing, Communication and Application – Multimedia", Pearson Education, 5th Edition, 2009.

15UIT504	ANALYSIS AND DESIGN OF ALGORITHMS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To analyze a problem and identify the computing requirements appropriate for its solutions
- To summarize sorting, searching algorithms and report algorithm design methods
- To become familiar with the different algorithm design techniques

UNIT I INTRODUCTION **9**

Introduction – Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types – Fundamentals of the Analysis of Algorithm Efficiency – Analysis Framework – Asymptotic Notions and its properties – Probabilistic analysis, Amortized analysis – Mathematical Analysis of Recursive and Non-Recursive Algorithm

UNIT II SEARCHING AND TRAVERSAL TECHNIQUES **9**

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute –force string matching – Divide and conquer methodology – Merge sort – Quick sort – Binary search – Efficient non – recursive binary tree traversal algorithm, Graph traversals – Breadth first search and Depth first search.

UNIT III ALGORITHMIC TECHNIQUES **9**

Dynamic Programming – Computing an Binomial Coefficient – Warshall's and Floyd' algorithm – Optimal Binary Search Trees – Greedy Technique – Prim's algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman Trees

UNIT IV BACKTRACKING AND BRANCH AND BOUND **9**

Backtracking – Recursive backtracking algorithm – n-Queens problem – Hamiltonian Circuit Problem – Subset Sum Problem – Branch and Bound – Assignment problem – Knapsack Problem – Traveling Salesman Problem

UNIT V COMPUTATIONAL COMPLEXITY AND PARALLEL ALGORITHMS **9**

Non Deterministic algorithms, The classes P, NP, NP Complete, NP hard Proofs for NP Complete Problems: Clique, Vertex Cover Parallel Algorithms: Introduction, models for parallel computing, Pointer doubling algorithm

TOTAL: 45PERIODS

COURSE OUTCOMES:

- Analyze the fundamentals of algorithm performance by using Probabilistic, Amortized and mathematical analysis (Analyze)
- Apply brute force, and divide and conquer Strategies for Sorting, Searching and non linear traversal problems (Apply)
- Apply dynamic Programming and greedy Strategies to solve shortest path problems (Apply)
- Apply backtracking and branch and bound Strategies to solve complex engineering Problems (Apply)
- Apply the Knowledge of non-deterministic algorithms to solve P, NP, NP Complete and NP hard Problems.
- Apply the knowledge in Parallel computing models to solve pointer doubling algorithm (Apply).

TEXT BOOKS

1. Anany Levitin, "Introduction to the Design & Analysis of Algorithm", Pearson Education Asia, Third Edition, 2012.
2. Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, "Computer Algorithms / C++", Universities Press, Second Edition, 2007.

REFERENCE BOOKS:

1. Thomas H Cormen, Charles E.L Leiserson, Ronald L Rivest, Clifford Stein, "Introduction to Algorithm", PHI Pvt. Ltd, Third Edition, 2012.
2. Fayez Gebali," Algorithms and Parallel Computing", Willy (Indian Paperback Edition), 2011.
3. Aho.A.V, Hopcroft.J.E, Ullman.J.D, "The Design and Analysis of Computer Algorithms", Pearson Education Asia, Third Edition, 2008.
4. Lee. R.C.T, Tseng.S.S, Chang.R.C, Tsai Y.T, "Introduction to the Design and Analysis of Algorithms A Stretegic Approach", McGraw-Hill Education, First Edition, 2005.

15UCS507	INTERNET AND WEB TECHNOLOGY LABORATORY (COMMON TO CSE & IT)	L	T	P	C
		0	0	2	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To design web pages
- To develop interactive web pages
- To process client requests through server scripts

LIST OF EXPERIMENTS

1. Create a web page using HTML and CSS
2. Validate a webpage using Java Script.
3. Demonstrate manipulation of DOM objects of a web page
4. Design a web form and process data while maintaining session using PHP
5. Handle database using PHP
6. Exchange data using XML in AJAX application
7. Manipulate data using XSLT in AJAX application
8. Mini Project (Minimum 3 Sessions or 10 Hours should be allocated).

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Design web pages using HTML and CSS
- Manipulate web pages using JavaScript and DOM
- Process client requests and generate web based responses
- Exchange and Manipulate XML data in AJAX applications
- Create and deploy web applications

HARDWARE/SOFTWARE REQUIREMENTS

Hardware

- Pentium P4, 2.8 GHz of higher
- 512MB (or higher) RAM
- 40 GB (or higher) HD;
- Windows XP with SP2 (or higher**)**

Software:

- Apache Web Server
- PHP
- MySQL
- AJAX
- XML Parser,Notepad++

15UIT508	DATA WAREHOUSING AND DATA MINING LABORATORY	L	T	P	C
		0	0	2	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To familiar with the algorithms of data mining
- To aware with the tools and techniques used for Knowledge Discovery in Databases
- To expose with the web mining and text mining

LIST OF EXPERIMENTS

1. Design and implement a Data Warehouse,
   i. Identify source tables and populate sample data.
   ii. Create the dimension table and fact table in the data warehouse
   iii. Design multi-dimensional data models namely Star, Snowflake and
   iv. Fact Constellation schemas for any one enterprise (ex. Banking, Insurance, Finance, Healthcare, manufacturing, Automobiles, sales etc.).
2. Explore WEKA Data Mining/Machine Learning Toolkit
   i. Downloading and/or installation of WEKA data mining toolkit.
   ii. Understand the features of WEKA tool kit such as Explorer,
   iii. Knowledge flow interface, Experimenter, command – line interface.
   iv. Navigate the options available in the WEKA (ex. Select attributes panel, Preprocess panel, classify panel, cluster panel, associate panel and visualize)
   v. Study the ARFF file format
   vi. Explore the available data sets in WEKA
   vii. Load a data set (ex. Weather dataset, Iris dataset, etc.)
3. Implementation of Apriori Algorithm.
4. Implementation of FP- Growth Algorithm.
5. Implementation of Bayesian Classification.
6. Implementation of Decision Tree, If-Then Rule.
7. Implementation of K-Nearest Neighbor Classification.
8. Implementation of Support Vector Machines and Regression.
9. Implementation of K- means clustering.
10. Implementation of any Hierarchical clustering algorithm.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of SQL to Create Data Warehouses
- Apply the Knowledge of Data mining tasks using a data Mining tool kit.
- Apply the association rule mining in Weka tool to predict the relationship among the values of attributes.
- Analyze the performance of various Classification algorithms.
- Apply the knowledge of clustering algorithms on different data sets

HARDWARE AND SOFTWARE REQUIRMENTS:

Hardware Requirements:

1. Computer Required: 30 No's
2. Minimum Requirement: Processor: Pentium IV, Ram 1GB, Hard Disk: 80 GB

Software Requirements:

1. Windows, WEKA, RapidMiner, DBMiner or Equivalent

15UIT509	GRAPHICS AND MULTIMEDIA LABORATORY (COMMON TO CSE AND IT)	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES

- To demonstrate the 2D,3D and geometric transformation
- To review graphics programming with OpenGL
- To familiarize with implementation of multimedia applications

List of experiments

1. Implementation of Line drawing Algorithm
2. Implementation of 2D Transformations, 2D Viewing and Clipping
3. Implementation of 3D Transformations
4. Implementation of color models(RGB, YIQ)
5. Generating Fractal images
6. Draw at least four basic graphics primitives using OpenGL
7. Draw 3D objects and scenes using OPENGL
8. Implementation of text compression algorithm using RLE and Static Huffman.
9. Implement image compression using Huffman algorithm
10. Perform animation using any Animation software (Macromedia Flash, Blender, CreaToetc)

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Implement line drawing algorithm for 2D transformation and clipping
- Make use of 3D concepts to produce realistic display
- Implement OpenGL programming concepts to create interactive computer graphics
- Apply compression techniques on images
- Develop the Multimedia applications

SOFTWARE AND HARDWARE REQUIREMENT

Hardware: Standalone desktops - 30 Nos. OR Server supporting 30 terminals or more

Software: C/C++, OpenGL 3.7 (precompiled GLUT libraries 3.7 - Open source), Any open source software like GIMP 2.6/Flash 8.0/Adobe Photoshop/Blender 2.5

15UGS531	SOFTSKILLS AND COMMUNICATION LABORATORY (CSE,EEE, IT,ECE)	L	T	P	C
		0	0	2	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To develop a requisite knowledge in communication skills and soft skills .
- To enhance the students' acumen in sharpening the skills to meet the global challenges and industrial needs

UNIT I **6**

Communication – Types of communication – Communication network – Communication Techniques- Barriers of Communication.

UNIT II **6**

Listening – Types of listening – Listening & Note Talking – Listening strategies – Barriers of Listening – Conversation & Oral skills – Improving fluency & self expression- Good Pronunciation.

UNIT III **6**

Reading comprehension – Enriching Vocabulary (restricted to 1000 words) – Error analysis – Visual perception – Transcoding – Formal and Informal letters – Resume writing – Report writing.

UNIT IV **6**

Attitude – Self Confidence – Leadership Qualities – Effective Time Management – Surviving stress (Emotional Intelligence) – Overcoming failure- Professional Ethics – Interpersonal Skills.

UNIT V **6**

Body Language – Types of Interview: Online interview, Mock Interview, Telephonic interview – GD - Presentation.

TOTAL: 30(L) = 30PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the students will be able to:

- Present ideas and in a flexible manner and differentiate & eliminate the ambiguity
- Write well-structured and easily readable reports, e-mails and articles on complex topics in an appropriate style
- Comprehend any address in English face to face and through different media like telephone and public announcement

REFERENCE BOOKS:

1. Allan Pease, Body Language, New Delhi, Sudha Publications (P) Ltd, 2005
2. Dr.Rathan Reddy, Team Development & Leadership, Mumbai, Jaico Publishing House, 2006
3. Chand.S, Soft Skills, New Delhi, S.Chand& Company Ltd, 2011
4. Career Press Editors, 101 Great Resumes, Mumbai, Jaico Publishing House, 2006

Semester VI

Course Code	Course Title	L	T	P	C
THEORY					
15UIT601	Cryptography and Network Security	3	0	0	3
15UIT602	Mobile Applications Development (Common to CSE and IT)	3	0	0	3
15UIT603	Compiler Design	3	0	0	3
	Elective III	3	0	0	3
	Elective IV	3	0	0	3
	Open Elective I	3	0	0	3
PRACTICAL					
15UIT607	Security Laboratory	0	0	2	1
15UIT608	Mobile Application Development Laboratory (Common to CSE and IT)	0	0	2	1
15UIT609	Technical Project	0	0	6	3
	TOTAL	**18**	**0**	**10**	**23**
Total No. of credits – 23					

15UIT601	CRYPTOGRAPHY AND NETWORK SECURITY	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To familiarize the symmetric and asymmetric encryption algorithms
- To explain the authentication and Hash function for improved security
- To review the network security applications such as firewalls, IDS and trusted systems

UNIT I INTRODUCTION TO CRYPTOGRAPHY 9

Security trends - Attacks and services - Classical crypto systems - Different types of ciphers - Basic Number theory - Groups, Rings, Fields- Modular Arithmetic - Euclidean Algorithm - Finite Fields of the form GF (p), Polynomial Arithmetic -Finite fields of the form GF(2 n) - Prime Numbers - Fermat and Euler's theorem.

UNIT II SYMMETRIC CIPHERS 9

Testing for Primality - Chinese Remainder theorem - Simple DES - Differential cryptanalysis - DES-Modes of operation - Triple DES -AES -RC4.

UNIT III HASH FUNCTIONS AND PUBLIC KEY CRYPTOGRAPHY 9

Discrete Logarithms - Computing discrete logs - RSA - Attacks - Diffie-Hellman key exchange - EIGamal Public key cryptosystems - Hash functions - Secure Hash - Birthday Attacks - MD5 - Digital signatures - RSA - EIGamal - DSA.

UNIT IV AUTHENTICATION APPLICATIONS 9

Authentication applications - Kerberos, X.509, PKI - Electronic Mail security - PGP, S/MIME - IP security -Web Security Considerations - SSL, TLS, Secure Electronic Transaction.

UNIT V SYSTEM SECURITY 9

System security - Intruders IDS - Honey pots - Malicious software - viruses - Firewalls - Security Standards.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of mathematical concepts to cryptography (Apply)
- Analyze the Strength of symmetric cipher algorithm (Analyze)
- Apply Public Key Cryptography and Make Use of Hash Functions in cryptography techniques (Apply)
- Select an appropriate techniques for Authentication applications (Analyze)
- Analyze the Network security design using available secure solutions (Analyze)

TEXT BOOKS:

1. William Stallings, "Cryptography and Network Security Principles and Practices", Pearson Education, 4th Edition, 2006.
2. Wade Trappe, Lawrence C Washington, “Introduction to Cryptography with coding theory”, Pearson, 2nd Edition, 2007.

REFERENCE BOOKS:

1. BehrouzA.Foruzan, "Cryptography and Network Security", Tata McGraw Hill, 2007.
2. Mao. W, "Modern Cryptography Theory and Practices", Pearson Education, 2nd Edition, 2007.
3. Bruce Schneier, "Applied Cryptography", John Willey and Sons, 2nd Edition, ISBN: 9971-51-348-X, 2002.
4. Roberta Bragg, Mark Rhodes, Keith Strassberg, "Network Security", Tata McgrawHill, ISBN-13: 978-0-07-058671-0, 2004.

15UIT602	MOBILE APPLICATIONS DEVELOPMENT COMMON TO CSE AND IT	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand the essentials of mobile apps development
- To understand the fundamental concept of designing and developing
- To learn the major considerations of graphics and multimedia.
- To learn the various testing process.

UNIT I GETTING STARTED WITH MOBILE APPS 7

Mobile platforms, Mobile apps development, Setting up an Android Studio Development Environment, Creating an Example Android App in Android Studio, A Tour of the Android Studio User Interface, Creating an Android Virtual Device (AVD) in Android Studio, Testing Android Studio Apps on a Physical Android Device, An Overview of the Android Architecture, The Anatomy of an Android Application.

UNIT II ELEMENTS OF DESIGNS 10

Understanding Android Application and Activity Lifecycles, Handling Android Activity State Changes with examples, Saving and Restoring the State of an Android Activity, Understanding Android Views, View Groups and Layouts, Android Table Layout and Table Row Tutorial Designing a User Interface using the Android Studio Designer Tool. Introduction to Android Fragments, Creating and Managing Overflow Menus on Android

UNIT III PROGRAMMING WITH MOBILE APPS 9

Creating an Android User Interface in Java Code, Using the Android Grid Layout Manager in Android Studio Designer, Working with the Android Grid Layout using XML Layout Resources, An Overview and Example of Android Event Handling, Android Touch and Multi-touch Event Handling, Detecting Common Gestures using the Android Gesture Detector Class, Implementing Custom Gesture and Pinch Recognition on Android.

UNIT IV ADVANCED MOBILE APPS AND ANIMATION 11

An Overview of Android Intents - Android Explicit Intents - A Worked Example, Android Implicit Intents - A Worked Example, Android Broadcast Intents and Broadcast Receivers, A Basic Overview of Android Threads and Thread Handlers, An Overview of Android Started and Bound Services, Overview of Android SQLite Databases, Understanding Android Content Providers, Implementing an Android Content Provider in Android Studio

UNIT V DATA BASE CONNECTIVITY AND TESTING 8

Implementing Video Playback on Androidusing the Video View and Media Controller Classes - Video Recording and Image Capture on Android using Camera Intents - Android Audio Recording and Playback using Media Player and Media Recorder - Working with the Google Maps Android API in Android Studio - Handling Different Android Devices and Displays - Signing and Preparing an Android Application for Release.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Apply appropriate key techniques and tools for developing and maintaining mobile Applications [Apply]
- Identify the user interface requirements for mobile platforms and analyze the appropriate strategies for Development and deployment [Analyze]
- Apply the Knowledge of advanced Java competency in mobile application development[Apply]
- Identify, review and analyze the appropriate UI layout for the mobile application development[Analyze]
- Develop mobile apps using Android as development platform with key focus on user experience design [create]

TEXT BOOKS:

1. Neil Smyth, "Android Studio Development Essentials," Android 6th Edition, 2015.
2. Barry A Burd, "Android Application Development All-in-One For Dummies, 2nd Edition", Wiley 2015

REFERENCE BOOKS:

1. Lauren Darcey and Shane Conder," Teach Yourself Android Application Development In 24 Hours Edition: I", SAMS, 2012.
2. Mike VanDrongelen, "Android Studio Cook Book", Packt Publishing, 2015.
3. Clifton Craig and Adam Gerfer, "Learn Android Studio", 1st Edition, 2015.
4. Kevin Grant and Chris Haseman, "Beginning Android Programming Development and Design", PeachpitPress, 2014.

15UIT603	COMPILER DESIGN	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the phases of operation of a computer
- To familiarize the design and implementation of a lexical analyzer and parser
- To demonstrate the code generation and optimization

UNIT I LEXICAL ANALYSIS 9

Introduction to Compiling - Compilers - Analysis of the source program - The phases - Cousins - The grouping of phases - Compiler construction tools. The role of the lexical analyzer - Input buffering - Specification of tokens - Recognition of tokens - A language for specifying lexical analyzer.

UNIT II SYNTAX ANALYSIS AND RUN-TIME ENVIROMENTS 9

Syntax Analysis - The role of the parser - Context - free grammars - Writing a Grammar - Top down parsing - Bottom-up Parsing - LR parsers - Constructing an SLR (1) parsing table. Type checking - Type systems - Specification of a simple type checker- Run-Time Environments - Source Language issues - Storage organization - Storage - allocation strategies

UNIT III INTERMEDIATE CODE GENERATION 9

Intermediate languages - Declarations - Assignment statements - Boolean expressions - Case statements - Back patching -Procedure calls

UNIT IV CODE GENERATION 9

Issues in the design of a code generator - The target machine - Run-time Storage management - Basic blocks and flow graphs - Next-use information - A simple code generator - Register allocation and assignment - The DAG representation of basic blocks - Generating code from DAG

UNIT V CODE OPTIMIZATION 9

Introduction - The principle sources of optimization - Peephole optimization - Optimization of basic blocks - Loops in flow graphs - Introduction to global data-flow analysis - Code improving transformations.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

- Apply the knowledge of lexical analysis phase to solve the problem of tokenization of a sequence of characters (Apply)
- Apply the knowledge of parsers to solve syntax analysis phase of programming statements (Apply)
- Analyze intermediate code generation and formulate intermediate codes for the output of syntax analyzer.
- Identify and analyze the issues of code generation using the principles of register allocation and assignment
- Apply various techniques on generated intermediate codes to solve the problem of code optimization

TEXT BOOKS:

1. Alfred V. Aho, Ravi Sethi Jeffrey, D. Ullman, "Compilers - Principles, Techniques and Tools", Pearson Education Asia, Second Edition, 2007.
2. David Galles, "Modern Compiler Design", Pearson Education Asia, First Edition, 2007.

REFERENCE BOOKS:

1. Steven S. Muchnick, Morgan, "Advanced Compiler Design & Implementation", Morgan Kaufmann, First Edition, 2000
2. Fisher. C.N LeBlanc, R.J "Crafting a Compiler with C", Pearson Education, First Edition, 2000
3. Puntambekar. A.A, "Compiler Design", Technical Publications, First Edition, 2010
4. Raghavan, "Principles of Compiler Design", Tata Mc-Graw Hill Education, First Edition, 2010.

15UIT607	SECURITY LABORATORY	L	T	P	C
		0	0	2	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- Be familiar with Network Security Concepts using classical cryptosystems
- Learn various symmetric and asymmetric security algorithms
- Demonstrate different open source tools for network security and analysis

LIST OF EXPERIMENTS

1. Study of TCP and UDP Sockets
2. Study of TCP/UDP performance
3. Implement the following SUBSTITUTION & TRANSPOSITION TECHNIQUES concepts:
   a. Caesar Cipher
   b. Play fair Cipher
   c. Hill Cipher
   d. Vigenere Cipher
   e. Rail fence-row & column Transformation
4. Implement the following algorithms
   a. DES
   b. RSA Algorithm
   c. Diffiee-Hellman
   d. SHA-1
5. Implement the SIGNATURE SCHEME- Digital Signature Standard
6. Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG)
7. Set up a honeypot and monitor the honeypot on network (KF Sensor)
8. Installation of rootkits and study about the variety of options
9. Perform wireless audit on an access point or a router and decrypt WEP and WPA. (NetStumbler)
10. Demonstrate intrusion detection system(ids) using any tool (snort or any other s/w)
11. Performance comparison of MAC protocols
12. Performance comparison of routing protocols

TOTAL: 30 PERIODS

COURSE OUTCOMES:

- Apply the classical cipher techniques (Apply)
- Develop the various symmetric and asymmetric Security Algorithms (Apply)
- Identify the different open source tools for network security analysis(Analyze)
- Analyze the network security designs using available secure solutions (Analyze)
- Analyze the Performance of Network Security Protocols(Analyze)

HARDWARE AND SOFTWARE REQUIRMENTS

1. Hardware: Standalone desktops -30 Nos. OR Serve supporting 30 terminals or more
2. Software: C/C++/Java or equivalent compiler, GnuPG, KF Sensor or Equivalent, Snort, Net Stumbler or Equivalent, Opnet.

15UIT608	MOBILE APPLICATIONS DEVELOMENTLABORATORY (COMMON TO CSE AND IT)	L	T	P	C
		0	0	2	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To demonstrate and develop the Mobile Application using various Tools and Techniques

LIST OF EXPERIMENTS:

1. Develop amobileapplication for student registration using GUI components demonstrate the following UI layouts.
   i. Linear Layout
   ii. Relative Layout
   iii. Table Layout
2. Develop a mobile application to demonstrate simple event handling (Calculator application)
3. Develop a mobile application to demonstrate Intent and Intent filters.
4. Develop a mobile application customized Sending Email, Sending SMS and Phone calls using intent.
5. Develop a mobile application to implement a custom design Action Bar.
6. Develop a mobile application for image Gallery Using Grid view.
7. Develop a mobile application to demonstrate List View and Web View.
8. Develop a mobile application to demonstrate Broadcast receiver.
9. Develop a mobile application to demonstrate SQlite Database.
10. Develop a simple media player like application using service.
11. Develop a mobile application to demonstrate location based services.
12. Develop a mobile application to integrate with Facebook and Twitter.
13. Develop a mobile application to demonstrate the firebase features.
14. Develop a simple Remainder application.
15. Develop a customized android chat application

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Demonstrate basic skills of using an integrated development environment (Android Studio) and Android Software Development Kit (SDK) for implementing Android applications.
- Demonstrate through a simple application the understanding of the basic concepts of Android
- Develop a working knowledge of the custom UI elements and positioning
- Use the Java programming language to build Android apps
- Store and manipulate data using Content Providers, Shared Preferences and Notifications

HARDWARE AND SOFTWARE REQUIRMENTS

Standalone desktops with Windows, Android or iOS or Equivalent Mobile Application Development Tools with appropriate emulators and debuggers - 30 Nos

15UIT609	TECHNICAL PROJECT	L	T	P	C
		0	0	6	3

PRE-REQUISITES:

COURSE OBJECTIVE:

To engage the student in integrated activities of reading, research, discussion and presentation around a designated subject.

This course is introduced to enrich the communication skills of the student and to create awareness on the recent developments in information technology through Technical presentation. In this course a student has to present at least two technical papers or recent advances in engineering /technology that will be evaluated by a committee constituted by the head of the department.

COURSE OUTCOMES

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

- Communicate the technical information effectively during the oral presentation and in writing reports
- Analyze small technical problems and develop proto type/model.

Semester VII

Course Code	Course Title	L	T	P	C
THEORY					
15UME701	Project Management and Finance(Common to MECH, CSE, ECE, EEE, IT, and EIE)	3	0	0	3
15UCS702	Insight into Cloud Computing (Common to CSE and IT)	3	0	0	3
15UIT703	Fundamentals of Image Processing	2	0	0	2
	Elective V	3	0	0	3
	Open Elective II / Multidisciplinary Project Phase I	3	0	0	3
PRACTICAL					
15UCS706	Cloud Computing Laboratory (Common to CSE and IT)	0	0	2	1
15UIT707	Image Processing Laboratory	0	0	2	1
	TOTAL	**14**	**0**	**4**	**16**
Total No. of Credits – 16					

15UME701	PROJECT MANAGEMENT AND FINANCE (Common to MECH, CSE, ECE, EEE, IT, EIE)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To impart knowledge to find solutions and approaches for various projects.
- To familiarize the utilization of project within time, resource and financial constraints.

UNIT I PROJECT MANAGEMENT CONCEPTS 9

Concept and characteristics of a project, importance of project management, types of project, project organizational structure, project life cycle, Statement of Work, Work Breakdown Structure.

UNIT II PROJECT PLANNING 9

Project Planning and Scheduling techniques - developing the project network using CPM/PERT, Limitations of CPM/PERT, Precedence Diagramming Method, constructing diagram and computations using precedence diagramming method, PERT/CPM simulation, reducing project duration.

UNIT III RESOURCES SCHEDULING & CRITICAL CHAIN SCHEDULING 9

Resource Scheduling - Resource allocation method, splitting and multitasking, Multi project resources scheduling - Critical Chain Scheduling -Concept of critical chain scheduling - critical chain scheduling method, application of Critical chain scheduling and limitations.

UNIT IV PROJECT QUALITY MANAGEMENT 9

Concept of project quality, responsibility for quality in projects, quality management at different stages of project, tools and techniques, Quality Management Systems, TQM in projects - Project Performance Measurement and Control - Monitor and assess project performance, schedule, and cost. Earned Value Management, performance measurement methods to monitor, evaluate and control planned cost and schedule performance - Project Closure/ Termination - Meaning of closure/ termination, project audit process, termination steps, final closure.

UNIT V FINANCIAL ACCOUNTING 9

Balance sheet and related concepts - Profit & Loss Statement and related concepts - Financial Ratio Analysis - Cash flow analysis - Funds flow analysis – Comparative financial statements. Investments - Average rate of return - Payback Period - Net Present Value - Internal rate of return.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

1. Explain the concept and characteristics of project management. (Understand)
2. Make use of CPM and PERT concepts to construct the project network. (Understand)
3. Utilize Theory of Constraints and Heuristic methods for allocating resources to a project. (Apply)
4. Demonstrate the various tools and techniques at different stages of Quality management. (Understand)
5. Design the balance sheet using trading, profit and loss account. (Apply)

TEXT BOOKS:

1. Prasanna Chandra, "'Fundamentals of Financial Management' ", Tata Mcgraw-Hill Publishing Ltd, 2005.
2. Jack Meredith, Samuel J.Mantel, "Project Management- A Managerial Approach", John Wiley and Sons.

REFERENCE BOOKS:

1. Clifford F Gray, Erik W Larson, "Project Management-The Managerial Process ", Tata Mcgraw-Hill Publishing Co Ltd.
2. John M Nicholas, "Project Management For Business And Technology", Prentice Hall of India Pvt Ltd.
3. Paresh Shah, "Basic Financial Accounting for Management", Oxford University Press, 2007.

15UCS702	INSIGHT INTO CLOUD COMPUTING (Common to CSE & IT)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the essentials of building fully featured applications on various cloud models.
- To familiarize the concepts of designing and developing various service models (IaaS, PaaS and SaaS) and deployment models (Public, Private and Hybrid clouds).
- To impart the knowledge of Multi-cloud management systems and business clouds.

UNIT I OVERVIEW OF CLOUD COMPUTING 8

Introduction to Cloud Computing- Cloud Computing in a Nut Shell, Roots of Cloud Computing, Desired Features of a Cloud, Cloud service models (IaaS, PaaS&SaaS). Cloud deployment models (Public, Private, Hybrid and Community Cloud), Benefits and Challenges of Cloud Computing.

UNIT II INFRASTRUCTURE AS A SERVICE 9

Basics of Virtualization, Virtualization Technologies, Server Virtualization, VM migration techniques, Role of virtualization in Cloud Computing. Anatomy of Cloud infrastructures, Distributed Management of Virtual Infrastructures, Scheduling Techniques for advance reservation of Capacity.

UNIT III PLATFORM AS A SERVICE/SOFTWARE AS A SERVICE 10

Aneka – Technologies and Tools for Cloud Computing, Aneka Cloud Platform, Aneka Resource Provisioning Service, Hybrid Cloud implementation, Workflow engine for clouds – Workflow management Systems and Cloud, Architecture, Utilizing Cloud for workflow execution, The Map Reduce Programming model and Implementation – Map Reduce Programming model, Major Map Reduce implementation for the cloud, Case Studies

UNIT IV CLOUD SECURITY 9

Security concerns in Traditional IT, Challenges in Cloud Computing in terms of Application Security, Server Security, and Network Security. Security reference model, Abuse and Nefarious Use of Cloud Computing, Insecure Interfaces and APIs, Malicious Insiders, Shared Technology Issues, Data Loss or Leakage, Account or Service Hijacking, Unknown Risk Profile, Different vendors offering Cloud Security for public and private clouds.

UNIT V MULTI-CLOUD MANAGEMENT SYSTEM AND BUSINESS CLOUDS 9

Concept of multi-cloud management, Challenges in managing heterogeneous clouds, benefits and advantages of multi-cloud management systems.

Cloud Computing in Business, Various Biz Clouds focused on industry domains (Retail, Banking and Financial sector, Life Sciences, Social networking, Telecom, Education).

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the source, the student will be able to

- Explain the concepts of Cloud Computing and the various deployment and service models of Cloud Computing.
- Apply the virtualization techniques to provide IaaS.
- Apply Aneka tools and other techniques to provide PaaS and SaaS.
- Identify issues of security concerns in Cloud Computing.
- Describe Multi-Cloud management System for various applications.

TEXT BOOKS:

1. Raj Kumar Buyya, James Broberg, AndrezeiM.Goscinski," Cloud Computing: Principles and paradigms", Wiley 2013.

REFERENCE BOOKS:

1. Ronald L.Krutz and Russell Dean Vines: Cloud Security – A Comprehensive Guide to Secure Cloud Computing, Wiley 2010.
2. Anthony T Velte,Cloud Computing: A practical Approachll, Tata McGraw Hill, 2009.
3. Michael Miller,"Cloud Computing", Pearson Education, New Delhi, 2009.
4. Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper, "Cloud Computing For Dummies", Wiley 2010.

15UIT703	FUNDAMENTALS OF IMAGE PROCESSING	L	T	P	C
		2	0	0	2

PRE-REQUISITES:

COURSE OBJECTIVE:

- To Understand digital image processing beyond just the fundamental or introductory level
- To choose appropriate image processing algorithms to achieve a desired result
- To properly implement such algorithms using modern computing tools such as MATLAB

UNIT I DIGITAL IMAGE FUNDAMENTALS 10

Fundamentals steps in digital image processing systems, Elements of visual perception, brightness, contrast, hue, saturation, Mach band effect, Color image fundamentals – RGB, HIS models, Image sampling, Quantization, dither, Two-dimensional mathematical preliminaries, 2D transforms – DFT, DCT, KLT, SVD

UNIT II IMAGE ENHANCEMENT & RESTORATION 10

Image Enhancement: Spatial Domain Methods – Histogram Processing, Smoothing spatial filters. Frequency Domain Methods-Smoothing, Sharping Filters, Image Restoration: Noise modals. Restoration in the presence of Noise only spatial filtering, periodic noise reduction by frequency domain filtering, Inverse filtering, wiener filtering.

UNIT III IMAGE SEGMENTATION AND FEATURE EXTRACTION 10

Detection of discontinuities – Edge operators – Edge linking and boundary detection – Thresholding – Region based segmentation – Morphological watersheds – Motion segmentation – Feature extraction and analysis.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of enhancement techniques for an Image
- Formulate the extract information from an image
- Design and simulate digital IIR and FIR filters for public health and safety considerations
- Demonstrate the edge and line detection for a real time application
- Select and apply appropriate techniques of histogram for an application

TEXT BOOKS:

1. Rafael C, Gonzalex& Richard E.Woods, "Digital Image Processing, Pearson Education", 2nd edition, 2006.
2. Schalkoff. R.J, "Digital Image Processing and Computer Vision", 1st Edition, John Wiley and Sons, NY, 2009.

REFERENCE BOOKS:

1. Pratt. W.K, "Digital Image Processing", 3rd Edition John Wiley & sons, 2006.
2. Sonkaet. M, al, "Image Processing, Analysis and Machine Vision", 3rd edition, Thomson Learning, India 2007
3. Kenneth. R,Castleman, "Digital Image Processing", Pearson Education, 1995.
4. Jeyaraman. S, Sakkirajan. S, Veerakumar. T, "Digital Image Processing", McGraw Hill Education, 2009.

WEB REFERENCES:

1.http://ocw.mit.edu/courses/health-sciences-and-technology/hst-582j-biomedical-signal-and-imageprocessing-spring-2007/lecture-notes/

2. http://inst.eecs.berkeley.edu/~ee225b/fa12/lectures/

3. http://www.debugmode.com/imagecmp/

MULTIDISCIPLINARY PROJECT PHASE - I

Year: 2018-2019 **Rev.:02**

Theoretical Physics on Motion **(6 Hours)**

Newton's laws of motion - Dynamics of particle in rectilinear and circular motion -Conservative and Non - Conservative forces - Conservation of energy - Linear momentum and Angular momentum - Collision in one and two dimensions - Euler's Laws of Motion - Rotational energy and Rotational Inertia for simple bodies - Combined Translational and rotational motion of a rigid body on horizontal and inclined planes - Torsion of Cylinder - Simple Harmonic Motion - Differential equation of S. H. M. and its Solution - Damped and Forced vibrations.

Simulation of Static and Dynamic Bodies **(15 Hours)**

Simulation – Computer simulation – Animation – Engineering animation – Simulation of Mechanical – Electrical – Electronic systems

Geometric Modeling – Finite Element Analysis – FEA Model - Load data – Material Properties - Boundary conditions – Analysis the Result-Linear and Non-linear Analysis -FEA Software's

Simulation of Motion – Dynamic bodies/particles – Spring elements – Damper elements - Inertia elements - Casestudies:Driveline of automobiles-Suspension system- steering systems

Vehicle Dynamics – Dynamic analysis software –– Material properties – Connecting moving parts, joints – Apply Load and Torque – Analysis of the Result –Modal Analysis-

Computational Fluid Dynamics - Assembly Modeling - Crash Analysis

COMMUNICATION **(6 Hours)**

Evolution of wireless communication technology, 3G, 4G, 5G and molecular communication - Short range communication - RFID – Bluetooth – Zigbee –Wifi – Rflinks, long range communication – Satellite communication, Mobile Internet - nodes, networks, Ad-Hoc networks, Mobile Ad-Hoc networks, Architecture of mobile ad-hoc networks, Mobile ad-hoc network challenges, Mobile ad-hoc networks routing protocols

Case study

- Super market services
- Car to Car communication, VANET (an application of Mobile ad-hoc network)
- mHealth, mobile ad-hoc network for E-health care system, wearable and implantable sensors using an ad-hoc network

IMAGE PROCESSING **(6 Hours)**

3D Image- Capturing-Preprocessing- Image Enhancement- Segmentation-Feature Extraction-Classification-Object Detection-Video Analytics-Image registration-Image Fusion-Morphological Image Processing.

Software: MATLAB, SCILAB

Case Study:

- Image guided adaptive radiation therapy. (Health Care)
- Automatic Car number plate detection.
- Counting Vehicle & Speed Measurement
- Image processing for Driver assistance system.
- Automated Traffic Surveillance system

HUMAN COMPUTER INTERACTION (12 Hours)

Sensors

Acceleration sensor, level sensors, speedometer, manifold absolute Pressure sensor(MAP), pressure sensor, throttle, position sensor, knock sensor, automobile oxygen sensor, proximity sensor, radar sensor, speed sensor, temperature sensor, torque sensor, IR sensor, smart sensor, MEMS sensors, Data acquisition system and interfacing devices.

Human Computer Interface

Text, Speech recognition and synthesis - Haptic Technology - Web markup language.

Cloud Computing and Internet of Things

Cloud computing Architecture – Services –Types of clouds - IOT – IOT to Web of Things

Artificial Intelligence

AI Fundamentals - Searching Techniques -Knowledge Representation Issues -Using Predicate Logic and Representing Knowledge as Rules -Statistical Reasoning -Important Applications

Machine Learning

Introduction to Machine Learning - Supervised Learning -Unsupervised Learning -Reinforcement Learning -Recommender Systems

Software: IBM Watson, Microsoft Azure Machine Learning, Google Cloud Prediction API, Tensor Flow, Infosys Nia, Wipro Holmes, Open CV

DATA ANALYTICS AND OPTIMIZATION (9 Hours)

Introduction –Queuing Theory and its application–Data – Data Processing- Data Retrieval- Conventional Data Model (DBMS& RDBMS) - Stream Data Model –Bulk Data Model – Hybrid Data Model - Computational approaches to modeling – Summarization – Feature Extraction – Statistical Limits on Data Mining - Distributed File Systems – Map-reduce – Algorithms using Map Reduce – Efficiency of Cluster Computing Techniques.

Nearest Neighbor Search – Similarity preserving summaries – Locality Sensitive Hashing (LSH) for documents –LSH Families

Page Rank –Efficient Computation – Link Spam – Market Basket Model –Handling Larger Datasets in Main Memory –Counting Frequent Item sets.

Software Tools:Wega, IBM Modeler, Hadoop, R Programming

Case Study

1. Luxury Car Maker Uses Data Analytics to Build Next-Generation Vehicles (Mercedes-AMG: A Showcase for Real-Time Business Decisions)

2. Railways
3. Airlines

SOCIAL NETWORKS (3 Hours)

Introduction - Niche social networks- Use of Social Network (Face book, LinkedIn, Amazon, Google+, Skype, Twitter) - Commonalities among social networks, Difference between social networks –Linking one social network to other. Concept of Social network thro' available (day-to-day) network - social network data and statistics

ROBOTICS (6 hours)

Robot anatomy- Definition, law of robotics, -Types of robots –Robot components – Specifications – Joint Link- Drive systems and End Effectors -Sensors and Machine Vision -Robot Control - Forward Kinematics- Robot transformations - Inverse Kinematics of Manipulators with 3(in 2 Dimension) or 4(in 4 Dimension) Degree of freedom- Trajectory Planning –-Robot programming languages –VAL programming -

Case Study on Virtual robotics

1. An augmented reality interface for training robotics through the web

Total Hours: 63hours

Chapter No.	Topics	Hours	Pages
1	Theoretical Physics on Motion	6	100
2	Simulation of Static and Dynamic Bodies	15	250
3	Communication	6	100
4	Image Processing	6	100
5	Human Computer Interaction	12	200
6	Data Analytics and Optimization	9	150
7	Social Networks	3	50
8	Robotics	6	100

15UCS706	CLOUD COMPUTING LABORATORY (COMMON TO CSE & IT)	L	T	P	C
		0	0	2	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To demonstrate how to use Cloud Services

LIST OF EXPERIMENTS:

1. Study and Usage of Google Apps.
2. Implement Virtual OS using virtual box.
3. Simulate VM allocation algorithm using CloudSim
4. Simulate Task Scheduling algorithm using CloudSim
5. Simulate Energy-conscious model using CloudSim
6. Setup a Private Cloud Using Open Stack or Eucalyptus.
7. Install and configure Open Stack Object Storage - Swift in Ubuntu
8. Implement Open Stack Nova-Compute
9. Implement Open Stack Image services – Glance.
10. Implement Map Reduce concept for an application.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Analyze the use of Cloud Applications
- Apply resource allocation and scheduling algorithms.
- Implement Energy-conscious model.
- Create virtual machines from available physical resources.
- Design a private cloud.

HARDWARE AND SOFTWARE REQUIRMENTS

HARDWARE: COMPUTERS REQUIRED – 30 Nos

SOFTWARE: Eucalyptus or Open Nebula or Cloudsim or equivalent

15UIT707	IMAGE PROCESSING LABORATORY	L	T	P	C
		0	0	2	1

COURSE :

PRE-REQUISITES:

LIST OF EXPERIMENTS

1. Point processing in spatial domain
   A) Negation of an image
   B) Thresholding of an image
   C) Contrast stretching of an image
2. A. Conversion of RGB to Gray level image
   B. Conversion of RGB to HSI
3. Histogram Equalization
4. Histogram Specification
5. Filtering in spatial domain
   A) Low Pass filtering
   B) High Pass filtering
   C) Median filtering
6. Edge detection using derivative filter mask
   A) Prewitt
   B) Sobel
   C) Laplacian
7. Data compression using Huffman coding
8. Filtering in frequency domain
   A) Low Pass filter
   B) High Pass filter
9. Implementation of edge operators for a real time application
10. Implementation of morphological operations

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of enhancement techniques for an Image
- Formulate the extract information from an image
- Design and simulate digital IIR and FIR filters for public health and safety considerations
- Demonstrate the edge and line detection for a real time application
- Select and apply appropriate techniques of histogram for an application

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware: Computers Required: 30 Nos

Software: MATLAB9, LABVIEW, SCILAB

Semester VIII

Course Code	Course Title	L	T	P	C
THEORY					
15UME801	Professional Ethics (Common to ALL)	2	0	0	2
	Elective VI	3	0	0	3
	Open Elective III	3	0	0	3
PRACTICAL					
15UIT804	Project Work	0	0	24	12
	TOTAL	**8**	**0**	**24**	**20**
Total No. of Credits – 20					

15UME801	PROFESSIONAL ETHICS (COMMON TO ALL BRANCHES)	L	T	P	C
		2	0	0	2

PRE-REQUISITES:

COURSE OBJECTIVE:

- To impart knowledge on a values-based approach and provide a method of thinking about and dealing with ethical issues in the work place.
- To explain what a profession is and what it means to act professionally.

UNIT I ENGINEERING ETHICS 9

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional Ideals and Virtues – Uses of Ethical Theories.

UNIT II ENGINEERING AS SOCIAL EXPERIMENTATION 10

Engineering as Experimentation – Engineers as responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Assessment of safety and risk – Risk Benefit analysis – Professional Rights – Employee rights – Intellectual Property Rights

UNIT III GLOBAL ISSUES 11

Multinational Corporations – Business Ethics - Environmental Ethics – Computer Ethics - Role in Technological Development – Engineers as Managers – Consulting Engineers – Honesty – Moral Leadership – Sample Code of Conduct.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to

- Illustrate the basic perception of profession, professional ethics and various moral issues.(Understand)
- Describe the code of ethics and role of professional ethics in engineering field. (Understand)
- Apply ethical principles to resolve global and cross cultural issues that arise in professional career.(Apply)

TEXT BOOKS:

1. Subramanian. R , “Professional Ethics”, Oxford University press India, New Delhi First edition, 2013.
2. Dhinesh Babu.S, “Professional Ethics and Human Values”, Laxmi Publications, New Delhi, Reprint, 2016.

REFERENCE BOOKS:

1. Jayakumar.V, “Professional Ethics in Engineering”, Lakshmi Publications, Chennai.
2. John R Boatright, “Ethics and the Conduct of Business”, Pearson Education, 2003.
3. Edmund G Seebauer, Robert L Barry “Fundamentals of Ethics for Scientists and Engineers”, OxfordUniversity Press, 2001.
4. David Ermann, Michele S Shauf “Computers, Ethics and Society”, OxfordUniversity Press,2003.

15UIT804	PROJECT WORK	L	T	P	C
		0	0	24	12

PRE-REQUISITES:

COURSE OBJECTIVE:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same
- To train the students in preparing project reports
- To prepare the students to face reviews and viva voice examination

PROJECT DESCRIPTION

- Twenty four periods per week shall be allotted in the timetable and this time shall be utilized by the students to receive the directions from the guide, on library reading, laboratory work, and computer analysis of field work as assigned by the guide and also to presenting periodical seminars on the progress made in the project.
- The aim of the project work is to deepen comprehension of principles by applying them to a new problem which may be the design and manufacture of a device, a research investigation, a computer or management project or a design problem.
- The progress of the project is evaluated based on a minimum of three reviews.

COURSE OUTCOMES:

After successful completion of this course, the students will be able to

- Identify and solve problems pertaining to information Technology
- Develop IT based solution for real world problems
- Build the project as a Team or as an individual
- Elaborate their views in terms of preparing reports and presentation skills
- Engage in independent learning for effective implementation of the project

PROFESSIONAL ELECTIVES

Course Code	Course Title	L	T	P	C
	PROFESSIONAL ELECTIVES				
15UIT901	Programming Paradigms	3	0	0	3
15UIT902	Formal Language and Automata	3	0	0	3
15UIT903	Artificial Intelligence and Knowledge Engineering	3	0	0	3
15UIT904	Distributed Operating System	3	0	0	3
15UIT905	Internet of Everything	3	0	0	3
15UIT906	Embedded Systems	3	0	0	3
15UIT907	Next Generation Networks	3	0	0	3
15UIT908	Paradigms in Green Computing	3	0	0	3
15UIT909	Wireless Communication	3	0	0	3
15UIT910	Building Enterprise Applications	3	0	0	3
15UIT911	Software Testing	3	0	0	3
15UIT912	Adhoc and Sensor Networks	3	0	0	3
15UIT913	Data Administration and Tuning	3	0	0	3
15UIT914	Data Analytics	2	0	2	3
15UIT915	System Software Internals	3	0	0	3
15UIT916	Intelligent Agents	3	0	0	3
15UIT917	Enterprise Architectures	3	0	0	3
15UIT918	Database Technology	2	0	2	3
15UIT919	Free and Open Source Software	2	0	2	3
15UIT920	Web Mining and Social Networking	3	0	0	3
15UIT921	Ethical Hacking and Information Forensics	3	0	0	3
15UIT922	Semantic Web Engineering	3	0	0	3
15UIT923	Neuro Fuzzy Systems	3	0	0	3
15UIT924	Agile Software Development(Common to CSE and IT)	3	0	0	3
15UIT925	Information Retrieval Methods	3	0	0	3
15UIT926	Visualization Techniques	3	0	0	3
15UIT927	Mobility Engineering	3	0	0	3
15UIT928	Nature and Bio-Inspired Computing	3	0	0	3
15UIT929	Unix Internals	3	0	0	3
15UIT930	Programming with Python	3	0	0	3
15UIT931	Object Oriented System Design	3	0	0	3
15UIT932	Organizational Behavior	3	0	0	3
15UCS902	Information Storage Management	3	0	0	3
15UCS925	Business Intelligence and its Applications	3	0	0	3

15UIT901	PROGRAMMING PARADIGMS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To develop an in-depth understanding of functional, logic, and object-oriented programming paradigms
- To understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing
- To understand the concepts of object-oriented, event driven and concurrent programming paradigms and develop skills in using these paradigms using Java

UNIT I OBJECT -ORIENTED PROGRAMING PARADIGM 8

Object oriented programming concepts - objects - classes - methods and messages - abstraction and encapsulation - inheritance class hierarchy - polymorphism - dynamic binding - final keyword - abstract classes - Object class -Reflection - interfaces - object cloning - inner classes - proxies - abstract classes - polymorphism.

UNIT II PROGRAMMING TECHNIQUES 9

Basic of C++ Programming - Basics of JAVA Programming - Basics of Python Programming - Functional Programming: Haskell - J2EE Architecture, DOTNET Architecture - J2EE Web services - Asat– DOJO

UNIT III EVENT - DRIVEN PROGRAMMING 10

Graphics programming - Frame - Components - working with 2D shapes - Using color, fonts, and images - Basics of event handling - event handlers - adapter classes - actions - mouse events - AWT event hierarchy - introduction to Swing - Model - View - Controller design pattern - buttons - layout management - Swing - Components - Angular JS - Data Bases - SP & functions.

UNIT IV GENERIC PROGRAMMING 9

Motivation for generic programming - generic classes - generic methods - generic code and virtual machine - inheritance and generics - reflection and generics - exceptions - exception hierarchy - throwing and catching exceptions - Stack Trace Elements -assertions - logging.

UNIT V CONCURRENT PROGRAMMING 9

Multi-threaded programming - interrupting threads - thread states - thread properties - thread synchronization - thread-sage Collections - Executors - synchronizers - threads and event-driven programming.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Explain the fundamentals of object oriented programming [Understand]
- Make use of various types of Programming Techniques [Apply]
- Make use of event driven programming concepts [Apply]
- Apply multiple programming paradigms [Apply]
- Design and develop logic, functional, and concurrent programs [Apply]

TEXT BOOKS:

1. Cay S. Horstmann and Gary Cornell, "Core Java: Volume I - Fundamentals", Sun Microsystems Press, 8th Edition 2008.
2. Sayed Roosta, "Foundations of Programming Languages Design & Implementation", Cenege learning, 2003.
3. Allen B. Tucker and Robert E. Noonan, "Programming Languages -Principles and Paradigms", Tata McGraw Hill, 2nd Edition 2009.

REFERENCE BOOKS:

1. K. Arnold and J. Gosling, "The JAVA Programming Language", Pearson Education, 3rd Edition, 2000.
2. Timothy Budd, "Understanding Object-oriented programming with Java", Pearson Education, 2000.
3. C. Thomas Wu, "An introduction to Object-oriented programming with Java", Tata McGraw-Hill Publishing company Ltd, 4th Edition, 2006.
4. Ravi Sethi, "Programming Languages: Concepts and Constructs", Pearson Education, Addison-Wesley, 1996.

15UIT902	FORMAL LANGUAGE AND AUTOMATA	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Classify machines o recognize languages
- Employ finite state machines to solve problems in computing
- Explain deterministic and non-deterministic automata
- Comprehend the hierarchy of problems arising in the computer sciences
- Use of turning machine to Recognize the language

UNIT I FUNDAMENTALS **9**

Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic automaton and non-deterministic finite automation, transition diagrams and Language recognizers.

UNIT II REGULAR LANGUAGES **9**

Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expression, conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets.

UNIT III CONTEXT FREE GRAMMARS **9**

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

UNIT IV TURING MACHINE **9**

Turing Machine, definition, model, design of TM, Computable function, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines. Linear bounded automata and context sensitive languages.

UNIT V COMPUTABILITY THEORY **9**

Chomsky hierarchy of languages, linear bounded automata and context sensitive language,
LR (0) grammar, decidability of problems, Universal Turing Machine, decidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard Problems.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of the course, the students will be able to

- Explain the core concepts in automata theory and formal languages
- Identify the power and the limitations of regular languages
- Develop simple automata, regular expressions and context-free grammars
- Make use of Turing machines modeling for simple tasks
- Analyze the efficiency of the Computability theory

TEXT BOOKS:

1. John C. Martin, "Introduction to languages and the Theory of Computation", McGraw Hill, 4th Edition, 2011.
2. Sipser, "Introduction to Theory of Computation", Thomson, 2nd Edition, 2009.

REFERENCE BOOKS:

1. Kamala Krithivasan and Rama R, "Introduction to Formal languages Automata Theory and Computation", Pearson Education, 3rd Edition, 2011.
2. Daniel I.A.Cohen, "Introduction to Computer Theory", Pearson Education, 2009.
3. Lewis H.P., Panpadimition C.H., "Elements of Theory of computation", PHI, 3rd Edition, 2008.
4. Mishra, Chandrashekaran, "Theory of Computer Science-Automata Languages and Computation", PHI, 2nd Edition, 2010.

15UIT903	ARTIFICIAL INTELLIGENCE AND KNOWLEDGE ENGINEERING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To Study the concepts of Artificial Intelligence
- To Learn the methods of solving problems using Artificial Intelligence
- To Introduce the concepts of Expert Systems and Machine Learning

UNIT I INTRODUCTION **9**

Introduction - Definition - Future of Artificial Intelligence - Characteristics of Intelligent Agents - Typical Intelligent Agents - Problem solving Approach to Typical AI Problems.

UNIT II PROBLEM SOLVING METHODS **9**

Problem solving Methods - Search Strategies - Uniformed - Informed - Heuristics - Local Search Algorithms and Optimization Problems - Searching with Partial Observation - Constraint Satisfaction Problem - Constraint Propagation - Backtracking Search - Game Playing - Optimal Decisions in Games - Alpha—Beta Pruning - Stochastic Games.

UNIT III KNOWLEDGE REPRESENTATION **9**

First Order Predicate Logic - Prolog Programming - Unification - 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 IV MACHINE LEARNING **9**

Probability basics - Bayes Rule and its Application - Bayesian Networks - Exact and Approximate Inference in Bayesian Networks - Hidden Markov Models – Forms of Learning - Supervised Learning - Learning Decision Trees - Regression and Classification with Liner Models - Artificial Neural Networks - Nonparametric Models - Support Vector Machines - Statistical Learning - Learning with Complete Data - Learning with Hidden Variable - The EM Algorithm - Reinforcement Learning.

UNIT V APPLICATIONS **9**

AI Applications - Language Models – Information Retrieval - Information Extraction - Natural Language Processing - Machine Translation - Speech recognition - Robot - Hardwar - Perception - Planning - Moving.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Explain the concepts of AI methods.
- Choose appropriate AI methods to solve a given Problem.
- Identify the suitable knowledge representation for a given problem
- Apply the Machine Learning techniques.
- Develop simple applications using AI approaches.

TEXT BOOKS:

1. S.Russell and P.Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, 3rd Edition, 2008.
2. Elaine Rich, Kevin Knight, ShivashankarB.Nair, "Artificial Intelligence", Tata McGraw-Hill Education Pvt. Ltd, 3rd Edition, 2009

REFERENCE BOOKS:

1. David L.Poole, Alan K.Mackworth, "Artificial Intelligence: Foundations of Computational Agents", Cambridge University Press, 2010
2. EthemAlpaydin, "Introduction to Machine Learning(Adaptive Computation and Machine Learning Series)", The MIT Press; 2nd Edition, 2009
3. M.Tim Jones, "Artificial Intelligence: A Systems Approach (Computer Science)", Jones and Barlett Publishers, Inc; 1st Edition, 2008.
4. Nils J.Nilsson, "The Quest for Artificial Intelligence", Cambridge University Press, 2009.

15UIT904	DISTRIBUTED OPERATING SYSTEMS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To explain the evolution, system models and design issues in distributes OS
- To import a broader sense of knowledge in synchronization and memory concepts
- To demonstrate some insight in to the design of ATM networks and client server model

UNIT I INTRODUCTION TO DISTRIBUTED SYSTEMS 9

Fundamentals; Distributed computing system – Evolution – system models – distributed operating systems – Design issues.

UNIT II COMMUNICATION IN DISTRIBUTED SYSTEMS 9

Computer networks: Introduction – Network types – Communication protocols – ATM technology Group Communication, Remote procedure call, Case study: SUN RPC, DCE, RPC.

UNIT III SYNCHRONIZATION 9

Clock synchronization – Mutual exclusion – Election algorithms – dead locks, Case study; CHORUS

UNIT IV DISTRIBUTED SHARED MEMORY AND RESOURCE MANAGEMENT 9

Introduction to Distributed shared memory: Design and implementation issues – Structure of shared memory space – Consistency Models – heterogeneous DSM – Advantages of DSM, Introduction to Resource Management: Task assignment approach, Lord balancing approach, Load Sharing approach.

UNIT V DISTRIBUTED FILE SYSTEM AND SECURITY 9

Desirable features of a good distributed file system – File models – File accessing models – File sharing semantics – File Replication – Fault Tolerance – Atomic Transaction – Design Principles, security – Potential Attacks to Computer system – Authentication – Digital Signature – Design Principles.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Explain the issues in designing distributed operating systems
- Discuss various networking and communication technologies
- Examine the synchronization related issues in distributed systems
- Make use of the concepts of distributed shared memory and resource management
- Elaborate the process in distributed file systems and security aspects

TEXT BOOKS:

1. Pradeep K. Sinha, “Distributed operating systems: concepts and design”, PHI, 3red edition, 2012.
2. Coulouris, Jean Dollimore, Tim Kindberg, “Distributed System, Concepts and Design”, Addison Wesley, 5th edition, may 2011.

REFERENCE BOOKS:

1. Doreen L. Galli, “Distributed operating systems : concepts and practice”, Prentice Hall illustrated edition February, 2000.
2. Andrews S. Tanenbaum, Marteen Van Steen, “Distributed Systems Principles and Paradigms”, Pearson Edition, 2007.
3. M.L.liu, Distributed Systems Principles and applications”, Pearson Addison Wesley, 2004
4. MukeshSinghal, “Advanced Concepts in Operating Systems”, McGraw-Hill Series in Computer Science, 1994.

15UIT905	INTERNET OF EVERYTHING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand the basics of Internet of Things
- To get an idea of some of the application areas where Internet of Things can be applied
- To understand the middleware for Internet of Things
- To understand the concepts of Web of Things
- To understand the concepts of Cloud of Things with emphasis on Mobile cloud computing

UNIT I INTRODUCTION **9**

Definitions and Functional Requirements–Motivation–Architecture-Web3.0-View of IOT–Ubiquitous IOT Applications– Four Pillars of IOT– DNA of IOT-The Toolkit Approach for End-user Participation in the Internet of Things Middleware for IOT : Overview–Communication middleware for IOT–IOT Information Security

UNIT II IOT PROTOCOLS **8**

Protocol Standardization for IoT–Efforts–M2M and WSN Protocols–SCADA and RFID Protocols –Issues with IOT Standardization–Unified Data Standards–Protocols–IEEE802.15.4 –BAC Net Protocol–Mod bus– KNX–Zig bee Architecture–Network layer–APS layer– Security

UNIT III WEB OF THINGS **8**

Web of Things versus Internet of Things–Two Pillars of the Web–Architecture Standardization for WoT–Platform Middleware for WoT–Unified Multitier WoT Architecture–WoT Portals and Business Intelligence. Cloud of Things :Grid/SOA and Cloud Computing–Cloud Middleware–Cloud Standards–Cloud Providers and Systems–Mobile Cloud Computing–The Cloud of Things Architecture

UNIT IV INTEGRATION **7**

Integrated Billing Solutions in the Internet of Things Business Models for the Internet of Things-Network Dynamics: Population Models –Information Cascades-Network Effects–Network Dynamics: Structural Models-Cascading Behavior in Networks-The Small-World Phenomenon

UNIT V APPLICATIONS **13**

The Role of the Internet of Things for Increased Autonomy and Agility in Collaborative Production Environments Resource Management in the Internet of Things: Clustering, Synchronization and Software Agents. Applications - Smart Grid–Electrical Vehicle Charging

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Identify the functional requirements of IOT
- Analyze various protocols for IOT
- Designbusinessintelligence forWoT
- Build the integratedIOTapplications
- Analyzedifferent modelsfornetworkdynamics

TEXTBOOKS:

1. HonboZhou,"The Internet of Things in theCloud: A Middleware Perspective", CRC Press, 2012.
2. Dieter Uckelmann, MarkHarrison, Florian Michahelles, "Architecting the Internet ofThings", Springer, 2011.

REFERENCEBOOKS:

1. David Easley and Jon Kleinberg,"Networks, Crowds,and Markets: Reasoning About a Highly Connected World", Cambridge University Press,2010.
2. Olivier Hersent, Omar Elloumi and David Boswarthick, "The Internet of Things: Applications to the Smart Grid and Building Automation",Wiley,2012.
3. Olivier Hersent,DavidBoswarthick,Omar Elloumi,"The Internet of Things–Key applications and Protocols ",Wiley,2012.
4. Charalam posDoukas, "Building Internet of Things with the Arduinoll", Create space, April 2002

15UIT906	EMBEDDED SYSTEMS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To explain the basic structure of embedded system
- To familiarize with modern hardware / software tools for building prototypes of embedded systems
- To summarize the current statistics of embedded systems

UNIT I INTRODUCTION TO EMBEDDED COMPUTING 9

Complex systems and microprocessors – Embedded system design process – Design example: Model train controller – Instruction sets preliminaries – ARM Processor – CPU: Programming input and output supervisor mode, exceptions and traps – Co-processors – Memory system mechanisms – CPU

UNIT II EMBEDDED COMPUTING PLATFORM DESIGN 9

Components for embedded programs – Models of programs – Assemble, linking and loading – compilation techniques – Program level performance analysis – Software performance optimization – Program level energy and power analysis and optimization – Analysis and optimization of program size – Program validation and testing.

UNIT III PROCESS AND OPERATING SYSTEMS 9

Introduction – Multiple tasks and multiple processes – Multirate systems – Preemptive real-time operating systems – Priority based scheduling – Interprocess communication mechanisms – Evaluating Operating system performance-power optimization strategies for processes – Example Real time operating systems.

UNIT IV SYSTEM DESIGN TECHNIQUES AND NETWORKS 9

Design methodologies- Design flows – Requirement Analysis – Specifications – System analysis and architecture design – Quality Assurance techniques – Distributed embedded systems – MPSoCs and shared memory multiprocessors.

UNIT V CASE STUDY 9

Data compressor – Alarm Clock – Audio player – Software modem-Digital still camera – telephone answering machine-Engine control unit – Video accelerator.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course the student will be able to

- Describe the architecture and programming of ARM process and outline the concepts of embedded systems
- Explain the basic concepts of real time Operating system design.
- Use the system design techniques to develop software for embedded systems
- Evaluate embedded solutions for solving real world problems

TEXT BOOKS:

1. Marilyn wolf, “Computer as Components – principles of Embedded Computing system Design”, Morgan Kaufmann Publisher, Third edition, 2012.
2. Jonathan W. Valvano, “Embedded Microcomputer system Real Time Interfaceing”, Cengage Learning, Third edition, 2012.

REFERENCE BOOKS:

1. David.E. Simon, “An Embedded Software Primer”. Fifth Impression, 1st Edition, Addison Wesley Professional, 2007.

2. Raymond J.A. Buhr, Donald L. Bailey, “An Introduction to Real –Time systems – from Design to Networking with C/C++”, Prentice hall, 1st Edition, Addison Wesley Professional, 1999.

3. Krihna.C.M, Kang G. shin, “Real-Time Systems”, International Editions, Sixth Edition, McGraw Hill, 1997.

4. Prasad. K.V.K.K, “Embedded Real-Time Systems: Concepts, Design & Programming”. Dream Tech Press, Eight Edition, 2005.

15UIT907	NEXT GENERATION NETWORKS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To learn the technical, economic and service advantages of next generation networks.
- To learn the basic architecture of a next generation network (NGN) with reference and to understand NGN services
- To learn and compare the various methods of providing connection-oriented services over a NGN with reference to MPLS, MPLS-TE and to learn the various NGN virtual network services with reference to VPNs
- To learn multicast, optical networks and layer 2,3, services
- To learn the NGN management and the adaptive self healing networks.

UNIT I INTRODUCTION **9**

Evolution of public mobile services – motivations for IP based services, wireless IP network architecture – 3GPP packet data network architecture. Introduction to next generation networks – Changes, Opportunities and Challenges, Technologies, Networks, and Services, Next Generation Society, future Trends.

UNIT II IMS AND CONVERGENT MANAGEMENT **9**

IMS Architecture – IMS services – QoS control and Authentication – Network and service management for NGN – IMS advantage – Next Generation OOS Architecture: Importance to OSS Architecture – OSS Interaction with IMS and SuM – NGN OSS Function/Information View Reference Model – Designing Technology – Neutral Architectures – UML and Domain Specific Languages.

UNIT III MPLS AND VPN **9**

Technology overview – MPLS &QoS, MPLS services and components – layer 2 VPN, layer 2 internetworking, VPN services, signaling, layer 3 VPN – Technology overview, Remote Access and IP sec integration with MPLS VPN.

UNIT IV MULTICAST **9**

MPLS Multicast VPN overview – Applications, examples, IPv6 and MPLS – Technology overview, Future of MPLS-Integrating IP and optical networks, Future layer 3 services, future layer 2 services.

UNIT V NGN MANAGEMENT **9**

Network Management and Provisioning – Configuration, Accounting, performance, security, case study for MPLS, Future enhancements – Adaptive self healing networks.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful Completion of the course, the student will be able to

- Illustrate the principles of IMS and convergent management in nedt generation networks
- Compare various methods of providing connection – oriented services over a NGN with reference to MPLS, MPLS – TE and T-MPLS
- Compare various NGN virtual network services with reference to VPNs, VLANs, pseudo wires, VPLS and typical applications.
- Design routing mechanism meeting the desired QoS in NGN

TEXT BOOKS:

1. Thomas Plavyk, “Next generation Telecommunication Networks, Services and management”, wiley& IEEE Press Publications, 2012.
2. Monique J. Morrow, “Next Generation Networks”, CISCO Press, 2007.

REFERENCE BOOKS:

1. Neill Wikinson, “Next Generation Network services”, John wiley Publications, 2002.
2. Robert Wood, “MPLS and Next Generation Networks: Fundations for NGN and enterprise Virtualization”, CISCO Press, 2006.
3. Ina Minie, Julian Lucek, “MPLS enabled Applications – Emerging developments and new technologies”, wiley, 3rd edition, 2011.
4. Josef F. Huber, “Mobile Next Generation Networks”, IEEE Multimedia, Vol.11, Issue I, PP: 72-83, Jan-March 2004.

15UIT908	PARADIGMS IN GREEN COMPUTING	L	T	P	C
		3	0	0	3

COURSE :

PRE-REQUISITES:

COURSE OBJECTIVE:

- To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment
- Skill in energy saving practices in their use of hardware
- Tools that can reduce paper waste and carbon footprint by user, and to know how to minimize equipment disposal requirements.

UNIT I FUNDAMENTALS **9**

Green IT Fundamentals: Business, IT, and the Environment – Green computing: carbon foot print, scoop on power – Green IT Strategies: Drivers, Dimensions, and Goals – Environmentally Responsible Business: Policies, Practices, and Metrics.

UNIT II GREEN ASSETS AND MODELING **9**

Green Assets: Buildings, Data centers, Networks, and Devices – Green Business Process Management: Modeling, Optimization, and Collaboration – Green Enterprise Architecture – Environmental Intelligence – Green Supply Chains – Green Information Systems: Design and Development Models.

UNIT III GRID FRAMEWORK **9**

Virtualizing of IT systems – Role of electric utilities, Telecommuting, teleconferencing and teleporting – Materials recycling – Best ways for green PC – Green Data center – Green grid framework.

UNIT IV GREEN COMPLIANCE **9**

Socio – cultural aspects of green IT – Green Enterprise Transformation Roadmap – Green compliance: Protocols, Standards, and Audits – Emergent Carbon Issues: Technologies and Future.

UNIT V CASE STUDIES **9**

The Environmentally Responsible Business Strategies (ERBS) – Case study Scenarios for Trial Runs – Case studies – Applying Green IT Strategies and Applications to a Home, Hospital, Packaging Industry and Telecom Sector

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able t

- Explain various issues in Green Computing
- Utilize the importance of technologies that conform to low-power computation
- Use a range of tools to help monitor and design green systems
- Choose an appropriate way to make computing greener and more efficient
- Apply the Green IT strategies and application.

TEXT BOOKS:

1. BhuvanUnhelker, “Green IT Strategies and Application-Using Environmental Intelligence”, CRC Press, June 2011.
2. Woody Leonhard, Katherrine Murray, “Green Home computing for dummies”, Pearson Education India, 7th Edition, New Delhi, 2009.

REFERENCE BOOKS:

1. Alin Gales, Michael Schaefer, Mike Ebbers, “Green Data Center: steps for the Journey”, Shoff/IBM Rebook, 2011.
2. John Lamb, “The Greening of IT”, Pearson education, 2009.
3. Jason Harris, “Green Computing and Green IT – Best Practices on regulations & industry”, Pearson Education, 3rd Edition, 2008.
4. Carl speshocky, “Empowering Green Initiatives with IT, “John Wiley & Sons, 2010.

15UIT909	WIRELESS COMMUNICATION	L	T	P	C
		3	0	0	3

PRE-REQUISITES: 15UIT406 COMPUTER NETWORKS

COURSE OBJECTIVE:

- Know the characteristic of wireless channel
- Learn the various cellular architectures concepts
- Understand the concepts behind various digital signaling schemes for fading channels
- Be familiar with various multipath mitigation techniques
- Understand the various multiple antenna systems

UNIT I WIRELESS CHANNELS **9**

Large scale path loss – path loss models: Free Space and Two-Ray models – link Budget design – Small Scale fading – Parameters of mobile multipath channels – Time dispersion parameters – Coherence bandwidth – Doppler spread & Coherence time, Fading due to Multipath time delay spread – flat fading – frequency selective fading – Fading due to Doppler spread – fast fading – slow fading.

UNIT II CELLULAR ARCHITECTURE **9**

Multiple Access techniques – FDMA, TDMA, CDMA – Capacity calculations – Cellular concept – Frequency reuse – channel assignment – hand off – interference & system capacity – trunking& grade of service – Coverage and capacity improvement.

UNIT III DIGITAL SIGNALING FOR FADING CHANNELS **9**

Structure of a wireless communication link, Principles of Offset – QPSK, p/4-DQPSK, minimum Shift Keying, Gaussian Minimum shift Keying, Error performance in fading channels, OFDM principle – Cyclic prefix, Windowing, PAPR.

UNIT IV MULTIPATH MITIGATION TECHNIQUES **9**

Equalization – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms. Diversity – Micro and Macro diversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver.

UNIT V MULTIPLE ANTENNA TECHNIQUES **9**

MIMO systems – spatial multiplexing – System model – Pre-coding – Beam forming – transmitter diversity, receiver diversity – Channel state information – capacity in fading and non-fading channels.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Classify the different fading techniques
- Choose the appropriate multiple access techniques for fading channels
- Compare multipath mitigation techniques and analyze their performance
- Design MIMO systems with transmit/receive diversity

TEXT BOOKS:

1. Rappaport, T.S., “Wireless communications”, Pearson education, 2nd Edition, 2010
2. Andreas. F. Molisch, “Wireless Communications”, John Wiley – India, 2006.

REFERENCE BOOKS:

1. David Tse and PramodViswanath, “Fundamentals of Wireless Communication”, Cambridge University Press, 2005.
2. UpenaDalal, “Wireless Communications”, Oxford University Press, 2009.
3. Van nee, R. and Ramji Prasad, “OFDM for wireless multimedia communications”, Artech House, 2000.
4. Jochen Schiller, “Mobile Communication”, Pearson Education Asia Ltd., 2nd, 2008

15UIT910	BUILDING ENTERPRISE APPLICATIONS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To familiarize functional / nonfunctional requirements, business scenario and document the use case diagrams in the given template
- To demonstrate logical architecture for the given business scenario documented in use case diagrams
- To import data architecture for the given logical architecture

UNIT I INTRODUCTION 8

Introduction to enterprise applications and their type, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications.

UNIT II DESIGN PHASE 9

Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, nonfunctional requirements, requirements validation, planning and estimation.

UNIT III ARCHITECTURE DESIGN 10

Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture- design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations, Infrastructure architecture and design elements – Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design.

UNIT IV IMPLEMENTATION METHODOLOGIES 9

Construction readiness of enterprise applications – defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage.

UNIT V VALIDATION 9

Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the knowledge of software engineering methodologies in the development of an enterprise application.
- Build the requirement analysis for an enterprise with consideration for public health, sate same environment conditions.
- Formulate an architectural design for a new enterprise application importance of application framework and designing component.
- Apply the appropriate technique to perform code review and code analysis.

TEXT BOOKS:

1. Anubhav Pradhan, sathneesha B. Nanjappa, senthil K. Nallasamy, VeerakumarEsakimuthu" Raising Enterprise Applications", John wiley.
2. Brett Mc Laughlin, "Building Java Enterprise Application", O'Reily Media.

REFERENCE BOOKS:

1. Soren Lauesen, "Software Requirements: styles & Techniques", Addison-Wesley Professional, 2002.
2. Brian Berenbach, "Software Systems Requirements Engineering: In Practice", McGraw-Hill/Osborne Media, 2009.
3. Dean LEffingwell, Don Widrig, "Managing software Requirements: A Use Case Approach", Pearson education, 2003.

15UIT911	SOFTWARE TESTING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand completed software testing life cycle
- To demonstrate understanding of various terms and technologies used in testing domain.
- To demonstrate understanding of usage of testing framework, process and test management

UNIT I TESTING BASICS 8

Testing as an engineering activity-Role of process in software quality-Testing as a process- basic definitions- software testing principles- the tester's role in a software development organization-Origins of defects- Defect classes - the defect repository and test design- Defect examples-Developer/ Tester support for developing a defect repository

UNIT II TEST CASE DESIGN 11

Introduction to testing design strategies- The smarter tester- Test case design strategies- Using black box approach to test case design- Random testing - Equivalence class Partitioning- Boundary value analysis- other black box test design approaches- Black box testing and COTS - Using white box approach to test design- Test adequacy criteria-Coverage and control flow graphs- covering code logic- Paths - Their role in white box based test design- Additional white box test design approaches- Evaluating test adequacy criteria

UNIT III EXECUTION OF ADEQUACY TEST 8

Life Cycle - Based Testing - Model- Based testing - Integration Testing- system Testing- Object Oriented Testing- Model- Based Testing for systems of Systems- Exploratory Testing

UNIT IV BASICS OF AUTOMATION TESTING 9

ATLM-ATLM's Role in the Software Testing Universe-Software Testing Careers Decision to Automate Test- Automated Test Tool Evaluation and Selection- Test Team Management

UNIT V TESTING APPLICATIONS 9

Testing Internet Applications-Basic E-Commerce Architecture- Testing Challenges- Testing Strategies- Mobile Application Testing-Testing Approaches-Sample Extreme Testing Application

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Illustrate the software testing principles and its defects
- Develop test cases to exercise a software
- Compare the levels of Testing
- Make use of Automated testing tools
- Demonstrate and Understanding of testing applications

TEXT BOOKS:

1. Paul c.Jorgesen, "Software Testing : A Craftsma'sApproch" 4th Edition, CRC Press, 2013
2. Elfriede Dustin, "Implementing Automated Software Testing: How to Save time and Lower Costs While Raising quality", 1st Edition, Addison-Wesley Professiona, 2009
3. Dorothy Graham, Erik van Veenendaal, Isabel Evans, Rex Black, "Foundations of software testing", John Wiley & Sons, 2012.

REFERENCE BOOKS:

1. Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing - Principles and Practices", Person Education, 2006.
1. GlenfordJ.Myers, TomBadgett, Corey Sandler, " The art of Software Testing", 3rd Edition, John Wiley & sons publicaiton 2012
2. Boris Beizer, “SoftwareTesting Techniques", Second Edition, Dreamtech, 2003.
3. IlenceBurnstein, "Practical Software Testing", Springer International Edition, 2003

15UIT912	ADHOC AND SENSOR NETWORKS	L	T	P	C
		3	0	0	3

PRE-REQUISITES: 15UIT909 WIRELESS COMMUNICATION

COURSE OBJECTIVE:

- To explain mobile adhoc networks, design, implementation issues, routing and clustering mechanism
- To import the 802.11 Wireless Lan (Wifi) and Bluetooth standards
- To demonstrate designing and implementing adhoc network functionality using network simulation tools and Pocket PCs

UNIT I INTRODUCTION TO ADHOC NETWORKS 9

Introduction to Wireless communication Technology – Characteristics of the Wireless Channel – IEEE 802.11a/b Standard – Origin of Adhoc Packet Radio Networks – Architecture of PRENETs – Introduction to Adhoc Wireless Networks – Heterogeneity in Mobile Devices.

UNIT II ADHOC NETWORK ROUTING PROTOCOLS 9

Introduction to designing a Routing Protocol – Classifications of Routing Protocols – Wireless Routing Protocol (WRP) – Source – Initiated On- Demand Approaches – Adhoc On-Demand Distance Vector Routing (AODV) – Introduction to Multicast Routing Protocol – Classifications of Multicast Routing Protocols.

UNIT III QOS AND ENERGY MANAGEMENT 9

Introduction to QoS in Adhoc Wireless Networks – Classifications of QoS Solutions – Classification of Energy management Schemes – Transmission Power Management Schemes – System Power management Schemes.

UNIT IV INTRODUCTION TO WIRELESS SERSOR NETWORKS 9

Introduction – Characteristic requirements – Challenges of sensor networks – emerging technologies for wireless sensor networks – Advantages of sensor networks – sensor network applications.

UNIT V WSN PROTOCOLS 9

Communication protocols – MAC protocols – Naming and Addressing – Routing Protocols – Energy efficient routing.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Explain the concept of adhoc sensor networks and their architecture
- Analyze various routing protocol design in adhoc networks
- Compare the various energy management schemes in ad hoc networks
- Recognize the efficiency of power and energy required for adhoc sensor network
- Analyze the performance of routing protocols for sensor networks

TEXT BOOKS:

1. Siva Ram Murthy C, Manojb.s, "Adhoc Wireless Networks Architectures and Protocols", Pearson Education, 7th Edition, 2007.
2. Feng Zhao, Leonidas J. Guibas, "wireless Sensor Networks – An Information Processing Approach", Elsevier, 1st Edition, 2007.
3. Holger Kari, Andreas willing, "Protocols and Architectures for wireless sensor networks", John Wiley, 2nd Revised Edition, 2011.

REFERENCE BOOKS:

1. Toh.C.K, "AdhocMobille Wireless Networks, Protocols and Systems", Pearson Education, 2nd Edition, 2009.
2. AzzendineBoukerche, "Handbook of algorithms for Wireless Networking and Mobile Computing", CRC Press, 2ndEidtion, 2006.
3. Charles E.Perkins, "Ad Ho c Networking", Addison Wesley, international Edition, 2000.
4. KazemSohraby, Daniel Minoli, TaiebZnati, "Wireless Sensor Networks Technology, Protocols, and Applications", John Wiley, 2nd Edition, 2007.
5. Anna Hac. "Wireless Sensor Network Designs", John Wiley, 2nd Edition, 2003.

15UIT913	DATABASE ADMINISTRATION AND TUNING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:15UIT405 DATABASE MANAGEMENT SYSTEMS

COURSE OBJECTIVE:

- To realize the importance of backup and recovery mechanisms
- To study the indexing mechanisms for organizing data
- To learn to troubleshoot database issues
- To understand the need for time series and distributed databases

UNIT I ADMINISTRATION 9

Introduction to network administration: Network design considerations, network responsibilities for the DBA, network configuration, Overview of oracle net features, Oracle Net Stack Architecture, Data Warehouse Administration.

UNIT II BACKUP, RECOVERY, PERFORMANCE AND SECURITY 9

Database backup and Recovery – Importance – Alternatives to backup and recovery – Disaster Planning – The Need – Guidelines – Backing up the database for disaster recovery – Disaster Prevention – System Performance – Database Performance – Techniques for optimizing databases – Database reorganization –Database security – Regulatory compliance and database administration.

UNIT III INDEX TUNING 9

Types of queries – Data structures – B tree – B+ tree – Hash structures – Bit map indexes- clustering indexes – non clustering indexes – Composite indexes – Hot tables – Comparison of indexing and hashing techniques.

UNIT IV TROUBLESHOOTING 9

Query plan explainers – performance monitors – Event monitors – Finding “Suspicious” Queries – Analyzing a Query’s access plan – profiling a query execution – DBMS subsystems

UNIT V CASE STUDIES 9

Transaction chopping – Time series databases – Understanding access plans – Configuration parameters: Oracle; SQL server; DB2 UDB- distributed database – Implementation.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Build a data warehouse
- Comprehend the importance of backup and recovery mechanism
- Compare various indexing mechanism to make effective retrieval from database
- Analyze the performance of query execution
- Design a simple application using database tuning

TEXT BOOKS:

1. Date. C.J, Kannan. A, Swamynathan. S, “An Introduction to Database Systems”, Pearson Education, 8th Edition, 2006.
2. Dennis Shasha, Philippe bonnet’, Database Turing, Principles, Experiments, and Troubleshooting Techniques’, Elsevier Reprint, 1st Edition, 2005.
3. Budi Darmawan, Gary Groenewald, Allanlrving, “Database Performance Tuning on AIX”, IBM, 1th Edition, 2003.

REFERENCE BOOKS:

1. Craig S. Mullins, “Database Administration: The Complete Guide to DBA Practices and Procedures”, Addison Wesley, 2nd Edition, 2012.
2. Steve Fogel, “Oracle Database Administrator’s Guide, 11g Release 2 (11.2)”, Oracle, 1st Edition, 2015.
3. Thomas Connoly, CarlolynBegg, “Database Systems, APractical Approach to Design, Implementation and Management”, Pearson Education, 4th Edition, 2009.
4. M. TamerOzsu, Patrick Valduriez, S.Sridhar, “Principles of Distributed Database Systems”, Springer, 3rd Edition, 2011.

15UIT914	DATA ANALYTICS	L	T	P	C
		2	0	2	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand the basic concepts of big data, methodologies for analyzing structured and unstructured data
- To understand the basic of big data and analytics and Hadoop.
- To be able to analyze the various technologies & tools associated with Big Data

UNIT I UNDERSTANDING BIG DATA **8**

Definition of big data – Uses big data – Characteristics of big data – Challenges with big data – Technology Landscape – Big Data Analytics – Analytics 1.0, analytics 2.0, Analytics 3.0 – Big Data technology Landscape – NoSQL Databases – NoSQL Vs. RDBMS – New SQL – Hadoop – Hadoop 1.0, vs. Hadoop 2,0.

UNIT II INTRODUCTION TO HADOOP **10**

Hadoop Overview – Hadoop Distributed File System – Processing Data With Hadoop – Managing Resources and Applications with Yarn – Introduction to Mongodb

UNIT III HADOOP RELATED TOOLS **12**

Hbase – data model and implementations – Hbase clients – Cassandra – Cassandra data model – Cassandra clients – Pig – Grunt – pig data model – Pig Latin – developing and testing Pig Latin scripts. Hive – data types and file formats – HiveQL data definition – HiveQL data manipulation – HiveQL queries – Introduction to Jasper Report.

List of Experiments: **30**

1. Data structures in Java: Linked List, Stacks, Queues, Sets, Maps.
2. Install the Hadoop in standalone mode.
3. Implement the frequently used Hadoop shell commands.
4. Running a WordcountMapreduce example in Hadoop 2.4.1 Single-node Cluster in Ubuntu 14.04 (64-bit)
5. Write the Map reduce program for Weather Dataset.
6. Install the Apache Pig
7. Implement the Apache Pig Latin scripts on
    - Describe Operator
    - Basic Grunt shell commands
    - For each operator
    - Order By operator
8. Install the Hive.
9. Execute Hive Scripts and Implement Hive Script in Java

TOTAL: 60 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Explain big data and use cases from selected business domains.
- Analyze, Install, configure, and run Hadoop and HDFS.
- Perform map-reduce analytics using Hadoop.
- Apply hadoop related tools such as Hbase, Cassandra, pig, and hive for big data analytics.

TEXT BOOKS:

1. Michael Minelli, Michelle Chambers, and AmbigaDhiraj, “Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today’s Business”, Wiley Edition, 2013.
2. P. J. Sadalage and M. Fowler, “NoSQL Distilled: A Brief Guide to the Emerging World of polyglot Persistence”, Addison-Wesley Professional, 2012.

REFERENCE BOOKS:

1. Tom White, “Hadoop: The Definitive Guide”, Third Edition, O’Reilley, 2012.
2. Eric Sammer, “Hadoop Operations”, 3rd Edition, O’Reilley, 2012.
3. E. Capriolo, D. Wampler, and J. Rutherglen, “Programming Hive”, 3rd Edition, O’Reilley, 2012.
4. Lars George, “HBase: The Definitive Guide”, 3rd Edition, O’Reilley, 2011.

15UIT915	SYSTEM SOFTWARE INTERNALS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To know the design and implementation of assemblers.
- To know the design and implementations of linkers and loaders.
- To introduce the phases of operation of a compiler
- To familiarize the design and implementation of a lexical analyzer and parser
- To demonstrate the code generation and optimization

UNIT I ASSEMBLERS AND MACROS 8

Overview of Language processors – Assemblers: design of two pass assemblers – single pass assemblers MACRO: Macro definition – macro call – macro expansion – nested macro – advanced macro facilities- Design of Macro processor

UNIT II LOADERS AND LINKERS 10

Basic loader functions – Design of an absolute Loader – A Simple Bootstrap Loader – Machine dependent loader features – Relocation – Program Linking – Algorithm and Data Structures for Linking Loader – Machine – independent loader features – Automatic Library Search – Loader Options – Loader design options – Linkage Editors – Dynamic Linking – Bootstrap Loaders – Implementation example – MSDOS linker

UNIT III LEXICAL ANALYSIS AND SYNTAX ANALYSIS 9

Introduction to Compiling – The phases – Cousins – The grouping of phases The role of the lexical analyzer – Syntax Analysis – The role of the parser – Context-free grammars – Writing a grammar – Top down parsing – Bottom-up Parsing – LR papers – Constructing an SLR(1) parsing table

UNIT IV INTERMEDIATE CODE GENERATION 9

Intermediate languages – Declarations – Assignment statements – Boolean expressions – Case statement – Back patching – Procedure calls.

UNIT V CODE GENERATION AND OPTIMIZATION 9

Issues in the design of a code generator – The target machine – Run-time storage management – Basic blocks and flow graphs – A simple code generator – Introduction – The principle sources of optimization

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Discuss the Assembler and Macros concepts
- Design the Loaders and Linkers
- Describe the principles of a Complier
- Generate intermediate code
- Evaluate the code optimization techniques

TEXT BOOKS:

1. Leland L. Beck, “System Software – An Introduction to Systems Programming”, Pearson Education Asia, 3rd Edition, 2000.
2. Alfred V. Aho, Ravi Sethi Jeffrey, D. Ullman, “Compilers – Principles, Techniques, and Tools Pearson Education Asia, 1st Edition, 2007..

REFERENCE BOOKS:

1. John J. Donovan, “Systems Programming”, Tata McGraw-Hill Edition, 2nd Edition 1972.
2. John R. Levine, “Linkers & Loaders”, Morgan Kaufmann Publishers, Harcourt India Pvt. Ltd., 1st Edition 2000.
3. Raghavan “Principles of Complier Design”, Tata Mc-Graw Hill Education, 2010.
4. David Galles, “Modern Complier Design”, Pearson Education Asia, 2007.

15UIT916	INTELLIGENT AGENTS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the basic concepts of software agents and its characteristics
- To import the significance of agent classifications, Models/architectures and the Methods used for communication
- To review avenues of Intelligent agent based applications

UNIT I INTRODUCTION 8

Agents as tools of the information society – Intelligent Software Agents – Agents in Business Area – Agents in Private Area – Definition of intelligent software agents – characteristics.

UNIT II AGENT CLASSIFICATION 9

Agent classification – Areas of Influence – Artificial Intelligence – Distributed AI Network Communication System – Architecture – Deliberative and Reactive Agents stationary and Mobile Agents – RPC – Remote programming advantage and Disadvantage of Mobile Agents

UNIT III AGENT MODELING 10

Technical Implementations –Software Architecture of Mobile agent system – Layers of base software for mobile agents – functions of agent layer communication flow between agent and agent layer – Mullers agent architecture – Brooks Subsumption Architecture – conceptual interrap agent model – interrap agent architecture – architecture – agent learning models Architecture.

UNIT IV AGENT COMMUNICATION 8

Multi – Agent Systems – Communication and Cooperation in Multi-Agent systems – distributed Problem solving – Communication Methods – Black board systems – Extended black board structure – message passing – Cooperation Protocols.

UNIT V APPLICATIONS OF AGENTS 10

Development methods and Tools –Agent Oriented Analysis and Design – Object oriented Analysis – Agent Oriented Methods – Agent languages – Applications areas for software Intelligent Agents – Information Retrieval and Filtering – News watcher – Entertainment – Agent based applications on data mining, Image processing and wireless sensor networks.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Explain the intelligent software agent and their characteristics
- Identify the appropriate agents for an application
- Develop a simple agent modeling for an application
- Illustrate various agent communication protocols
- Design Agent Base applications

TEXT BOOKS:

1. Walter Brenner, RudigerZarnekow, Hartmutwittig Claudia Schubert, “Intelligent Software Agents foundations and applications” Springer, 1st edition, 1998.
2. Jacques Ferber, “Multi-Agent System: An Introduction to Distributed Artificial Intelligence Addison Wesley, 1st edition, 1999.

REFERENCE BOOKS:

1. Jeffrey M. Bradshaw, “Software Agents”, Copyright ©American Association of Artificial Intelligence AAAI Press the MIT Press, 1st edition,1997
2. Lin Padgham and Michael Winikoff,” developing intelligent Agent Systems A Practical”, John Wiley and Sons, 1st Edition, 2004.
3. Joseph P Bigus, Jennifer Bigus, “Constructing intelligent Agents with java A Programmers Guide to Smarter Applications”, Paperback, wiley computer publishing, 1st edition 1997.
4. Kerstin Dautenhahn, Alan H. Bond, Lola Canamero, Bruce Edmonds, “Socially intelligent Agents Creating Relationships with computers and Robots”, Kluwer Academic Publisher, 1st Edition, 2002.

15UIT917	ENTERPRISE ARCHITECTURES	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Describe approaches to enterprise application integration
- Understand the integration middleware
- Evaluate the integration approaches suitable for a given problem

UNIT I INTRODUCTION **8**

Requirements for EAI- Challenges in EAI- Integration with legacy systems- Integration with partners- Heterogeneous environment- Implementation approaches- Web services, messaging, ETL, direct data integration- Middleware requirements- Approaches to integration- services oriented and messaging.

UNIT II INTEGRATION PATTERNS **8**

Introduction to integration patterns- Architecture for application integration- integration patterns-Point to point, broker, message bus, publish/subscribe, challenges in performance, security, reliability- Case studies.

UNIT III SERVICE ORIENTED INTEGRATION **10**

Business process integration - Composite applications-services-Web services- Service choreography and orchestration- Business process modeling-BPMN, Business process execution -BPEL- Middleware infrastructure-Case studies.

UNIT IV MESSAGING BASED INTERGRATION **9**

Messaging- Synchronous and asynchronous- Message structure- Message oriented middleware- Reliability mechanisms- Challenges- Messaging infrastructure- Java Messaging Services- Case studies.

UNIT V ENTERPRISE SERVICE BUS **10**

Enterprise service Bus- routing, scalable connectivity, protocol and message transformations, data enrichment, distribution, correlation, monitoring-Deployment configurations- Global ESB, Directly connected, Federated, brokered ESBs- Application server based- Messaging system based- Hardware based ESBs- Support to SOA, Message based and event based integrations- Case studies.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Explain different approaches to integration enterprise applications
- Analyze specifications and appropriate integration approaches
- Develop a suitable service oriented integration design for a given problem
- Identify appropriate integration middleware for a case study
- Apply suitable deployment configuration for a given enterprise service bus

TEXT BOOKS:

1. George Mentzas, Andreas Frezen (Eds), " Semantic Enterprise Application Integration for Business Processes: Service- oriented Frameworks", Business Science Reference. USA. 2010.
2. Waseem Roshen, "SOA Based Enterprise Integration", Tata McGrawHill, 1st Edition, 2009.

REFERENCE BOOKS:

1. G. Hohpe and B woolf, "Enterprise Integration patterns: Designing, Building and Deploying Messaging Solution", Addison- Wesley professional, 3 rd Edition, 2003.
2. D Linthicum, " Next Generation Application integration: From Simple information to Web Services", Addison-Wesley, 1st Edition, 2003.
3. Martin fowler, "Patterns of Enterprise Application Architecture", Addison-Wesley, 1st Edition, 2003.
4. Kapil Pant and MatiazJuric, "Business Process Driven SOA using BPMN and BPEL: From Business Process Modeling to Orchestration and Service Oriented Architecture:.Packt Publishing, 1st Edition. 2008.

15UIT918	DATABASE TECHNOLOGY	L	T	P	C
		2	0	2	3

PRE-REQUISITES:15UIT405 DATABASE MANAGEMENT SYSTEMS

COURSE OBJECTIVE:

- To familiar with a commercial relational database system
- To understand the relational database theory
- To expose various databases

UNIT I PARALLEL AND DISTRIBUTED DATABASES 10

Database System Architectures: Centralized and Client-server Architectures-Server System Architectures - Parallel Systems- Distributed systems- Parallel Databases: I/O parallelism- Inter and intra Query Parallelism- Inter and Intra operation Parallelism- Distributed Database Concepts- Distributed Data Storage- Distributed Transactions- Commit Protocols- Concurrency control- Distributed Query processing.

UNIT II OBJECT AND OBJECT RELATIONAL DATABASES 10

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

UNIT III XML DATABASES AND MOBILE DATABASES 10

XML Databases: XML Data Model - DTD - XML Querying- Web Databases- JDBC - Information Retrieval- Mobile Database: Location and Handoff Management - Effect of Mobility on Data Management- Location Dependent Data Distribution- Mobile Transaction Models.

List of Experiments30

Distributed Database

Consider a distributed database for a bookstore with 4 sites called S1, S2, S3 and S4, Consider the following relations.

- Books (ISBN, primary Author, topic, total Stock, price)
- Book Store (store no, city, state, zip, inventory value)
- Stock (store no, ISBN, Qty)

Total Stock is the total number of books on stock and inventory value is the total inventory value for the store in dollars.

1. Consider that books are fragmented by price amounts into:
   F1: Books : price up to $20
   F2: Books: price from $20.01 to $50
   F3: Books: price from $50.01 to$100
   F4: Books: price $100.01 and above

Write SQL Query for the following

i. insert and Display details in each table.
ii. Find the total number of books in stock where price is between $15 and $55.

2. Consider that book Stores are divided by ZIP codes into:

S1: Bookstore: Zip up to 25000
S2: Book store: Zip 25001 to 50000
S3: Book store: Zip 50001 to 75000
S4: Book store: Zip 75001 to 99999

Write SQL Query for the following

i. Update the book price of book No= 1234 from $ 45 to $55 at site S3
ii. Find total number of book at site S2.

Object oriented Database:

A University wants to track person associated with them. A person can be an Employee or Student. Employees are Faculty, Technicians and Project associates. Students are Full time students, Part time students and Teaching Assistants.

3. Design an Enhanced Entity Relationship (EER) Model for university database. Write OQL for the Following.
   i. Insert details in each object
   ii. Display th employee details.
4. Design an Enhanced Entity Relationship (EER) Model for university database. Write OQL for the following
   i. Display student Details.
   ii. Modify person details.
   iii. Delete Person details.

PARALLEL DATABASE

5. Consider the application for university Counseling for Engineering Colleges. The college, Department and vacancy details are maintained in 3 sites. Students are allocated colleges in these 3 sites simultaneously, Implement this application using parallel database [State any assumptions you have made].
6. There are 5 processors working in a parallel environment and producing output. The output record contains college details and students mark information. Implement parallel join and parallel sort algorithms to get the marks from different colleges of the university and publish 10 ranks for each discipline.

XML

Design XML Schema for the given company database.

Department (deptName, deptNo, deptManager SSN, deptManagerStartDate, deptLocation)

Employee (empname, empSSN, empSex, empSalary, empBirthDate, empDeptNo, empSupervisorSSN, empAddress, empWorksOn)Project (projName, projNo, projLocation, projDeptNo, projWorker)

7. Implement a storage structure for storing XML database and test with the above schema.
8. Create applications using Triggers.
9. Create application using Temporal/Deductive/Knowledge database.
10. Develop an application using mobile database.

TOTAL: 60PERIODS

COURSE OUTCOMES:

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

- Explain the Parallel and distributed databases for an application
- Design an application using object relational databases
- Construct an XML database
- Create a mobile database
- Compare various intelligent databases.

TEXT BOOKS:

1. Henry F Korth, Abraham Silberschatz and Sudharshan. S, "Database System Concepts", McGraw Hill, 6th Edition, 2011.
2. Date. CJ, Kannan. A and Swamynathan. S, "An Introduction to Database Systems", Pearson Education, 8th Edition, 2006.
3. Elmasri. R, Navathe. S.B, "Fundamentals of Database Systems", Pearson Education, 5th Edition, 2007.
4. Thomas cannolly and Carolyn Begg, "Database Systems. A Practical Approach to Design, Implementation and Management", Pearson Education, 3rd Edition, 2007.
5. Subramaniam, "Multimedia Databasese", Morgan Kauffman Publishers, 2008.

REFERENCE BOOKS

1. Raghu Ramakrishnan, "Database Management Systems", Tata McGraw Hill, 3rd Edition, 2003.
2. Singh. S.K, "Database Systems Concepts, Design and Applications", Pearson Education, 1st Edition, 2006.
3. Hector Garcia-Molina, Jeffrey Ullman. D, Jennifer Widom, "Database systems: The complete Book", Pearson Education, 4th Edition, 2009.

15UIT919	FREE AND OPEN SOURCE SOFTWARE	L	T	P	C
		2	0	2	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To demonstrate GNU/Linux Architecture and Linux Distributions
- To explain the File Handling and Graphics Tools
- To import the Linux web Server using LAMP

UNIT I GNU/LINUX ARCHITECTURE AND DEVELOPMENT TOOLS 10

GNU/Linux Architecture, Architectural breakdown of Major Kernel components, Linux distributions GNU Compiler Tool Chain, Building Software with GNU Make, Make file constructs. Static- Shared-Dynamic Libraries, Building Packages with Auto make/ Auto conf

UNIT II FILE HANDLING TOOLS AND GRAPHICS TOOLS 10

File Handling- API- Character access mechanisms, String access mechanisms, Sequential and Random access methods, Graphics File Formats, Diagramming with Dia, Open Office Draw, GIMP

UNIT III TEXT PROCESSING TOOLS 10

Bash beginnings, Pathnames and Permissions, Useful elements, cron job, Script Versions Text processing with awk and sed scripts.

Lab Experiment 30

1. Kernel configuration, compilation and installation
2. Virtualization environment
3. Installing Various software packages
4. Write user space drivers using fuse
5. GUI programming
6. Version control system setup and usage
7. Text processing with Perl
8. Running PHP
9. Running Python
10. Set up the complete network interface

TOTAL: 60PERIODS

COURSE OUTCOMES:

After the Successful Completion of the course students will be able to

- Discuss the architecture and tools for FOSS development
- Explain deployment tools
- Build tools for file handling, graphics and text processing
- Choose an appropriate methods to process text
- Apply various standards, copyright issues and licenses for FOSS

TEXT BOOKS:

1. Tim Jones. M, "GNU/Linux Application Programming", Dream Tech press, 1st Edition, 2005.
2. Karl Fogel, "Producing Open Source Software", O Reilly Media Inc, 1st Edition, 2005.

REFERENCE BOOKS:

1. Tom Adelsteiln, Bill Lubanovic, "Linux System Administration", OReily, 4th Edition, 2007.
2. Richard Petersen "Red Hat Enterprise Linux 6: Desktop and Administration", Surfing Turtle press, 1st Edition, 2011.
3. Janet Valade, "Spring into Linux", Pearson Education, 1st Edition, 2006.Ellie Quigley, "PERL by Example", pearson Education, 1st Edition, 2007.

15UIT920	WEB MINING AND SOCIAL NETWORKING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:15UIT601 Data Warehousing and Data Mining

COURSE OBJECTIVE:

- To introduce the concept of semantic web and related applications
- To explain the knowledge representation using ontology
- To review human behavior in social web and visualization of social networks

UNIT I INTRODUCTION 10

Introduction to Semantic Web: Limitations of current Web – Development of Semantic Web – Emergence of the Social Web – Social Network analysis: Development of Social Network Analysis – Key Concepts and measures in network analysis – Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities – Web based networks – Applications of Social Network Analysis.

UNIT II MODELLING, AGGREGATING AND KNOWLEGE REPRESENATATION 8

Ontology and their role in the Semantic Web: ontology – based knowledge Representation – ontology languages for the Semantic Web: Resource Description Framework – Web Ontology Language –Modeling and aggregating social network data: State-of –the-art in network data representation – Ontological representation of social individuals - Ontological representation of social relationships- Aggregating and reasoning with social network data – Advanced representations.

UNIT III EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS 9

Extracting evolution of Web Community from a Series of Web Archive – Detecting communities in social networks – Definition of community – Evaluating communities – Method for community detection and mining – Applications of community mining algorithms – Tools for detecting communities social network infrastructures and communities – Decentralized online social networks – Multi -Relational characterization of dynamic social network communities.

UNIT IV PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES 9

Understanding and predicting human behavior for social communities – User data management – Interface and Distribution – Enabling new human experiences – Reality mining – Context – Awareness – Privacy in online social networks – Trust in online environment – Trust models based on subjective logic – Trust network analysis – Trust transitivity analysis – Combining trust and reputation – Trust derivation based on trust comparisons – Attack spectrum and counter measures.

UNIT V VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS 9

Graph theory – Centrality – Clustering – Node – Edge Diagrams – Matrix representation – Visualizing online social networks, Visualizing online social networks Visualizing social networks with matrix-based representations – Matrix and Node - Link Diagrams - Hybrid representations - Applications – Cover networks – Community welfare – Collaboration networks – Co-Citation networks.

TOTAL: **45PERIODS**

COURSE OUTCOMES:

After the successful completion of the course, the students will be able to

- Explain the core concepts of social network analysis
- Develop semantic web related applications
- Make use of methods for web community detection and mining in social networks
- Analyze human behavior in social web and related communities
- Apply the visualization techniques to social networks

TEXT BOOKS

1. Peter Mika, "Social Networks and the Semantic Web", Springer, 1st Edition, 2007.
2. BorkoFurht, "Handbook of Social Network Technologies and Applications", Springer, 1st Edition, 2010.

REFERENCE BOOKS

1. GuandongXu, Yanchun Zhang, "Web Mining and social Networking – Techniques and Applications", Springer, 1st Edition, 2011.
2. Dion Goh, Schebert FOO, "Social information Retrieval systems: Emerging Technologies and Applications for Searching the Web Effectively", IGI Global Snippet, 1st Edition, 2008.
3. Max Chevalier, Christine Julien, Chantal Soule-Dupuy," Collaborative and Social Information Retrieval and Access: "Techniques for improved user Modelling", IGI Global Snippet, 1st Edition, 2008.
4. John G. Breslin, John G. Breslin, StefanDeckar, "The Social Semantic Web", Springer, 1st Edition, 2011.

15UIT921	ETHICAL HACKING AND INFORMATION FORENSICS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:15UIT501 CRYPTOGRAPHY AND NETWORK SECURITY

COURSE OBJECTIVE:

- To learn various hacking techniques and attacks
- To known how to protect information assets against various hacking
- To perform penetration tests into secure networks for evaluation purposes
- To understand information analysis associated with the nature of forensics

UNIT I FUNDAMENTALS OF HACKING 9

Fundamentals of Computer Fraud – Threat concepts – Framework for predicting inside attacks – Types of Data Stolen – Authenticity and Non-Repudiation – Security Challenges – Effects of Hacking – Hacker and Types of Hacker – Ethical Hacker – Hacktivism – Attacks on Networks and Computers – Malicious Software(Malware) – Protection Against Malware, Intruder – Key Loggers and Back Doors.

UNIT II FOOT PRINTING 9

Web Tools for Foot Printing – Conducting Competitive intelligence – Google Hacking – Scanning, Enumeration – Trojans & Backdoors – Virus & Worms, Proxy & Packet Filtering – Denial of Service – Sniffer – Social Engineering – Shoulder surfing – Dumpster Driving – Piggybacking.

UNIT III NETWORK PROTECTION SYSTEM AND HACKING WEB SERVERS 9

Network hacking - Routers - Firewall & Honeypots - IDS & IPS, Web Filtering - Vulnerability - Role of Security and Penetration Tester - Penetration Testing Methodology - Session Hijacking - Web Server SQL injection - Cross Site Scripting - Exploit Writing - Buffer Overflow - Web hacking - Password hacking - Email hacking - Incident hacking & Response - Bluetooth hacking - Mobile phones hacking.

UNIT IV INTRODUCTION TO INFORMATION FORENSICS 9

Computer Forensics Fundamentals – Types of Computer Forensics – Forensics – Technology and Systems - Understanding Computer Investigation – Journaling and it requirements – Standardized logging criteria – journal risk and control matrix – Neural networks – Misuse detection and Novelty detection.

UNIT V FORENSIC ANALYSIS AND TOOLS 9

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell phone and Mobile Devices Forensics – Multimedia Forensics Internet Forensics

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Illustrate the fundamental key concepts of hacking and roll of hacker
- Compare various types of hacking methods in different services
- Apply penetration test method for protecting different web services
- Examine computer forensic investigation and journaling technique in misuse detection
- Adapt forensic data hiding technique for different forensic services

TEXT BOOKS

1. Simpson, Kent Backman, James E.Corley, "Handson Ethical Hacking and Network Defense", Cengage Learning, USA, 2nd Edition, 2011.
2. Bill Nelson, Amelia Philips, ChristoperSteuart, "Guide to Computer Forensics and Investigations" , Cengage Learning, USA, 5th Edition, 2014.

REFERENCE BOOKS

1. Kenneth C.Brancik, "Insider Computer Fraud", Auerbach Publication, USA, 1st Edition, 2008.
2. Ankit Fadia, "Ethical Hacking", Macmillan Publishing, India, 2nd Edition, 2006.
3. Patrick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy", Syngress Basics Series – Elsevier, USA, 1st Edition, 2011.
4. Andrew Whitakar, Daniel P.Newman, "Penetration Testing and Network Defense", Cisco Press, USA, 5th Edition, 2006.

15UIT922	SEMANTIC WEB ENGINNERING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To learn the architecture of semantic web
- To understand the implementation of ontology
- To learn the semantic relationships among XML data elements Using Resource Description Framework (RDF)
- To study the OWL Web Ontology Language
- To learn Semantic Web tools and different applications

UNIT I INTRODUCTION 9

Introduction to the syntactic web and semantic web – Evolution of the web – The visual and syntactic web – Levels of semantics – Taxonomies – Ontologies – The semantic web architecture and technologies – Applications of semantic web – contrasting semantic with conventional technologies – Introduction To Protégé tool

UNIT II ONTOLOGICAL ENGINEERING 9

Ontologies – Taxonomies – Topic maps – Classifying ontologies – Terminological aspects: concepts, terms, relations between them – Complex objects – Subclasses and sub properties definitions – Upper ontologies – Quality – uses – Methods and methodologies for building ontologies – Ontology development process and life cycle – methods for ontology learning - Ontology evolution and versioning – Simple web ontology language (OWL) creation.

UNIT III STRUCTURING AND DESCRIBING WEB RESOURCES 9

Structured web documents: XML – Structuring – Namespaces – Addressing – Querying – Processing – RDF: introduction – Basic ideas – XML based syntax – RDF schema: Basic ideas – The language - RDFS Modeling for combinations and patterns – Transitivity – Creating and handling RDF files

UNIT IV WEB ONTOLOGY LANGUAGE 9

Basic of ontology languages – Elements of ontology: Ontology header – Annotations – Basic classification – Defining and using properties – Domain and Range – Describing properties – Data types – Negative property assertions – Property restrictions – Advanced class description – Equivalence in OWL – Design issues for ontology languages

UNIT V SEMANTIC WEB TOOLS AND APPLICATIONS 9

Development tools for semantic web – SPARQL: Querying the semantic web – Semantic Wiki – Jena framework - Applications: Software agents – Semantic desktop – Jena programs

TOTAL: 45PERIODS

COURSE OUTCOMES:

After the successful completion of the courses, the students will be able to

- identify the features of syntactic and semantic web
- Develop a small ontology for specific problem domain
- Explain data in XML with appropriate semantic tags
- Make use of web ontology language
- Apply semantic web tools for an application

TEXT BOOKS:

1. Jorge Cardoso, “Semantic Web Services – Theory, Tools and Applications”, Information Science Reference Education, 2007.
2. Michel C. Daconta, Leo J. Obrst and Kevin T. Smith, “The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management”, Wiley Publishing Inc, 2003.

REFERENCE BOOKS:

1. Grigoris Antoniou, Frank van Harmelen. “A Semantic Web Primer, Web Services, and Knowledge Management”, MIT Press (Cooperative Information Systems), 2nd Edition, 2008.
2. LiyangaYu, “A Developer's Guide to the Semantic Web”, Springer, 2011.
3. John Hebler, Matthew Fisher, Ryan Blace, “Andrew Perez-Lopez and Mike Dean,” Semantic Web Programming”, Wiley Publishing Inc, 2009.
4. Dean Allemang and James Hendler, “Semantic Web for the working Ontologist: Effective Modeling in RDFS and OWL”, Morgan Kaufmann Publishers, 2ndEdition, 2011.

15UIT923	NEURO FUZZY SYSTEMS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To cater the knowledge of Neural Networks and Fuzzy Logic control
- Be exposed to Link Analysis
- Understand Hadoop and Map Reduce
- Learn document text mining techniques

UNIT I INTRODUCTION TO NEURO FUZZY AND SOFT COMPUTING 9

Introduction: From conventional Al to computational intelligence – neural networks – Fuzzy set theory – Evolutionary computation – Neuro Fuzzy and soft computing characteristics.

UNIT II NEURAL NETWORKS 9

Adaptive Networks: Architecture – Back propagation for Feed Forward Networks, Supervised Learning Neural Networks: Perceptrons – Radial Basis Function networks- Learning from reinforcement, Unsupervised Learning Neural Networks: Competitive learning networks – Hopfield networks.

UNIT III FUZZY LOGIC 9

Fuzzy Sets: Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions, Fuzzy Rules and Fuzzy Reasoning, Fuzzy Inference Systems.

UNIT IV NEURO – FUZZY MODELING 9

Adaptive Neuro Fuzzy Inference Systems(ANFIS), Coactive Neuro-Fuzzy Modeling: Introduction-Frame work – Analysis of adaptive learning capability, Classification and Regression Trees – Data Clustering Algorithms – Rulebase Structure Identification – Neuro- Fuzzy Control-I

UNIT V ADVANCED APPLICATIONS 9

Adaptive Neuro Fuzzy Inference Systems (ANFIS) Applications, Fuzzy – Filtered Neural Networks: Application 1 – Plasma Spectrum Analysis – Application 2-Hand-Written numeral Recognition, Soft Computing for color recipe prediction: color recipe prediction-single MLP approaches – CANFIS modeling for recipe prediction.

TOTAL: 45PERIODS

COURSE OUTCOMES:

After the Successful completion of the course students will be able to

- Explain the basis of neuro fuzzy systems and soft computing
- Make use of the concept of feed forward network and major task of machine learning technique
- Examine the fuzzy logic operations and rules
- Analyze the various adaptive learning capability
- Apply neuro fuzzy system for an application

TEXT BOOKS

1. Jyh-Shing Roger Jang, Chuen – Tsai Sun, EijiMIzutani, “Neuro-Fuzzy and soft Computing”, Prenticie – Hall of India, 1st Edition, 2003.
2. James A. Freeman and David M.Skapura, “Neural Networks Algorithms, Applications, and Programming Techniques”, Pearson Edn, 1st Edition, 2003.

REFERENCE BOOKS:

1. George J. Klir and Bo Yuan, “Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1st Edition, 1995
2. Sivanandam. S.N,Sumathi. S and Deepa. S.N, “Introduction to Fuzzy Logic using MATLAB”, Springer, 1st Edition, 2007
3. Robert Fuller,” Introduction to neuro fuzzy systems”, Physicaverlag publisher, 3rd Edition, 2014
4. Ernest Czogala and jacekLeski, “Fuzzy and neuro-fuzzy intelligent systems”, Physicaverlag publishers, 3rd Edition, 2000.

15UIT924	AGILE SOFTWARE DEVELOPMENT (COMMON TO CSE AND IT)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To Learn how to immediately start producing software incrementally regardless of existing engineering practices or methodologies
- To learn how to simplify the implementation of Agile processes
- To learn how to simplify XP implementation through a Scrum Wrapper
- To learn why Agile processes work and how to manage them
- To understand the theoretical underpinnings of Agile processes.

UNIT I FUNDAMENTALS OF AGILE **9**

The Genesis of Agile, Introduction and background, Agile manifesto and Principles, overview of Scrum, Extreme Programming, Feature Drive development, Lean Software Development, Agile project Management, Design and development practices in Agile projects, Test Driven Development, Continuous Integration, Refactoring, Pair Programming, Simple Design, user Stories, Agile Testing, Agile Tools

UNIT II AGILE SCRUM FRAMEWORK **9**

Introduction to scrum, project phases, Agile Estimation, planning game, product backlog, sprint backing iteration planning, user story definition, characteristics and content of user stories, Acceptance tests and Verifying stories, Project velocity, Burn down chart, Sprint planning and retrospective, Daily Scrum, Scrum roles- product owner, Scrum Team, Scrum case study, Tools for Agile project management

UNIT III AGILE TESTING **8**

The Agile lifecycle and its impact on testing, Test-Driven Development (TDD) , X unit framework and tools for TDD, Testing user stories-acceptance tests and scenarios, planning and managing testing cycle, Exploratory testing, Risk based testing, Regression tests, Test Automation, Tools to support the Agile project management

UNIT IV AGILE SOFTWARE DESIGN AND DEVELOPMENT **10**

Agile design practices, role of design principles including single Responsibility principle, open closed principle, Liskov Substitution Principle, interface Segregation principles, Dependency inversion principle in Agile Design, Need and significance of Refactoring, Refactoring Techniques, continuous integration, Automated build tools, Version control

UNIT V INDUSTRY TRENDS **9**

Market scenario and adoption of Agile, Agile ALM, Roles in an Agile project, Agile applicability, Agile in Distributed teams, Business benefits, Challenges in Agile, Risks and mitigation, Agile projects on cloud, Balancing Agility with Discipline, Agile rapid development technologies

TOTAL: 45 PERIODS

COURSE OUTCOMES

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

- Understand the agile paradigm to software development.**(Understand)**
- Demonstrate Scrum Framework for Agile software development.**(Apply)**
- Explain various testing methods to test the agile design and development. **(Understand)**
- Demonstrate the applicability of design principles and refactoring to achieve Agility.**(Apply)**
- Explain current trends in industry towards agile software development.**(Understand)**

TEXT BOOKS

1. Ken Schawber, Mike Beedle, “Agile Software Development with Scrum”, Pearson, 2002.
2. Robert C.Martin, Micha Martin, “Agile Software Development, Principles, Patterns and Practices”, Pearson, 2007.

REFERENCE BOOKS:

1. Lisa Crispin, Janet Gregory, “Agile Testing: A Practical Guide for Testers and Agile Teams”, Addison Wesley, 2008.
2. Alistair Cockburn, “Agile Software Development: The Cooperative Game”, Addison Wesley, 2006.
3. Mike Cohn, “User Stories Applied: “For Agile Software”, Addison Wesley, 1st Edition.
4. http://martinfowler.com/agile.html
5. www.it-ebooks.info/tag/agile.

15UIT925	INFORMATION RETRIEVAL METHODS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Learn the information retrieval models
- Be familiar with Web Search Engine
- Be exposed to Link Analysis
- Understand Hadoop and Map Reduce
- Learn document text mining techniques

UNIT I INTRODUCTION **9**

Introduction-History of IR – Issues – Open source Search engine Frameworks – The Impact of the web on IR – The role of artificial intelligence (AI) in IR – IR Versus Web Search – Components of a Search engine – Characterizing the web

UNIT II INFORMATIOIN RETRIEVAL **9**

Boolean and vector-space retrieval models – Term Weighting – TF-IDE weighting-cosine similarity – Preprocessing – Inverted indices – efficient processing with sparse vectors – Language Model bas3ed IR – Probabilistic IR – Latent Semantic Indexing – Relevance feedback and query expansion

UNIT III WEB SEARCH ENGINE – INTRODUCTION AND CRAWLING **9**

Web search overview, web structure, the user, paid placement, search engine optimization/spam, Web size measurement – search engine optimization/spam – Web Search Architectures – crawling – meta-crawlers – Focused Crawling – Web indexes – Near-duplicate detection – Index Compression – XML retrieval.

UNIT IV WEB SEARCH – LINK ANALYSIS AND SPECIALIZED SEARCH **9**

Link Analysis – hubs and authorities – Page Rank and HITS algorithms – Searching and Ranking – Relevance Scoring and ranking for Web – Similarity – Hadoop & Map Reduce – Evaluation – Personalized search – Collaborative filtering and content-based recommendation of documents and products – handling “invisible” Web – Snippet generation, Summarization, Question Answering, Cross-Lingual Retrieval.

UNIT V DOCUMENT TEXT MINING **9**

Information filtering, organization and relevance feedback – Text Mining – Text classification and clustering – Categorization algorithms: naïve Bayes; decision trees; and nearest neighbor – clustering algorithms; agglomerative clustering; k-means; expectation maximization (EM).

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Make use of Artificial Intelligence techniques in Information Retrieval
- Analyze the various crawling techniques
- Choose an appropriate searching techniques in web services
- Apply document text mining techniques

TEXT BOOKS:

1. C. Manning, P. Raghavan, and H, Schutze, “Introduction to Information Retrieval”, Cambridge University Press, 2008.
2. Ricardo Baeza – Yates and BerthierRiberio – Neto, “ Modern Information Retrieval: The Concepts and Technology behind Search”, ACM Press Books, 2nd Edition 2011.

REFERENCE BOOKS:

1. Stefan Buettcher Charles L.A. Clarke, Gordon V. Cormack, “Information Retrieval: Implementing and Evaluating Search Engines”, The MIT Press, 2010.
2. OphirFrieder, “Information Retrieval: Algorithms and Heuristics: The Information Retrieval Series”, Springer, 2nd Edition 2004.
3. Bruce Croft, Donals Metzler and Trevor Strohman, “Search Engines Information Retrieval in Practice”, Addison Wesley, 1st Edition 2009.
4. Mark Levene, “An Introduction to Search Engines and web navigation’, Wiley, 2nd Edition 2010.

15UIT926	VISUALIZATION TECHNIQUES	L	T	P	C
		3	0	0	3

PRE-REQUISITES: 15UIT504 GRAPHICS AND MULTIMEDIA

COURSE OBJECTIVE:

- To Understand the basic Concepts of Visualization
- To expose the foundations and computer visualization
- To familiarize with multi dimensionally and emerging techniques

UNIT I VISUALIZATION **9**

Introduction-Issues-Data Representation – Data Presentation - Interaction

UNIT II FOUNDATIONS FOR DATA VISUALIZATION **9**

Visualization stages – Experimental SemIOTics based on Perception Gibson's Affordance theory-A Model of Perceptual Processing – Types of Data

UNIT III ARCHITECTURAL VIEWS **9**

Non-Computer Visualization – Computer Visualization Exploring Complex Information Spaces – Fisheye Views – Applications – Comprehensible Fisheye views – Fisheye views for 3D data – Non Linear magnification – Comparing Visualization of Information Spaces – Abstraction in computer Graphics – Abstraction in user interfaces

UNIT IV MULTIDIMENSIONAL VISUALIZATION **9**

One Dimension – Two Dimensions – Three Dimensions – Multiple Dimensions – Trees – Web Works – Data Mapping Document Visualization – Workspaces

UNIT V CASE STUDIES **9**

Small interactive calendars – Selecting one from many – Web browsing through a key hole – Communication analysis – Archival analysis

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course, the students will be able to

- Explain the basic principles of visualization techniques
- Identify the foundations of experimental semIOTics and types of data.
- Analyze the Non-Computer Visualization and Computer Visualization
- Compare the multiple dimensions of visualization
- Analyze the suitable visualization tools for an application

TEXT BOOKS:

1. Colin Ware,"Information Visualization Perception for Design", Margon Kaufmann Publishers, 3rd Edition, 2012.
2. Robert Spence, "Information visualization – Design for Interaction" , Pearson Education, 2nd Edition, 2007.

REFERENCE BOOKS:

1. Staurt.K.Card, Jock D.Mackinlay and Ben Shneiderman, "Readings in Information Visualization using vision to think", Morgan Kaufmann Publishers, 1st Edition, 1999
2. Robert Spence, "Information visualization- An Introduction", Springer International publishing, 3rd Edition, 2007.
3. Mathew o ward, Georges Greinstein, Daneilkeim, "Interactive data visualization-foundation, techniques and applications", CRC Press, 2nd Edition, 2015.
4. Andy Kirk, "Data Visualization a successful design process", Pack Publishers, 1st Edition, 2012.

15UIT927	MOBILITY ENGINEERING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:15UIT908 WIRELESS COMMUNICATION

COURSE OBJECTIVE:

- Learn knowledge on various mobile technologies available and their future trends
- Understand about the devices, platform, various Layers involved in Mobile Architecture
- Understand about Enterprise mobility Solution layers and Architecture
- Learn Mobile apps using Android OS
- Understand applications of mobile testing in the Industries

UNIT I INTRODUCTION TO MOBILITY 9

Emergence of Enterprise Mobility: Development in Web Standards – Advance in Wireless Technology – Innovations in Mobile Device Platforms – Enterprise Mobility Landscape: Mobile Solution Types- Key players in the Mobility Landscape – Mobile handsets – Challenges in Enterprise Mobility.

UNIT II ENTERPRISE MOBILITY ADAPTATION AND MARKETING CHANNEL 9

Enterprise Mobility Adaptation: Introduction – Key decision factors in defining a Mobility Adaptation Strategy – Steps in defining a Mobility Adaptation Strategy – Feature of mobile in Marketing – Types of Marketing – Integrated Mobile Marketing – New elements in HTML5

UNIT III ENTERPRISE MOBILITY LAYERS AND SOLUTION ARCHITECTURE 9

Enterprise Mobility layers: Device layer – Access Layer - Adaptation Layer – Management Layer – Services Layer – Application Layer – Enterprise mobility solution Architecture: Thin client Solution Architecture – Thick client Solution Architecture – Mobility Significance and Solution life cycle – Cross platform development

UNIT IV MOBILE APPLICATION DEVELOPMENT ENVIRONMENT 9

Mobile platforms in the market: Android iOS- Symbian – Windows Mobile – Black Berry Mobile application Design: Mobile Application Technology – Architecture and design consideration – Mobile Programming: Android – iPhone – Windows mobile.

UNIT V MOBILITY TESTING AND APPLICATIONS 9

Mobile Application Testing Life Cycle – Simulator Testing – Real Time Testing - Functional Testing – Performance Testing – Stability and Usability testing Mobility solution for the Healthcare Industry – Mobility in Education – Mobility in Financial service Industry – Mobile Social Networking – Location Based Services – Bring your Own Device (BYOD)

TOTAL: 45PERIODS

COURSE OUTCOMES:

After the successful completion of the course, the students will be able to

- List the challenges in enterprise mobility
- Analyze the various types of marketing
- Explain the enterprise mobility layers
- Develop mobile apps using Android OS
- Examine the mobility scenario for an application

TEXT BOOKS:

1. JitheshSathyan, Anoop.N, Navin Narayan, ShibuKizhakkeVallathai, “A Comprehensive Guide to Enterprise Mobility”, CRC Press, 2013.
2. CarstenSrensen, “Enterprise Mobility: Tiny Technology with Global Impact on Work (Technology, Work and Globalization)” Publisher Palgrave Macmillan, 2011.

REFERENCE BOOKS:

1. Greg Shackles, “Mobile Development with C#: Building Native IOS, Android, and Windows Phome Applications (Paperback)”, O’Reilly media Publishers, 2012.
2. SumilHelal, Raja Bose, Wengdong Li, “Mobile Platforms and Development Environments (Paperback)”, Morgan & Claypool Publishers, 2012.
3. “Developing Modern Mobile Web Apps patterns & Practices “Microsoft June 2012.
4. UpenaDalal, “Wireless Communication”, Oxford University Press, 2009.

15UIT928	NATURE AND BIO INSPIRED COMPUTING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To explain how biological systems exploit natural processes
- To design and implement simple bio-inspired algorithms
- To understand how large numbers of agents can self-organize and adapt

UNIT I INTRODUCTION **9**

Natural to Artificial Systems – Behavior of Social Insects: Foraging – Division of Labor – Cemetery Organization and Brood Sorting – Nest Building.

UNIT II ANT COLONY OPTIMIZATION **9**

Ant Behavior – Towards Artificial Ants – Ant Colony optimization – Combinatorial Optimization – Meta – heuristic – Local Search – Tabu Search –Global Search.

UNIT III APPLICATIONS **9**

Ant Colony Optimization algorithms for NP-hard problems: Routing problems – Assignment problem – Scheduling problem – Subset problem – Machine Learning Problem – ACO for traveling Salesman problem – Extensions of Ant Systems – ACO theoretical considerations.

UNIT IV SWARM INTELLIGENCE **9**

Biological foundations of Swarm Intelligence – Swarm Intelligence in Optimization – Particle Swarms for dynamic optimization problems

UNIT V COMPUTING PARADIGMS **9**

Biological Inspired computing to Natural Computing – Integration of Evolutionary Computation Components in Ant Colony Optimization – Particle Swarm Optimization based on Socio-cognition.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Utilize the knowledge about the Nature and Bio inspired Computing
- Explain the computational complexity of search heuristics using biologically inspired computing
- Discover the state-of-the-art of present technology
- Analyze the swarm intelligence techniques
- Construct the reconfigurable architectures and computational Intelligence techniques.

TEXT BOOKS

1. Marco Dorigo, Thomas Stutzle, “Ant colony optimization”, MIT press, 2004.
2. Eric Bonabeau, Marco Dorigo, Guy Theraulaz, “Swarm Intelligence: From Nature to Artificial Systems”, Oxford University press, 1st Edition, 2000.

REFERENCE BOOKS:

1. James Kennady, James F. Kennedy, Russell C.Eberhart, “Swarm Intelligence”, Morgan Kaufmann,1st Edition, 2001.
2. Leandro Nunes De castro, “Fundamentals of Nature Computing Basic concepts, Algorithm and Applications”, Chapman & Hall / CRC Computer & Information Science Series, 2006.
3. Leandro N.De Castro. Fernando J.VonZuben. “Recent Developments in Biologically Inspired Computung”, Idea Group Inc.2005.
4. Dario Floreano Claudio Mattiussi, “Bio-inspired Artificial Intelligence: Theories, Methods and Technologies”, MIT Press, 2008.

15UIT929	UNIX INTERNALS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To get through understanding of the kernel
- To understand the file organization and management
- To have knowledge of various system calls, process architecture, process control, scheduling and memory management

UNIT I GENERAL OVERVIEW OF THE SYSTEM 9

History – System structure – User perspective – Operating system services – Assumptions about hardware. Introduction to the Kernel: Architecture of the Unix operating system – Introduction to System concepts – Kernel data structures – System administration – Summary and Preview.

UNIT II BUFFER CACHE 9

Buffer headers – Structure of the buffer pool – Advantages and disadvantages of the buffer cache. Internal representation of files: Inodes – Structure of a regular file – Directories – Conversion of a path name to an Inode – Super block – Other file types.

UNIT III SYSTEM CALLS FOR FILE SYSTEM 9

Open – Read – Write – File and record locking – Adjusting the position of file I/O – LSEEK – Close – File creation – Creation of special files – Pipes – Dup – Mounting and Unmounting file systems.

UNIT IV THE STRUCTURE OF PROCESSES 9

Process states and transitions – Layout of system memory – The context of a process – Saving the context of a process. Process Control: Process creation – Signals – Process termination – Awaiting process termination – Invoking other programs – The shell – System boot and the INIT process.

UNIT V PROCESS SCHEDULING AND MEMORY MANAGEMENT POLICIES 9

Process Scheduling – Memory Management Policies: Swapping – A hybrid system with swapping and demand paging. The I/O Subsystem: Driver Interfaces – Disk drivers – Terminal Drivers.

TOTAL: 45PERIODS

COURSE OUTCOMES:

After Completion of the course, the students will be able to

- Analyze the basic structure and services of UNIX operating systems
- Demonstrate Buffer and File system of UNIX
- Compare various system calls for file system
- Apply the structure of system processes
- Categorize process scheduling and memory management schemes

TEXT BOOKS:

1. Maurice J.Bach, “The Design of the Unix Operating System,” Prentice Hall of India, 2004.
2. UreshVahalia, “UNIX Internals: The New Frontiers”, Pearson education, 1st Edition, 2008.

REFERENCE BOOKS:

1. Ahmad Shreateh, Julian Wolff, John McDonald, “Digital UNIX Internals and Data Structures”, Elsevier Science & Technology Books, 1997.
2. Myril Clement Shaw; Susan Soltis Shaw, “UNIX internals: A System operation handbook”, Blue Ride remmit, 4th Edition 2010.
3. Steve D. Pate, “UNIX internals: A Practical Approach”, Addison – Wesley, 1996.
4. Curt Schimmel, “UNIX Systems for Modern Architectures”, Addison Wesley Professional Computing Series, 4th Edition, 2003.

15UIT930	PROGRAMMING WITH PYTHON	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To learn how to identify Python object types.
- To learn how to design object oriented programs with Python Classes.
- To learn how to use exception handling in Python applications for error handling.
- To learn how to use class inheritance in Python for reusability
- To learn how to read and write files in Python.
- To learn how to design and program python applications.

UNIT I GETTING STARTED WITH PYTHON 9

Introduction to Python – Advantages of Python programming – Variables – I/O methods – data types – Strings – List – Tuples – Dictionaries – Sets Operators – Flow Control – Loops

UNIT II FUNCTIONS AND EXCEPTION 9

Functions: Declaration – Types of arguments – Anonymous functions: lambda – Generators – Decorators – Exception Handling – Regular Expression – Calendars and Clocks

UNIT III MODULES AND CLASS 9

Introduction – Modules and the import Statement – Packages – Objects and Classes: Class with class – Override a Method – Get and Set Attribute Values – Name Mangling – Method Types – Duck Typing – Relationships.

UNIT IV FILES AND DATA BASES 9

File I/O operations – Directory Operations – Reading and Writing in structured Files: CSV and JSON – Data manipulation using Oracle, MySQL and SQLite

UNIT V GUI AND WEB 9

UI design: Tkinter – Events – Socket Programming – Sending email – CGI: Introduction to CGI Programming, GET and POST Methods, File Upload

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of Python Programming elements to solve and debug logical Problems [Apply]
- Demonstrate Programs using 'functions' and exceptions [Apply]
- Real time Applications using Object Oriented Concepts [Apply]
- Analyze Various techniques used to store and retrieve data in files and databases [Apply]
- Develop an application that meet with realistic constraints for public health and safety, cultural, societal and environmental considerations user GUI Principles [Apply]

TEXT BOOKS:

- Peter Wentworth, Jeffrey Elkner, Allen B. Downey, and Chris Meyers, "How to Think Like a Computer scientist: Learning with Python", O'reilly, Third Edition, 2014.
- MarkLutz, "Powerful Object Oriented Programming Python", O'reilly, Fourth Edition, 2012.

REFERENCE BOOKS

1. Mark Lutz, "Learning Python, Powerful OOPs", O'reilly, 2011.
2. Zelle, John M, "Python Programming: An Introduction to Computer Science", FranklinBeedle& Associates, 2003.
3. Budd, Timothy, "Exploring Python", McGraw-Hill Science, 2009.

WEB REFERENCES:

1. Python tutorial URL:, https://docs.python.org/3/tutorial/
2. Advanced Python URL:, https://www.learnpython.org/
3. Python basic tutorial URL:, www.pyschools.com/

15UIT931	OBJECT ORIENTED SYSTEM DESIGN	L	T	P	C
		3	0	0	3

COURSE :

PRE-REQUISITES:

COURSE OBJECTIVE:

- To provide the importance of the software design process
- To assess Unified Modeling Language and use the UML design diagrams
- To learn basic OO analysis and design skills through case study
- To learn the appropriate usage of design patterns.

UNIT I INTRODUCTION 9

An Overview of Object Oriented Systems Development – Object Basics –Object Oriented Systems Development Life Cycle – Unified Modeling Language.

Case study: Develop a Problem statement

UNIT II OBJECT ORIENTED ANALYSIS 9

Objects Analysis – Use case Diagram – Identifying use cases and relationships – Class Diagram – Identifying Attributes and Methods

Case study: Analyzing Use case Driven Process

UNIT III OBJECT ORIENTED DESIGN 9

Design process and Design axioms – Interaction Diagram: Sequence and Collaboration Diagram – Activity Diagram – State Chart Diagram – Package Diagram

Case study: Draw the UML Diagrams for Real Time Application

UNIT IV OBJECT ORIENTED METHODOLOGIES 9

Rumbaugh Methodology – Booch Methodology – Jacobson Methodology – Patterns – Frameworks – Unified Approach

Case Study: Identify the User Interface, Domain Objects, and Technical services (Code generation)

UNIT V OBJECT ORIENTED TESTING 9

Testing – Issues in OO testing: Units, Implications and Levels – Class Testing – OO Integration Testing – Component and Deployment Diagrams.

Case study: Perform testing for simple applications

TOTAL: 45PERIODS

COURSE OUTCOMES:

After completion, the student will be able to

- Apply the knowledge of Object Oriented software development (PO1) **[Apply]**
- Analyze Object Oriented concepts by creating use case and class diagrams (PO2) **[Analyze]**
- Apply appropriate UML diagrams for Object Oriented design (PO 5) [**Apply]**
- Identify Object Oriented methodologies to develop OO Design patterns and frameworks (PO2) [**Analyze]**
- Apply various testing strategies for real world applications (PO6) **[Apply]**

TEXT BOOKS

1. Ali Bahrami, "Object Oriented System Development", Tata McGraw Hill Education Private Limited, Special Indian Edition, 2008.
2. MichealBlaha, James Rambaugh, "Object – Oriented Modeling and Design with UML", Prentice Hall of India, Second Edition, 2007.

REFERENCE BOOKS

1. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Addison Wesley, Second Edition, 2005.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "Applying UML and Patterns: An Introduction to Object – Oriented Analysis and Design and Iterative Development", Pearson Education, Third Edition, 2008.
3. Erich Gamma, Richard Helm, Raph Johnson, "Design patterns: Elements of Reusable Object – Oriented Software," Addison Wesley, Second Edition, 2005.
4. Mike O'Docherty, Ralph Johnson, Ivar Jacobson, "Object – Oriented Analysis &Design Understanding System Development with UML 2.0", John Wiley & Third Edition, 2008.

15UIT932	ORGANIZATIONAL BEHAVIOR	L	T	P	C
		3	0	0	3

COURSE :

PRE-REQUISITES:

COURSE OBJECTIVE:

- To provides a comprehensive analysis of individual and group behavior in organizations. Its purpose is to provide an understanding of how organizations can be managed more effectively and at the same time enhance the quality of employees work life. Topics include motivation, rewarding behavior, stress, individual and group behavior, conflict, power and politics, leadership, job design, organizational structure, decision making, communication and organizational change and development.

UNIT I FOCUS AND SCOPE 9

Definition, need and importance of organizational behavior – Nature and scope – Frame work – Organizational behavior models.

UNIT II INDIVIDUAL BEHAVIOR 9

Foundations of Individual Behavior: Personality and Values, Attitudes and Job Satisfaction, Perception and Individual Decision Making, Motivation: Concepts and Applications, Emotions and Moods

UNIT III GROUP BEHAVIOR 9

Foundations of Group Behavior, Defining and Classifying Groups, Stages of Group Development, Group Properties: Roles, Norms, Status, Size, and Cohesiveness, Group Decision Making – Understanding Work Teams: Differences between Groups and Teams, Types of Teams, Creating Effective Teams, Turning Individuals into Team Players – Communication – Control.

UNIT IV LEADERSHIP AND POWER 9

Meaning – Importance – Leadership styles – Theories – Leaders Vs Managers – Sources of power – Power centers – Power and Politics.

UNIT V DYNAMICS OF ORGANIZATIONAL BEHAVIOR 9

Foundations of Organizational Structure – Organizational Culture – Human Resource Policies and Practices – Organizational Change and Stress Management.

Case study: Perform testing for simple applications

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Understand the concepts, nature and principles of Organizational Behavior and Positive Psychology at Work.
- Analyze individual human behavior in the workplace as influenced by personality, values, perceptions, and motivations.
- Analyze the complexities associated with management of the group behavior in the organization.
- Evaluate the appropriateness of various leadership styles and conflict management strategies used in organizations.
- Assess the potential effects of organizational-level factors (such as structure, culture and change) on organizational behavior.

TEXT BOOKS

1. Stephen P. Robins, Timothy A. Judge, Organizational Behavior, PHI Learning / Pearson Education, 15th edition, 2012.
2. Fred Luthans, Organizational Behavior, McGraw Hill, 11th Edition, 2001.

REFERENCES

1. Schermerhorn, Hunt and Osborn, Organisational behavior, John Wiley, 9th Edition, 2008.
2. Udai Pareek, Understanding Organisational Behaviour, 2nd Edition, Oxford Higher Education, 2004.
3. Mc Shane & Von Glinov, Organisational Behaviour, 4th Edition, Tata Mc Graw Hill, 2007.
4. Hellrigal, Slocum and Woodman, Organisational Behavior, Cengage Learning, 11th Edition 2007.
5. Ivancevich, Konopaske & Maheson, Oranisational Behaviour & Management, 7th edition, Tata McGraw Hill, 2008.

15UCS902	INFORMATION STORAGE MANAGEMENT	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce storage architectures and key data center elements in classic, virtualized, and cloud environments
- To explain storage networking technologies such as FC SAN, IP SAN, FCoE, NAS, and object – based and unified storage
- To impart the knowledge of Backup and Archive in virtualized and non-virtualized Environment

UNIT I STORAGE SYSTEMS 9

Introduction to information storage – evolution of storage architecture, key data center elements, virtualization, and cloud computing – Data center environment – Details key data center elements – host (or compute), connectivity, storage, and application in both classic and virtual environments – RAID – RAID implementations, techniques, and levels along with the impact of RAID on application performance – Intelligent storage system – Details Components of Intelligent storage systems. It also covers virtual storage provisioning and intelligent storage system implementations.

UNIT II STORAGE NETWORKING TECHNOLOGIES 12

Fibre Channel Storage Area Network (FC SAN) –FC SAN components, connectivity options, and topologies including access protection mechanism, zoning, IP SAN and Fibre Channel over Ethernet (FCoE)- iSCSI and FCIP protocols for storage access over an IP network. Converged protocol FCoE and its components. Network Attached storage (NAS) – File sharing technology using NAS and covers its benefits, components, and implementations. File level storage virtualization. Object based and Unified Storage – Emerging areas of object-based storage and unified storage solutions. Content Addressed Storage (CAS) as an implementation of an object – based solution.

UNIT III BACKUP, ARCHIVE, AND REPLICATION 10

Introduction to Business Continuity – information availability and business continuity solutions in both virtualized and non-virtualized environments. Backup and Archive- Backup and recovery in both virtualized and non-virtualized environments – Deduplication technology to optimize data backups along with archival solutions to address fixed content storage requirements. Local Replication – Local replications of data along with data restore and restart considerations. Remote Replication – Remote replication technologies in virtualized and non-virtualized environments. Three-site replication and continuous data replication.

UNIT IV CLOUD COMPUTING 7

Cloud Computing – Cloud computing, its benefits, characteristics, deployment models and services. Cloud challenges and migration considerations.

UNIT V SECURING AND MANAGING STORAGE INFRASTRUCTURE 8

Securing the Information Infrastructure – Framework and domains of storage security along with covering security implementation at storage networking. Security in virtualized and cloud environments – Managing the information Infrastructure - storage infrastructure monitoring and management – Storage tiering, Information Lifecycle Management (ILM), and cloud service management activities.

TOTAL: 45PERIODS

COURSE OUTCOMES:

After Completion of the course, the students will be able to

- Discuss the various storage system principles
- Describe Storage Networking technology requirements and solutions
- Explain about the data replication techniques
- Demonstrate cloud deployment models and services
- Identify parameters for managing and monitoring storage infrastructure

TEXT BOOKS:

1. EMC Corporation, Information Storage and Management", Wiley, ISBN number:04702942134.
2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill, Osborne, 2003.

REFERENCE BOOKS:

1. G. Somas sundaram, AlokShrivastava, "Informaton storage and Management", Wiley, India.
2. Ulf Troppens, Wolfgang MuellerFriedt, Rainer Erkens, "Storage Network explained: Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE", Wiley, India.
3. Marc Farley, "Building Storage Networks", Tata McGraw Hill, Osborne, 2001.
4. MeetaGupt" storage Area Network Fundamentals", Pearson Education Limited 2002.

15UCS925	BUSINESS INTELLIGENCE AND ITS APPLICATIONS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce business intelligence terminologies and framework
- To impart the knowledge on basics of data integration (Extraction Transformation Loading)
- To explain the concepts of multi-dimensional data modeling.
- To review the basics of enterprise reporting different data analysis tools and techniques.

UNIT I INTRODUCTION TO BUSINESS INTELLIGENCE 9

Introduction to OLTP and OLAP, BI Definitions & Concepts, Business Applications of BI, BI Framework, Role of Data Warehousing in BI, BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities.

UNIT II BASICS OF DATA INTEGRATION (EXTRACTION TRANSFORMATION LOADING) 9

Concepts of data integration need and advantages of using data integration, introduction to common data integration approaches, introduction to ETL using SSIS, Introduction to data quality, data profiling concepts and applications.

UNIT III INTRODUCTION TO MULTI-DIMENSIONAL DATA MODELING 9

Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. Multi-dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using SSAS.

UNIT IV BASICS O F ENTERPRISE REPORTING 9

Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, introduction to SSRS Architecture, enterprise reporting using SSRS.

UNIT V FUTURE OF BUSINESS INTELLIGENCE 9

Future of business intelligence – Emerging Technologies, Machine Learning, Predicting the Future, BI Search & Text Analytics – Advanced Visualization – Rich Report, Future beyond Technology.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Describe the need for Business Intelligence.
- Demonstrate technology and processes associated with Business Intelligence framework.
- Identify the metrics, indicators and make recommendations to achieve the business goal in a given business scenario.
- Design an enterprise dashboard that depicts the key performance indicators which helps in decision making
- Illustrate the concepts for the future of business intelligence.

TEXT BOOKS:

1. Prasad. R.N, SeemaAcharya, “Fundamentals of Business Analytics”, Second Edition, Wiley 2011.

REFERENCE BOOKS:

1. Larissa T. Moss, Atre. S, “Business Intelligence Roadmap: The Complete Project Lifecycle of Decision Making”, Addison Wesley, 2003.
2. David Loshin Morgan, Kaufman, “Business Intelligence: The Savvy Manager's Guide”, Second Edition, 2012.
3. CindiHowson, “Successful Business Intelligence: Secrets to Making BI a Killer App”, McGraw-Hill,2007.
4. Mike Biere, “Business intelligence for the enterprise”, IBM Press.

INTER DISCIPLINARY ELECTIVE COURSE

Course Code	Course Title	L	T	P	C
15UGM951	Smart Manufacturing(Common to IT & Mech)	3	0	0	3
15UGM953	Big Data and IOT In Medical Applications (Common to IT & Bio-Medical)	3	0	0	3

15UGM951	SMART MANUFACTURING (Common to IT & Mech)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the smart connected systems using Internet of Things, Cloud and Industrial Automation
- To use devices in IOT Technology
- To familiarize the concepts of designing and developing various service models (IaaS, Paas and SaaS) and deployment models (Public, Private and Hybrid clouds).

UNIT I INDUSTRY 4.0 9

Introduction to Industrial revolutions - Industry 4.0 environment - Drivers of industry 4.0 - Digital integration in smart factory - Cyber Physical System, Internet of Things and Services - New technologies for future manufacturing - Benefits and Challenges of Industry 4.0

UNIT II ADDITIVE MANUFACTURING AND 3D PRINTING 9

Introduction to additive manufacturing – classification of AM process – Generic AM process – Reverse Engineering – Computer Aided Engineering - Powder fusion mechanism – Process parameter & Modeling – PBF commercial machine - Material Jetting – Guide line for process selection- Application of AM

UNIT III ROBOTS IN MANUFACTURING 9

Introduction about robotics in automation - Robot classification – Artificial Intelligence and Robotics - Robot applications in manufacturing – Material handling – Processing Operations – Assembly and Inspection – Future Robot Technology and tasks – Social and Labor Issues.

UNIT IV INTERNET OF THINGS 9

Internet of Things Promises–Definition– Scope–Sensors for IOT Applications–Structure of IOT– IOT Map Device. Technological Analysis: Wireless Sensor Structure–Energy Storage Module–Power Management Module–RF Module–Sensing Module IOT Development Examples- Preparing IOT Projects(Sensor, Actuator, Controller, Camera)

UNIT V CLOUD SERVICES AND FILE SYSTEM 9

Cloud Computing Basics: Cloud Computing definition, Types of Cloud services: Types of Cloud services: Software as a Service-Platform as a Service–Infrastructure as a Service-Database as a Service-Monitoring as a Service–Communication as a services. Service providers-Google App Engine, AmazonEC2,Microsoft Azure, Sales force.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

- Explain about the industrial revolutions, IOT, benefits and challenges of Industry 4.0(Understand)
- Describe an overview of additive manufacturing for industrial products (Understand)
- Explain about applications of robots in manufacturing industry and social impact (Understand)
- Design IOT Components that meet with realistic constraints for societal and environmental considerations.(Create) – Po3
- Apply the knowledge of virtualization techniques to provide Iaas, Saas, Paas.(Apply) – Po1

TEXT BOOKS:

1. Industry 4.0: The Industrial Internet of Things, Alasdair Gilchrist, Apress, Berkeley CA,2016, 978-1-4842-2046-7
2. The Concept Industry 4.0 : An Empirical Analysis of Technologies and Applications in Production Logistics, Bartodziej, Christoph Jan, 1st Edition, Springer Gabler, 2017. 978-3-658-16501-7
3. Rajkumar Buyya,ChristianVecchiola,ThamaraiSelviS,"MasteringCloudComputing",TataMcGraw Hill Education PrivateLimited,1stEdition,2013.

REFERENCE BOOKS:

1. Additive Manufacturing Technologies (3D printing, Rapid prototype and Direct Digital Manufacturing, Gibson, Ian, Rosen, David, Stucker, Brent, Springer, 2015.
2. Industrial Robotics – Mikell P. Groover – Tata McGraw-Hill Publishing Company, 2008.
3. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014.

15UGM953	BIG DATA AND IOT IN MEDICAL APPLICATIONS (Common to IT & Bio-Medical)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the basics of Internet of things(IOT) and protocols
- To explain the concepts of Web of Things and Cloud of Things
  To discuss the healthcare operations and recent development

UNIT I INTRODUCTION TO BIGDATA 9

Introduction to Big Data Platform–Challenges of conventional systems-Web data–Evolution of Analytic scalability, analytic processes and tools, Analysis vs reporting- Modern data analytic tools, Statistical concepts: Sampling distributions, resampling, statistical inference, prediction error.

UNIT II DATA ANALYSIS 9

Regression modeling, Multivariate analysis, Bayesian modeling, Inference and Bayesian networks, and Support vector and kernel methods, Analysis of time series: linear systems analysis, nonlinear dynamics-Rule induction-Neural networks: learning and generalization, competitive learning, principal component analysis and neural networks; Fuzzy logic: extracting fuzzy models from data, fuzzy decision trees, and Stochastic search methods.

UNIT III INTRODUCTION TO IOT 9

Introduction to Elements of IOT - Basic Architecture of an IOT Application Sensors & Actuators - Edge Networking (WSN) – Gateways - IOT Communication Model – WPAN & LPWA, Future Trends – Standards

UNIT IV INTRODUCTION TO HEALTH CARE OPERATIONS 9

A systems look at health care – opportunities and challenges – Integrated framework for operations management – Evidence Based Medicine and Pay for Performance –Hospital business operations

UNIT V RECENT DEVELOPMENTS 9

Techniques and tools – Map Reduce paradigm and the Hadoop system – IOT: Clustering, Synchronization and Software Agents. Applications, Social Media Analytics – Recommender Systems – Fraud Detection – Big Data in Medicine and Healthcare

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

- Analyze various protocols for IOT and a middleware for IOT.
- Implement the different models for network dynamics.
- Identify the various sources of Big Data, new algorithms for collecting Big Data from various sources.
- Design algorithms for pre-processing Big Data and to extract data from structured and un-structured data for analytics.
- Apply IOT in medicine and health care applications.

TEXT BOOKS:

1. Michael Berthold, David J.Hand, “Intelligent Data Analysis”, Springer, 2007.
2. Anand Rajaraman and, Jeffrey David Ullman, ”Mining of Massive Datasets”, Cambridge University Press, 2012
3. Olivier Hersent, David Boswarthick, Omar Elloumi, “The Internet of Things: Key Applications and Protocols”, 2nd Edition, Wiley Publications, 2012.
4. Daniel B.McLaughlin, Julie M.Hays, ” . Healthcare Operations Management ”,HAP, Second Edition, , 2008.

REFERENCES:

1. Michael Minelli, Michele Chambers, Ambiga Dhiraj , “Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends”, John Wiley & Sons, 2013
2. Dieter Uckelmann ,Mark Harrison , Florian Michahelles, “Architecting the Internet of Things”, Springer Publishing, 2011
3. Vijay Madisetti and ArshdeepBahga, “Internet of Things (A Hands-on-Approach)”, 1st Edition, VPT, 2014
4. R.Langabeer ” Healthcare Operations Management: A Quantitative Approach to Business and Logistics ”, Jones & Bartlett Publishers, First Edition, 2007

MULTIDISCIPLINARY ELECTIVE COURSE

Course Code	Course Title	L	T	P	C
15UGM952	Automation in Agriculture (Common to Mech, IT &Agri)	3	0	0	3

15UGM952	AUTOMATION IN AGRICULTURE (Common to Mech, IT &Agri)	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To expose the students to the concept of Agriculture Automation and Farm Mechanization
- To learn about the different types of primary and secondary tillage implements, farm equipment and ploughing methods.
- To introduce the concepts of Automatic Systems and IOT applications
- To train the students to explore and use new technologies in Agriculture
-

UNIT I INTRODUCTION TO FARM MECHANIZATION & AGRICULTURE AUTOMATION 8

Sources of farm power- merits& demerits of different farm power- farm mechanization-concept – scope-constraints & scope –selection factors. Mechanization in farm operations. Introduction - agriculture automation.

UNIT II TILLAGE IMPLEMENTS & AUTOMATION IN SOWING, PLANTERS 10

Tillage-objective- classification- primary tillage - mould board plough working principle –Disc plough working principle -secondary tillage –Disc harrow-single action-double action- off set-cultivator types.

Sowing &fertilizer equipment-sowing methods- Automation in sowing- seed drill-components of seed drill-seed cum fertilizer. Automation in planters-ex: potato planter, sugar cane planter.

UNIT III SYSTEMS OF AUTOMATION 8

Automated Irrigation – Pneumatic System and its applications – Portable timer system – Timer/Sensor Hybrid/SCADA – Methods of automating Irrigation layout – Machine Learning in Tank Monitoring System.

UNIT IV IOT IN AGRICULTURE 10

IOT based Automated Irrigation System – IOT based Smart Irrigation – Sensor based Automation – types – operation – Solar based Automatic Irrigation System – components – operation - Automation by sensing soil moisture-– Automation using ANN based controller.

UNIT V AGRICULTURAL ROBOT 9

Introduction to Agricultural Vehicle Robot - Overview of a Robot Farming System- Agricultural Robot Vehicles - Robot Management System-Multi robot systems -Agricultural robots-types, operations.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

- Understand the importance of Farm mechanization concept of Agriculture Automation. (Understand)
- Classify the various tillage implements, seed drills, automation in Sowing and planters (Understand)
- Apply the knowledge of different systems to automate irrigation. (Apply)
- Apply the knowledge of IOT to design smart systems for automating Agriculture. (Apply)
- Apply the knowledge of robots to automate crop cultivation in Agriculture.(Apply)

TEXT BOOKS:

1. Jagdishwarsahay 2006, Elements of Agricultural Engineering, Standard Publishers Distributors, New Delhi.,
2. Qin Zhang_ F J Pierce-(2013) Agricultural Automation_ Fundamentals and Practices-CRC Press Taylor & Francis Group.

REFERENCE BOOKS:

1. E.L. Barger, R.A. Kepner, Roy Bainer, Principles of Farm Machinery (Third Edition), CBS Publishers & Distributors Pvt. Ltd.
2. Harris Pearson Smith and Lambert Henry Wilkes, Farm machinery and equipment's, 6thedition, Tata McGraw-Hill, New Delhi, 1997.
3. Michael and ojha 2005, Principles of Agricultural Engineering, Jain brothers, New Delhi.

ONE CREDIT COURSES

Course Code	Course Title	L	T	P	C
15UIT861	IT- Infrastructure Management Service	1	0	0	1
15UCS861	Software Project Management	1	0	0	1
15UIT862	Introduction to 3D Animation	1	0	0	1
15UIT863	Web Programming with PHP	1	0	0	1
15UIT864	Android Programming – I	1	0	0	1
15UIT865	Android Programming – II	1	0	0	1
15UIT866	Foundation Program 5.0	1	0	0	1
15UIT867	Logics of Programming	1	0	0	1
15UIT868	Arduino Raspberry Pi	1	0	0	1
15UIT869	No SQL	1	0	0	1
15UIT870	PHP Fundamentals	1	0	0	1

15UIT861	IT-INFRASTRUCTURE MANAGEMENT SERVICE	L	T	P	C
		1	0	0	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To familiarize the students with the characteristics of IT IMS
- To learn the Technology drivers of infrastructure evolution

UNIT I **5**

IT IMS-operation and management of an enterprise IT environment. Hardware, Software, network resource, servers, data centers and required for the existence. This discipline of managing & maintaining hardware, network systems and applications and is commonly referred as infrastructure management services (IMS).

UNIT II **5**

Information Technology has become critical in every business, right from banking, finance, insurance, automobile, aviation, media, and entertainment and so on. Usage of computers, hardware devices and network is rapidly growing. For businesses, it is becoming very vital to keep the hardware, networks and applications functionally up to date and running in 24 X 7 mode.

UNIT III **5**

Today it is one of the most rapidly growing disciplines in information technology arena and it is being seen as the third wave in Indian IT industry. Introduction evolution of IT infrastructure. IT IMS market size. Recent trends in IT infrastructure management. Infrastructure components. Technology drivers of infrastructure evolution. IT IMS-industries expectation from an engineer. Employability skills essential for an engineer to be part of the domain – IMS. IT IMS Indian scenario job role & opportunities in IT IMS industry.

TOTAL: 15PERIODS

COURSE OUTCOMES:

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

- Explain the Infrastructure management service
- Analyze the need of Hardware and Network in a business
- Apply the employability skills essential for an engineer to be part of the domain - IMS

15UCS861	SOFTWARE PROJECT MANAGEMENT	L	T	P	C
		1	0	0	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To familiarize the students with the characteristics of a project and project management principles
- To summarize competency in the management of a project plan, especially in monitoring and controlling the project schedule and tracking project progress

UNIT I PROJECT EVALUATION AND PROJECT PLANNING 5

Importance of Software Project management – Activities Methodologies – Categorization of Software projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost -benefit evaluation technology – Stepwise project Planning.

UNIT II ACTIVITY PLANNING 5

Objectives of Activity planning – Project schedules – Activities – Sequencing and Scheduling – Network Planning models – Forward Pass & Backward pass techniques – Critical path (CRM) method.

UNIT III PROJECT MANAGEMENT AND CONTROL 5

Framework for Management and Control – Collection of data project termination – Visualizing progress – Cost Monitoring – Earned Value Analysis – Project tracking – Change control – Software Configuration Management – managing contracts – Contract Management.

TOTAL: 15PERIODS

COURSE OUTCOMES:

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

- Explain the process involved in software project management.
- Prepare the activity plan to manage real-world challenges.
- Apply appropriate mechanisms for tracking the software projects.

TEXT BOOKS:

1. Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.

REFERENCE BOOKS:

1. Robert K. Wysocki “Effective Software Project Management “ – Wiley Publication, 2011.
2. Walker Royce: “Software Project Management” – Addison – Wesley, 1998.
3. Gopalaswamy Ramesh, “managing Global Software Projects” – McGraw Hill Education (India), Fourteenth Reprint 2013.

15UIT862	INTRODUCTION TO 3D ANIMATION	L	T	P	C
		1	0	0	1

UNIT I BASIC 3D MODELING TECHNIQUES 4

Model with Primitives Reference Coordinate Systems and, Applying Transforms and Sub-Object Mode, Cloning and Grouping and Poly Modeling, Creating Shapes with Splines, Editing Meshes and Creating Complex Objects

UNIT II ENHANCING MODELS WITH MATERIALS 4

Understanding Bitmap Texture Maps, Adding Materials to Objects & Material Libraries, Editing Materials & Map scalar Modifiers, Modeling with displacement Maps

UNIT III Introduction to Animation 3

Copying Key frames, Path Animation and Trax Editor, Anticipation and Momentum in Knife Throwing, Setting Up the Scene and Beginning the Soldier Model

UNIT IV CHARACTER ANIMATION 4

Character Modelling and Texturing, Skeleton and Iks and Keys, Export the character and its animations, Load the Character in Virtools, Material & texture tuning, Merge animations & add behaviors.

TOTAL: 15PERIODS

COURSE OUTCOMES:

After successful completion of the course the student will able to

- Discuss the principles of narrative and timing in relation to 3D animation
- Create texture, illuminate and render images and backgrounds in the production of simple 3D animation sequences, using 3D animation software.
- Present and critique 3D animation concepts.

TEXT BOOKS:

1. Jeffrey M. Harper, “Mastering Autodesk 3ds Max 2013”, John wiley, 2013
2. Randi L. Derakshani, “DariushDerakhshani Autodesk® 3ds Max”, 2014.

15UIT863	WEB PROGRAMMING WITH PHP	L	T	P	C
		1	0	0	1

UNIT I HISTORY OF PHP & PHP VARIABLE 2

Client side scripting, Server side scripting, Characteristics of PHP, Syntax of PHP and Hello World program, Data types and variables, PHP Server variables, PHP Constants, Arrays & String

UNIT II OPERATORS 2

Arithmetic operators, Comparison operators, Logical operators, string operators, Array operators

UNIT III BRANCHING & LOOPING 2

If-Else, Nested If – Else, For, While, Do – While, Switch

UNIT IV PHP-FUNCTIONS 2

In build Function, User Defined Function, and Calendar Function

UNIT V ADVANCE PHP 7

PHP Session, PHP Cookies, File Upload, File Handlings, PHP Form Handling, Do-Get (), Do-Post(),PHP – Database Connectivity

TOTAL: 15PERIODS

COURSE OUTCOMES:

After successful completion of the course the student will able to

- Develop functional PHP script
- Understand the use of PHP with HTML
- Understand the ability to post and publish a PHP website.
- Develop Web Applications

TEXT BOOKS:

1. Vikramvaswani, “PHP – A Beginners Guide”, McGraw – Hill,2009
2. Steven Holzner, “PHP: The Complete Reference”, Tata McGraw Hill, 2007.

15UIT864	ANDROID PROGRAMMING –I	L	T	P	C
		1	0	0	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand the essentials of mobile apps development
- To understand the fundamental concept of designing and developing

UNIT I INTRODUCTION TO ANDROID 4

Introduction to android (features, applications), Environment setup, Architecture, Applications Component, Hello world example

UNIT II ACTIVITY CREATION 4

Activities, Services, Media player, Broadcast receivers

UNIT III COMPONENT FUNCTIONALITIES 3

Content providers, Intents & filters, Event handling

UNIT IV LAYOUTS 4

Ul layouts, Relative, linear, table, Grid view, Ul controls, Notifications

TOTAL: 15 PERIODS

COURSE OUTCOMES:

After successful completion of the course the student will able to

- Understand the existing state of mobile app development via researching existing apps, and formulating new ideas.
- Display proficiency in coding on a mobile programming platform.
- Understand the limitations and features of developing for mobile devices.

REFERENCE LINKS:

1. https://www.bignerdranch.com/we-write/android-programming
2. http://www.technotopia.com/index.php/Android Studio Development Essentials

15UIT865	ANDROID PROGRAMMING –II	L	T	P	C
		1	0	0	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand the fundamental concept of designing and developing
- To learn the various testing process.

UNIT I CUSTOM COMPONENTS **4**

Sending Email, Sending SMS, Phone Calls, Audio Manager

UNIT II SENSORS **4**

Network Connection, Image Switcher, Image view, Gestures

UNIT III INTERNAL STORAGE **3**

Sqlite Database creation, Sqlite Database Access and Modification File Storage

UNIT IV PHP/SQL **4**

Mysql integration with android, server side integration, push notifications, screen cast.

TOTAL: 15 PERIODS

COURSE OUTCOMES:

After successful completion of the course the student will able to

- Use the development tools in the Android development environment
- Display proficiency in coding on a mobile programming platform.
- Create a complete Mobile app with a significant programming component, involving the sensors and hardware features of the phone.

REFERENCE LINKS:

1. https://www.bignerdranch.com/we-write/android-programming
2. http://www.technotopia.com/index.php/Android Studio Development Essentials

15UIT866	FOUNDATION PROGRAM 5.0	L	T	P	C
		1	0	0	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To learn the python fundamentals
- To learn the database fundamentals
- To learn python database integration

UNIT I PROGRAMMING FUNDAMENTALS 5

Introduction to Programming – Algorithm, Flow Chart and Pseudo Code – Python Fundamentals – Control Structure – Data Structures - Functions – File Handling – Exception Handling – Modules and package – More on Data Structures

UNIT II DATABASE FUNDAMENTALS 5

Data and Need for DBMS - Relational Model and Keys - Database Development Life Cycle- Data Requirements - Logical Database Design - Physical Database Design - Normalization - Implementation with SQL - SQL - Built-in Functions - SQL - Group By and Having Clauses

UNIT III PHYTHON DATABASE INTEGRATION 5

Python Database Integration – Pre-requisites and Installation – SELECT Operation – CREATE and INSERT Operation – UPDATE Operation – DELETE Operation – Exception Handling

TOTAL:15PERIODS

COURSE OUTCOMES:

After Successful completion of the course the student will able to

- Illustrate basic concepts of python programming
- Illustrate basic concepts of Database Fundamental
- Apply database integration with Python

COURSE MATERIAL

SELF LERNING MODE LINK: https://campusconnect.infosys.com/Content/FPContent.aspx

15UIT867	LOGICS OF PROGRAMMING	L	T	P	C
		1	0	0	1

COURSE OBJECTIVE:

- To provide exposure to problem-solving through programming
- It Involves a lab component which is designed to give the student hands-on experience with the concepts.

List of Experiments:

1. Write a program to calculate overtime pay of 10 employees. Overtime is paid at the rate of Rs. 12.00 per hour for every hour worked above 40 hours. Assume that employees do not work for fractional part of an hour.
2. At a football match, tickets are sold in three categories: reserved, stands, and grounds. For each of these categories, you are given the ticket price and the number of tickets sold. Write a program to prompt for these values and print the amount of money collected from each category of tickets. Also print the total number of tickets sold and the total amount of money collected
3. Ten numbers are entered from the keyboard into an array. The number to be searched is entered through the keyboard by the user. Write a program to find if the number to be searched is present in the array and if it is present, display the number of times it appears in the array.
4. Write a program which to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in.
    1. If the student gets first class and the number of subjects he failed is greater than 3, then he does not get any grace. If the number of subjects he failed is less than or equal to 3 then the grace is of 5 marks per subject.
    2. If the student gets second class and the number of subjects he failed is greater than 2, then he does not get any grace. If the number of subjects he failed is less than or equal to 2 then the grace is of 4 marks per subject.
    3. If the student gets third class and the number of subjects he failed is greater than 1, then he does not get any grace. If the number of subjects he failed is equal to 1 then the grace is of 5 marks per subject
5. The user inputs a number and then enters a series of numbers from 1 to that number. Your program should determine which number (or numbers) is missing or duplicated in the series, if any. For example, if the user entered 5 as the initial number and then entered the following sequences, the results should be as shown.

```
Input Sequence      Output
----------------    ---------------
1 2 3 4 5           Nothing bad
```

However, if 7 were the highest number, the user would see the results on the right for the following number entries:

```
Input Sequence          Output
----------------        ---------------
1 3 2 4 5               Missing 6
                        Missing 7
```

If 10 were the highest number and the user entered the numbers shown on the left, note the list of missing and duplicate numbers:

```
Input Sequence          Output
----------------------  ---------------
1 2 4 7 4 4 5 10 8 2 6  Duplicate 2 (2 times)
                        Missing 3
                        Duplicate 4 (3 times)
                        Missing 9
```

The program should check the highest number that the user inputs to ensure that it does not exceed the size of any array you might be using for storage.

6. Write a program to calculate the volume of the following shapes: Cube, Cuboid, Sphere,Cylinder and Cone. Ask the user which one s/he wants to calculate, and take the appropriaterequired inputs. Then print the result. The input should be taken in the main function andcalculations for every solid should be done in a separate function by passing appropriatearguments.

Example:

If the user chooses the option for cube, only one input is required i.e., the side. The volume is then calculated and printed.

If the user chooses the option for cuboid, only three inputs are required i.e., length, breadth and height. The volume is then calculated and printed

7. An Electricity board charges the following rates for use of electricity.

For the First 200 units : Rs 1 per unit

For the next 100 units : Rs 1.5 per unit

Beyond 300 units : Rs 2 Per unit.

Write a Program to read no of unit consumed and print out total charge amount.

8. Create a program that will compute the net salary based on the number of hours worked and their respective rate. If there is overtime, net salary is computed as salary plus overtime pay. Overtime pay is computed based on the number of hours' overtime and their respective overtime rate.

9. Write a guessing game where the user has to guess a secret number. After every guess the program tells the user whether their number was too large or too small. At the end the number of tries needed should be printed. It counts only as one try if they input the same number multiple times consecutively.

10.Write a program that takes the duration of a year (in fractional days) for an imaginary planet as an input and produces a leap-year rule that minimizes the difference to the planet's solar year.

TOTAL:30 PERIODS

COURSE OUTCOMES:

After Successful completion of the course the student will able to

- To apply good programming principles to the design and implementation
- To design, implement, debug and test programs using the fundamental elements

TEXT BOOKS:

1. Programming In Ansi C -by E. Balagurusamy
2. Let us C – by Yashavant P. Kanetkar

15UIT868	ARDUINO RASPBERRY PI	L	T	P	C
		1	0	0	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To Understand the fundamental concepts in Arduino and Raspberry Pi
- To Learn the Arduino programming language and IDE
- To Learn the Raspberry Pi programming language and IDE

List of Experiments:

1. Study and Install IDE of Arduino and it types
2. Arduino IDE for Blink LED
3. RGB LED
4. Temperature sensor
5. RFID (Radio-frequency identification)
6. MQTT (Message Queuing Telemetry Transport) protocol
7. Connecting Arduino to cloud
8. Study and Configure Raspberry Pi
9. WAP for LED blink
10. Dimming Light Using PWM
11. Connecting Arduino to Raspberry Pi
12. Connecting GPS to Raspberry Pi

Project:

Smart Connected Home – An Arduino (Or) Raspberry pi to connect your house to social media tools and give intelligence.

TOTAL:30 PERIODS

COURSE OUTCOMES:

After Successful completion of the course the student will able to

- Design and develop different control system with Arduino board
- Make use of the concepts in Raspberry Pi and develop different control system

HARDWARE / SOFTWARE REQUIREMENTS:

PC
Breadboard
Arduino Uno R3
RGB LED
LED
330Ω Resistor
Jumper Wires
Starter Kit for Raspberry Pi
Communication Shield
RFID 13.56 MHz / NFC Module for Arduino and Raspberry Pi

15UIT869	NO SQL	L	T	P	C
		1	0	0	1

PRE-REQUISITES:

COURSE OBJECTIVE:

- To acquire knowledge on variety of NoSQL databases
- To attain inquisitive attitude towards research topics in NoSQL databases

List of Experiments:

1. NoSQL : NoSQL Features, Types, Advantages
2. Mongo DB: Introduction, Architecture and Features
3. Download & Install Mongo DB on Windows
4. Install Mongo DB in Cloud: AWS, Google, Azure
5. Create Database & Collection in Mongo DB
6. CRUD Operations in Mongo DB
7. PHP Mongo DB Connectivity
8. Cassandra Features, Applications, Architecture and Data
9. Download & Install Cassandra
10. Cassandra CRUD Operations and Shell Commands
11. Cassandra Data Definition and Data Manipulation Commands
12. Cassandra CQL Clauses, Data types, User Data Types and Collection Data Types
13. Comparison of Cassandra with Mongo DB
14. Create a Simple Cassandra Cluster With 3 Nodes

TOTAL:30 PERIODS

COURSE OUTCOMES:

After Successful completion of the course the student will able to

- Analyze the NoSQL databases with each other and Relational Database Systems
- Demonstrate the knowledge of Document based Databases (Mongo DB) and Columnbased Databases (Cassandra)

15UIT870	PHP FUNDAMENTALS	L	T	P	C
		1	0	0	1

COURSE OBJECTIVES:

- Understand the PHP fundamentals and functions
- Design web pages using PHP

UNIT I INTRODUCTION TO PHP 5

Evaluation of PHP – Basic Syntax – Defining variable and constant – Php Datatype – Operator and Expression – Case Study

UNIT II DECISIONS AND LOOPS, FUNCTIONS, STRINGS AND ARRAYS 5

Decisions – Repetitive task with looping – Defining Functions – Call by value and Call by reference – Creating and accessing string – Formatting string – Accessing array element – Looping with Index based array – Case Study

UNIT III FILE HANDLING, FORMS AND DATABASE CONNECTIVITY 5

Working with Files and directories – Php Forms – Connection with Mysql Database – Performing basic database operation - Case Study

TOTAL: 15PERIODS

COURSE OUTCOMES:

After successful completion of the course the student will able to

- Create PHP Programs using decisions, loops, functions, strings and arrays.
- Develop simple web application using file handling, forms and Database connectivity using Mysql

TEXT BOOKS:

1. Vikramvaswani, “PHP – A Beginners Guide”, McGraw – Hill,2009
2. Steven Holzner, “PHP: The Complete Reference”, Tata McGraw Hill, 2007.

OPEN ELECTIVES

Course Code	Course Title	L	T	P	C
15UIT971	PC Troubleshooting	3	0	0	3
15UIT972	Social Networks	3	0	0	3
15UIT973	Cyber Forensics Technology	3	0	0	3
15UIT974	Animation Technology	3	0	0	3
15UIT975	Computer architecture	3	0	0	3
15UIT976	Fundamentals of Database Management Systems	2	0	2	3
15UIT977	Learning IT Essentials by Doing	3	0	0	3
15UIT978	Website Designing	3	0	0	3

15UIT971	PC TROUBLESHOOTING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Identify major components including motherboards, memory, drives, peripheral devices
- Introduce troubleshooting and maintaining the computer system
- Provide opportunities to develop basic techniques with respect the hardware of a computer system

UNIT I INTRODUCTION 9

Introduction – Computer Organization – Number Systems and Codes – Memory – ALU – CU Instruction prefect – Interrupts – I/O Techniques – Device Controllers – Error Detection Techniques – Microprocessor – Personal Computer Concepts – Advanced System Concepts – Microcomputer Concepts – OS – Multitasking and Multiprogramming – Virtual Memory – Cache Memory – Modern PC and User.

UNIT II PERIPHERAL DEVICES 9

Introduction – Keyboard – CRT Display Monitor – Printer – Magnetic Storage Devices – FDD – HDD – Special Types of Disk Drives – Mouse and Trackball – Modem – Fax Modem – CD Rom Drive – Scanner – Digital Camera – DVD – Special Peripherals.

UNIT III PC HARDWARE OVERVIEW 9

Introduction – Hardware BIOS DOS Interaction – The PC family – PC Hardware – Inside the System Box – Motherboard Logic – Memory Space – Peripheral Interfaces and Controllers – Keyboard Interface – CRT Display interface – FDC-HDC.

UNIT IV INSTALLATION AND PREVENTIVE MAINTENANCE 9

Introduction – system configuration – pre installation planning – Installation practice – routine checks – PC Assembling and integration – BIOS setup – Engineering versions and compatibility – preventive maintenance – DOS – Virus – Data Recovery.

UNIT V TROUBLESHOOTING 9

Introduction – Computer faults – Nature of faults – Types of faults – Diagnostic programs and tools – Microprocessor and Firmware – Programmable LSI's – Bus Faults – Faults Elimination process – Systematic Troubleshooting – Symptoms observation and analysis – fault diagnosis – fault rectification – Troubleshooting levels – FDD, HDD, CD ROM Problems.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of working principles of various hardware devices and functions of OS.
- Distinguish the characteristic features of various peripheral devices.
- Identify and analyze the problems on Internal and External components of Computer Hardware
- Apply the Installation procedures to maintain data security and integrity.
- Analyze the computer faults using various diagnosis techniques.

TEXT BOOKS:

1. Stephen J.Bigelow, “Trouble Shooting, Maintaining and Repairing PCs”, Tata McGraw-Hill, New Delhi, 2001.
2. Govindarajalu. B “IBM PC Clones Hardware, Troubleshooting and Maintenance”, TMH, 2nd Ed. 2002.

REFERENCE BOOKS:

1. Peter Abel, NiyazNizamuddin, “IMB PC Assembly Language and Programming”, Pearson Education, 2007.
2. Scott Mueller “Repairing PC’s”, PHI 1992.
3. Mike Meyers, “Introduction to PC Hardware and Troubleshooting”, Tata McGraw-Hill, 2003.
4. Craig Zacker& John Rourke, “The Complete Reference: PC Hardware”, Tata McGraw-Hill, New Delhi, 2001.

15UIT972	SOCIAL NETWORKS	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Understand the concept of social network
- Learn knowledge in market and strategic interaction in network
- Learn the effects of social networks

UNIT I INTRODUCTION TO SOCIAL NETWORK 9

Introduction: Motivation – Different Sources of Network Data – Types of Networks – Tools for Visualizing Network Data – Review of Graph Theory Basics.

UNIT II STRUCTURAL AND LOCATIONAL PROPERTIES 9

Structural Properties of Networks – Notions of Centrality – Cohesiveness of Subgroups – Roles and Positions – Structural Equivalence – Representation of Network Positions – Block Models.

UNIT III SOCIAL NETWORK ANALYSIS 9

Introduction to Web – Limitations of current Web – Development of Semantic Web – Emergence of the Social Web – Network analysis – Development of Social Network Analysis – Key concepts and measures in network analysis – Electronic Sources for network analysis – Electronic discussion networks, Blogs and online communities, Web-based networks – Applications of Social Network Analysis.

UNIT IV MARKET AND STRATEGIC INTERACTION IN NETWORK 9

Matching Market: Bipartite Graphs and Perfect Matching – Prices and Market – Clearing Property – Network Models of Markets with Intermediaries – Price Setting in Market – Social Welfare – Trader Profit. Bargaining and Power in Network – Power in Social Network – Results of Network Exchange Experts – Modeling with Network Exchange – Stable outcomes – Modeling with Network Exchange – Balanced outcomes.

UNIT V NETWORK DYNAMICS 9

Information Cascade - Networks Effects – The Economy with Network Effects Industries with Network goods – Advanced Materials for Positive Externalities – Power Laws –The Effect of Search Tools and recommendations.

TOTAL: **45PERIODS**

COURSE OUTCOMES:

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

- Understand the basics of social networks. (Understand)
- Apply the knowledge of structural and locational properties to find the roles and network positions (Apply)
- Analyze the concepts of web analysis (Analyze)
- Analyze the market and strategic interaction in social networks. (Analyze)
- Analyze the performance effects of dynamic networks. (Analyze)

TEXT BOOKS:

1. David Easley, Jon Kleinberg, "Networks, Crowds, and Markets: Reasoning about a Highly Connected World", Cambridge University Press, 1st Edition, 2010.
2. Stanley Wasserman, Katherine Faust," Social Network Analysis: Methods and Applications", Cambridge University Press, 2nd Edition, 1999.

REFERENCE BOOKS:

1. Charu C. Aggarwal, "Social Network Data Analytics", Springer, 1st Edition, 2011.
2. Dion Gohand Schubert Foo" Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively", IGI Global Snippet, 2008.
3. Max Chevalier, Christine Julien and Chantal Soule-Dupuy, "Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling", IGI Global Snippet, 2009.
4. John G. Breslin, Alexander Passant and Stefan Decker, "The Social Semantic Web", Springer, 1st Edition, 2009.

15UIT973	CYBER FORENSICS TECHNOLOGY	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To set high forensics and ethical standards for cyber security, digital and computer forensics
- To know the hackers and the counter measures against malicious attacks
- To know the Cyber Forensics to Law Enforcement

UNIT I INTODUCTION TO CYBER FORENSICS 9

Introduction: Information Security Investigations – Corporate Cyber Forensics – Scientific method in forensic analysis – Investigating large scale Data breach cases- Types of Computer Forensics Technology – Types of Military Computer Forensic Technology – Business Computer Forensic Technology – Internet Tracing Methods – Overview of Cyber Crime – Types of Cyber Crime.

UNIT II NETWORK FORENSIC INVESTIGATION 10

Network forensic and investigation - Log file as evidence – Network Traffic investigation – DNS Poisoning Techniques – Evidence Gathering from ARP Table – Evidence Gathering at the Data Link Layer: DHCP Database – Router Forensics – Investigating DoS Attacks – Types of DoS Attacks – Techniques to Detect DoS Attacks – Challenges in Investigating DoS Attacks.

UNIT III INTERNET AND EMAIL CRIME INVESTIGATION 10

Web Attacks Investigation – Types of Web Attacks – Overview of Web Logs – Investigating Web Attack – Investigating FTP Servers, IIS logs, Apache Logs – Investigating Static and Dynamic IP Addresses – Tools for Locating IP Addresses – Security Strategies for Web Applications. Internet Crime Investigation – Goals of Investigation – Steps for Investigating Internet Crime- Introduction to Tracking E-Mails – E-Mail Systems – E-Mail Crime – Identity Theft, Chain E-Mails, Phishing – E-Mail Spoofing – E-Mail Crimes Investigation – E- Mail Forensic Tools.

UNIT IV MOBILE FORENSICS 9

Mobile Forensics challenges – Cell Phone Crime – SIM Security – Mobile phone evidence extraction process – Mobile phones Potential evidence – Android security – Android Forensic Setup – Android Data Extraction Techniques – Android Data Recovery Techniques – Analyzing Mobile Malware – Overview of Forensic Tools

UNIT V CYBER CRIME LAW 7

Investigation of Cyber Crimes – Agencies for Investigation in India – Powers and Constitution Laws – Procedures followed by First Responders – Evidence Collection and Seizure Procedures of Digital mediums – Penalties Under IT Act – Offences Under IT Act – Cyber Regulation Appellate Tribunal

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Demonstrate the fundamentals of cyber Forensics technology and its types
- Make use of network components for forensic investigation
- Categories the internet and email crime investigation based on web attacks
- Examine the performance of mobile evidence extraction technique for android forensic
- Analyze the laws, acts and penalties of cybercrime regulation authorities

TEXT BOOKS:

1. Dave Gaza, Mathew Kane, "Computer Forensic Investigation Network Intrusions and Cyber Crime", EC-Council Press, USA, 1st Edition, 2010.
2. John R. Vacca, "Computer Forensic: Crime Scene Investigation", Charles River Media, USA, 2nd Edition, 2005.

REFERENCE BOOKS:

1. Dr. Darren, R. Heyes, "A Practical Guide to Computer Forensics Investigations", Pearson, USA, 1st Edition, 2014
2. Elogan Casey, "Handbook of Digital Forensics and Investigation", Elsevier, USA, 1st Edition, 2009.
3. SatishBommisetty, RohiTamma, HeatherMahalik, "Practical Mobile Forensics", PacktPublishing, UK, 1st Edition, 2014.
4. Ryder, RodneyD, "Guide to Cyber Law", Wadhwa Publishing, India, 3rd Edition, 2007.

15UIT974	ANIMATION TECHNOLOGY	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- Acquire skills in generating computer graphics and animated pictures
- Acquire skills and mastery in the use of different software producing graphics and animation.
- Impart real-life advertisement exposure in an organization

UNIT I FUNDAMENTALS 9

History of Animation, Introduction to Animation, Terms used in Animation, Types of Animation - Skills for Animation Artist - Basic Principles of Animation - Animator's Drawing Tools - Rapid Sketching & Drawing.

UNIT II ANIMATION 9

Developing Animation Character - Anatomy & Body Language - Introduction to equipment required for animation - Developing the characters with computer animation, D virtual drawing for animation, sequential movement drawing - Thumbnails, motion studies, drawing for motion - Essentials & qualities of good animation characters.

UNIT III 2D ANIMATION 9

Overview of Flash - Introduction to the flash interface - Setting stage dimensions, working with panels, panel layouts - Introduction to drawing and drawing tools in Flash - Panels - Description, modifying, Saving & deleting a panel - Layers & Views.

UNIT IV 3D ANIMATION 9

Introduction - Context for 3D Studio Max - Exploring the Max Interface - Controlling & Configuring the view ports - Working with Files, importing exporting - Creating & editing primitive objects.

UNIT V MODELING 9

Accessing sub objects and using modeling helpers - Introduction to modifier & using modifier stack - Drawing & Editing 2D Spines & shapes - Modeling with polygon & Patch - Using the Graphic Modeling & Painting with objects.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Apply the knowledge of principles of animation and techniques to create the own video and PPT creation.
- Apply the knowledge of computer animation to develop the characters.
- Select and apply the appropriate techniques to implement the 2D Animation.
- Select and apply the appropriate techniques to implement the 3D Animation.
- Apply the knowledge of modeling task to design an application..

TEXT BOOKS:

1. Chris Patmore," The Complete Animation course", Barons Educational Series, June 2010.
2. Robert R, Snow D, "Flash CS4 Professional Bible", Wiley Publication, 4th Edition, 2009.

REFERENCE BOOKS:

1. AlinGales,"FLASH MX For PC/Mac", Firewall Media, 2011.
2. Fred Halsall., "Multimedia Communications - Applications, Networks, Protocols & Standards", Pearson Education, 2009.
3. Kelly L. Murdock, "3ds Max- Bible", Wiley Publication, 3rd Edition, 2011.
4. Rajesh Maurya, “Computer Graphics”, Wiley Publications, 2nd Edition, 2010.

15UIT975	COMPUTER ARCHITECTURE	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand the basic structure and operation of a digital Computer
- To discuss in detail the operation of the arithmetic unit including the algorithms& implementation of fixed -point addition, subtraction, multiplication & Division
- To study in detail the different types of control and the concept of pipelining
- To study the hierarchical memory system including cache memories and virtual Memory
- To study the different ways of communicating with I/O devices and standard I/O Interfaces

UNIT I BASIC STRUCTURE OF COMPUTERS 9

Functional units - Basic operational concepts - Bus structures - Performance and Metrics - Memory Locations & addresses, Memory operations - Instructions and instruction sequencing - Hardware - Software Interface - Instruction set architecture - Addressing modes - RISC -CISC.

UNIT II COMPUTER ARITHMETIC 9

Addition and subtraction of signed numbers - Design of fast adders - Multiplication of positive numbers - Signed operand multiplication and fast multiplication - Integer division

UNIT III PROCESSOR AND CONTROL UNIT 9

Basic MIPS implementation - Building data path - Control Implementation scheme - Pipelining - Pipelined data path and control - Handling Data hazards & Control hazards - Superscalar Operation.

UNIT IV PARALLELISM 9

Instruction -level-parallelism - Parallel processing challenges - Flynn's classification -Hardware multithreading - Multi core processors

UNIT V MEMORY AND I/O SYSTEMS 9

Memory hierarchy - Memory technologies - Cache basics - Measuring and improving cache performance - Virtual memory, TLBs - Input/output system, programmed I/O, DMA and interrupts, Buses

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Summarize the basic components of a computer, including CPU, memories, and input/output, and their organization.
- Solve the arithmetic operations of binary number system
- Analyze pipelined control units
- Explain parallel processing concepts and its challenges
- Analyze the performance of various memory

TEXT BOOKS

1. David A. Patterson and John L. Hennessey, "Computer organization and design the hardware/ software interface", Morgan Kauffman, 5th Edition, 2014.
2. Carl Hamacher, ZvonkoVranesic and SafwatZaky, "Computer Organization", Tata McGraw Hill, 5th Edition, 2002.

REFERENCE BOOKS

1. William Stallings, "Computer Organization and Architecture", Pearson Education, 7th Edition, 2006.
2. Vincent P. Heuring, Harry F. Jordan, "Computer System Architecture", Pearson Education, 2nd Edition, 2005.
3. Govindarajalu, "Computer Architecture and Organization ", Design Principles and Applications, Tata McGraw Hill, New Delhi, 1st Edition, 2005.
4. John P. Hayes,"Computer Architecture and Organization", Tata McGraw Hill, 3rd Edition, 1998.

15UIT976	FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEMS	L	T	P	C
		2	0	2	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram
- To make a study of SQL and relational database design
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design

UNIT I INTRODUCTION 10

Introduction to File and Database systems – Database system structure - Database users and administrator – Data models – Introduction to Network and Hierarchical Models – ER model – Introduction to Relational database.

UNIT II RELATIONAL MODEL 10

Relational Model – Types – Keys- Relational Algebra – Fundamental Operations and Additional Operations – SQL – Data Definition – Queries in SQL – Updates – Views – Integrity and Security – Relational Database design – Functional Dependences and Normalization for Relational Databases.

UNIT III DATA STORAGE AND QUERY PROCESSING 10

Record storage and Primary file organization – Secondary Storage Devices – Operations on Files – Heap File – Sorted Files – Indexing and Hashing Techniques – RAID – Query Processing – Overview – Cost estimation.

LIST OF EXPRIMENTS: 30

1. Data Definition, Table Creation, Constraints.
2. Insert, Select Commands, Update & Delete Commands.
3. Nested Queries & Join Queries
4. Views
5. High level programming language extensions (Control structures, Procedures and Functions).
6. Front end tools
7. Forms
8. Triggers
9. Menu Design
10. Reports.

TOTAL: 30+30PERIODS

COURSE OUTCOMES:

- Understand fundamentals of data models and database system using ER diagram.
- Apply the SQL query in relational database
- Choose an appropriate normalization techniques
- Analyze various storage techniques.
- Apply query processing techniques

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, Sudharshan. S, “Database System Concepts”, Tata McGraw Hill, 5th Ed.,2006.
2. Date C.J. Kannan A, Swamynathan S, “An Introduction to Database Systems”, Pearson Education, 8th Ed., 2006.

REFERENCE BOOKS:

1. RamezElmasri, Shamkant B. Navathe, “Fundamentals of Database Systems”, Pearson Addision Wesley,4th Ed., 2007.
2. Raghu Ramakrishnan, "Database management Systems", Tata McGraw Hill, 3rd Ed.
3. Singh.S.K,"Database Systems Concpets, Design and Applications", Pearson Education, 1st Ed, 2006
4. Hector Garcia-Molina, Jeffrey D.Ullman, Jennifer Widom, "Database System: The Complete Book", Pearson Education, 4th Ed., 2009

15UIT977	LEARNING IT ESSENTIALS BY DOING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To describe the working of Internet based applications
- To design and develop demos using Alice tool
- To design and test simple programs in C language
- To document artifacts using common quality standards
- To design simple data store using RDBMS concepts and implement
- To develop a working website with all above learning

UNIT I COMPUTER ARCHITECTURE 9

Fundamentals of Computer architecture – Introduction – Organization of a small computer Central Processing Unit – Execution cycle – Instruction Categories- Measure of CPU Performance Memory – Input/Output devices – BUS – addressing modes. System Software – Assemblers – Loaders and linkers – Compilers and Interpreters Operating system – introduction –memory management schemes Process management Scheduling – threads

UNIT II PROBLEM SOLVING 9

Problem solving with algorithms – Programming styles – Coding Standards and Best practices – Introduction to C Programming Testing and Debugging. Code reviews System Development Methodologies – Software development Models User interface Design – introduction – The process – Elements of UI design & reports.

UNIT III DATA PROCESSING 9

RDBMS – data processing – the database technology – data models ER modeling Concept – notations – Extended ER features Logical database design –normalization SQL – DDL statements – DML statements –DCL statements Writing Simple queries – SQL Tuning techniques – Embedded SQL – OLTP.

UNIT IV OBJECT ORIENTED ANALYSIS 9

Objected oriented concepts – object oriented programming UML Class Diagrams – relationship – Inheritance – Abstract classes – polymorphism Object Oriented Design methodology – Common Base class Alice Tool – Application of OOC using Alice tool.

UNIT V NETWORKING 9

Client server computing – Internetworking – Computer Networks – Working with TCP/IP – IP address – Sub netting – DNS – VPN – proxy servers World Wide Web – Components of web application – browsers and Web Servers URL – HTML – HTTP protocol – Web Applications – Application servers – Web Security.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- Describe working of Internet based applications
- Design and develop demos using Alice tool
- Design and test simple programs in C language
- Document artifacts using common quality standards
- Design simple data store using RDBMS concepts and implement
- Develop a working website with all above learning

TEXT BOOKS

1. Andrew S. Tanenbaum, “Structured Computer Organization”, PHI, 3rd Edition, 1991.
2. Silberschatz and Galvin,” Operating System Concepts”, Addision – Wesley, 4th Edition, 1995.

REFERENCE BOOKS:

1. Dromey R.G,” How to solve it by Computers”, PHI, 1992.
2. Kernighan, Ritchie,” ANSI C language”, PHI, 1992.
3. Wilbert O. Galitz,” Essential Guide to User Interface Design”, John Wiley, 1997.
   Alex Berson,” Client server Architecture”, Mc Grew Hill International, 1994.

15UIT978	WEBSITE DESIGNING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To design a stylistic webpage using HTML and CSS
- To know the basic knowledge of word press and Dreamweaver
- To validate webpage creation using java script and PHP

UNIT I HTML BASICS 8

Basic HTML - History - Page Structure - Block Elements – Inline Elements, More HTML Elements - List - Tables – Forms - Linking Web Pages.

UNIT II CASCADING STYLE SHEETS FOR STYLING 10

Introduction to CSS – Importing a Style sheet - Embedded Style sheet - CSS Rules –Style Types - External, Internal and Inline Style sheets - CSS Selectors.

UNIT III WORD PRESS & ADOBE DREAMWEAVER 8

Word press: Word press Introduction - Working with word press - understanding the loop - Template tags - Customizing the loop - Data Management - Project in Word press. Adobe Dreamweaver: Introduction – Design and layout tools - Code Navigator - HTML and CSS Starter Pages - Creating a new site - Adding Text and Images - Styling Your Pages with CSS.

UNIT IV CLIENT-SIDE PROGRAMMING - JAVA SCRIPT 10

Exploring JavaScript - Expressions and control flow in Java Script - Functions - Objects - Arrays - Validating User Input with Java Script.

UNIT V SERVER-SIDE PROGRAMMING - PHP 9

Introduction of PHP - Basic Syntax – Expressions and Control flow in PHP - PHP functions and objects - PHP arrays - Accessing MySql using PHP

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the knowledge of HTML to create webpage
- Make use of CSS style sheet for a web application
- Design and manage pages and posts using Word press and Adobe Dreamweaver
- Identify and Analyze client side programming using java script
- Analyze the server side programming using PHP and identify the database connection

TEXT BOOKS:

1. Learning PHP, MySQL, JavaScript,and CSS ,second edition by Robin Nixon, 2nd edition, 2012.
2. Marty Stepp, Jessica Miller, and Victoria Kirst , “Web Programming”, Step by Step Publication, 2nd edition, 2009
3. B.Williams, D.Damstra,H.Stern,“Professional WordPress: Design and Development”, Wiley Publication, 3rd Edition
4. Jeremy Osborn, Greg Heald, “Adobe Dreamweaver CS6 Digital Classroom”, Wiley Education, 2016.

REFERENCE BOOKS:

1. H.M.Deitel, P.J.Deitel, Goldberg, "Internet & World Wide Web How To Program", Pearson Education, Third Edition, 2006.
2. Robert. W. Sebesta, "Programming the World Wide Web", Pearson Education, Seventh Edition, 2012.
3. Kogent Learning Solutions Inc., “Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book”, Dreamtech Press.
4. http://www.w3schools.com

MANDATORY COURSES

Course Code	Course Title	L	T	P	C
15UGS331	Value Education and Human Rights	2	0	0	P/F
	Personality and Social development 1. PSD01 Sports and other Extra – Curricular Activities 2. PSD02 National Service Scheme 3. PSD03 Club Activities				P/F
	Skill Development Courses 1. SD01 Co-Curricular Activities 2. SD02 English Proficiency Certification 3. SD03 Foreign Languages 4. SD04 Soft Skills and Aptitude 5. SD05 Aptitude Proficiency Certificate 6. SD06 Intellectual Property Rights				P/F

15UGS331	VALUE EDUCATION AND HUMAN RIGHTS	L	T	P	C
		2	0	0	P/F

PRE-REQUISITE:

COURSE OBJECTIVES :

- To inculcate the values of Humanism, Culture and to have an awareness of Human Rights
- To impart knowledge and develop a sensitivity to the diverse Indian culture

UNIT I **6**

Introduction – Value education - Definition - Why values? - need for inculcation - sources of values- Personal values, Social values, Professional values, Moral values and Behavioral values.

UNIT II **6**

Values needed for life - love & Compassion, Truth & Tolerance, Fairness & Obedience – Respect Empathy – Protection – Humility & Harmony – Principles of happy living – Stress management

UNIT III **6**

Social values and personality – Role models – National leaders – freedom fighters, Social reformers & Value based anecdotes

UNIT IV **6**

Social values-Five responsibilities: to self family, environment, society and universe- peace within, family & universe; Unethical standards in words and how to correct in deeds, in thought, its deleterious effects in society, deterioration of culture and traditional values- remediation for better understanding of such values and its implications

UNIT V **6**

Human Rights – Universal Declaration of human rights - Human Rights violation - National Integration – Peace and non violence – the role of media in value building - Consumer awareness-Case Study

TOTAL:30PERIODS

COURSE OUTCOMES:

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

- Acquire a holistic vision and growth to become an integrated personality.
- Imbibe the essence of spirituality by which they will manifest the noble virtues of a universal brotherhood and benevolence

TEXT BOOKS:

1. S. Ignachimuthu, Values for Life, St.Paul Publications, Mumbai, 1994

REFERENCE BOOKS:

1. Frankena, W.K., “Ethics ”, Prentice Hall of India,,New Delhi, 1990.
2. Meron Theodor,“Human Rights and International Law Legal Policy Issues”, OxfordUniversity Press, First Edition, New Delhi, 2000.
3. R.P.Shukla, “Value Education and Human Rights, Sarup and Sons Publishing, New Delhi, 2004.
4. Yogesh Kumar Singh and ReschikaNath.“Value Education”. APH Publishing Corporation, New Delhi, 2005.