NANDHA ENGINEERING COLLEGE

(An Autonomous Institution affiliated to Anna University Chennai and approved by AICTE, New Delhi)
Erode-638 052, Tamilnadu, India, Phone: 04294 – 225585

Curriculum and Syllabi
for
B.Tech – Information Technology [R15]
(5th to 8th Semesters)

(This Curriculum and Syllabi are applicable to Students admitted from the academic year 2015-2016 and 2016-2017)

JUNE 2018

Approved by Sixth Academic Council

IT Department PEOs and POs

PROGRAMME EDUCATIONAL OBJECTIVEs:

PEO1: To afford students with knowledge environment in mathematical, scientific and basic engineering basics necessary to evaluate, analyze and solve hardware/software engineering problems.

PEO2: To provide our graduates with core proficiency awareness of the life-long learning needed for a successful specialized career.

PEO3: To scrutinize real life problems, design and develop solutions through the knowledge of basic computing and management principles that are publicly acceptable.

PEO4: To apply multifaceted skills for employment and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes.

PEO5: To create an interest for self learning, updating recent developments in the major area of study by way of inplant training and industrial visit and motivating to present in national / international forums for dissemination of knowledge.

PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO 1: Ability to apply the acquired knowledge of basic skills, principles of computing, mathematical foundations, algorithmic principles, modelling and design of computer- based systems in solving engineering Problems.

PSO 2: Ability to understand and analyze the interdisciplinary problems for developing innovative sustained solutions with environmental concerns.

PSO 3: Ability to update knowledge continuously in the tools like Rational Rose, Argo UML, WinRunner, Dreamweaver and technologies like Security, Computing, and Cryptography to meet the industry requirements.

PSO 4: Ability to manage effectively as part of a team with professional behavior and ethics.

PROGRAM OUTCOMES:

At the end of a programme a students will be able to demonstrate ability to

a-l	GRADUATE ATTRIBUTEs	PO No.	PROGRAMME OUTCOMEs
a	Engineering Knowledge	PO1	An ability to apply knowledge in Mathematical Problem solving, general engineering and Electrical Sciences.
b	Problem Analysis	PO2	Knowledge in contemporary issues and ability to analyze a problem, identify and define the computing requirements appropriate to its solution.
c	Design and Development of Solutions	PO3	An ability to design system components or process to satisfy the needs of the society within realistic constrains such as economical, social, political, ethical, health, safety and manufacturing .
d	Investigation of Complex Problems	PO4	An Ability to produce cost effective, quality and maintainable software products and solutions meeting the global standards.
e	Modern Tool Usage	PO5	An ability to apply techniques, skills and modern engineering tools required for IT applications.
f	The Engineer and Society	PO6	An ability to inculcate, the soft skills and an ability to perform in multidisciplinary areas.
g	Environment and Sustainability	PO7	An Ability to design and develop hardware and software in emerging technology environments with required domain knowledge.
h	Ethics	PO8	An ability to apply professional and ethical principles with responsibility.
i	Individual and Team Work.	PO9	An ability to function in multidisciplinary teams exhibiting innate abilities towards team building.
j	Communication	PO10	An ability to communicate effectively.
k	Project Management and Finance	PO11	An ability to apply, design and implement application oriented projects.
l	Lifelong Learning	PO12	An ability to engage in independent and lifelong learning in the broadest context of technological change.

NANDHA ENGINEERING COLLEGE (AUTONOMOUS), ERODE – 638 052

REGULATIONS – 2015 CHOICE BASED CREDIT SYSTEM

B.TECH INFORMATION TECHNOLOGY

CURRICULAM: I - VIII SEMESTERS SYLLABUS: I TO VI SEMESTERS

SEMESTER: I								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	15EY101	Communicative English	HS	3	1	0	2	2
2.	15MY102	Linear Algebra, Analytical Geometry and Differential Calculus	BS	5	3	2	0	4
3.	15PY101	Engineering Physics	BS	3	3	0	0	3
4.	15CY101	Engineering Chemistry	BS	3	3	0	0	3
5.	15EC102	Digital Principles and System Design	ES	3	3	0	0	3
6.	15IT101	Computational Problem solving and C Programming	ES	3	3	0	0	3
PRACTICALS								
7.	15GY111	Physics and Chemistry Laboratory I	BS	4	0	0	4	2
8.	15EC111	Digital Laboratory	ES	2	0	0	2	1
9.	15IT111	Computer Programming Laboratory	ES	2	0	0	2	1
10.	15GY112	Soft Skills - I	EEC	2	0	0	2	1
			TOTAL	**30**	**16**	**2**	**12**	**23**

SEMESTER: II								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	15EY201	Professional English	HS	3	1	0	2	2
2.	15MY202	Calculus and Laplace Transform	BS	5	3	2	0	4
3.	15PY202	Applied Physics	BS	3	3	0	0	3
4.	15CY201	Environmental Science and Engineering	HS	3	3	0	0	3
5.	15IT201	Advanced C and Data Structures	PC	3	3	0	0	3
6.	15MEC01	Engineering Graphics	ES	4	2	0	2	3
PRACTICALS								
7.	15GY211	Physics and Chemistry Laboratory - II	BS	4	0	0	4	2
8.	15IT211	Data Structures Laboratory	PC	2	0	0	2	1
9.	15GYC11	Engineering Practices Laboratory	ES	4	0	0	4	2
10.	15GY212	Soft Skills - II	EEC	2	0	0	2	1
			TOTAL	**33**	**15**	**2**	**16**	**24**

SEMESTER: III								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	15MY302	Fourier Analysis Integral Transforms and Partial Differential Equations	BS	5	3	2	0	4
2.	15IT301	Operating System Principles	PC	3	3	0	0	3
3.	15IT302	Object Oriented Programming using C++	PC	3	3	0	0	3
4.	15IT303	Analysis of Algorithms	PC	3	3	0	0	3
5.	15IT304	Fundamentals of Software Engineering	PC	3	3	0	0	3
6.	15IT305	Microprocessor and Interfacing	ES	3	3	0	0	3
PRACTICALS								
1.	15IT311	Operating System Principles Laboratory	PC	2	0	0	2	1
2.	15IT312	Object Oriented Programming using C++ Laboratory	PC	4	0	0	4	2
3.	15IT313	Microprocessor and Interfacing Laboratory	ES	3	0	0	2	1
4.	15GYC12	Soft Skills – Listening and Speaking	EEC	2	0	0	2	0
			TOTAL	**31**	**18**	**2**	**10**	**23**

SEMESTER: IV								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	15MY404	Probability and Queuing Theory	BS	5	3	2	0	4
2.	15IT401	Database Management Systems	PC	3	3	0	0	3
3.	15IT402	Programming with Java	PC	3	3	0	0	3
4.	15IT403	Computer Networks and Internets	PC	3	3	0	0	3
5.	15CS403	Computer Architecture and Organization	PC	3	3	0	0	3
6.	15IT404	Analog and digital communication	ES	3	3	0	0	3
PRACTICALS								
1.	15IT411	Database Management Systems Laboratory	PC	4	0	0	4	2
2.	15IT412	Programming with Java Laboratory	PC	2	0	0	2	1
3.	15IT413	Computer Network and Internets Laboratory	PC	2	0	0	2	1
4.	15GYC13	Soft Skills – Reading and Writing	EEC	2	0	0	2	0
			TOTAL	**30**	**18**	**2**	**10**	**23**

SEMESTER: V								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	15MY502	Numerical Methods and Operations Research	BS	5	3	2	0	4
2.	15EC504	Signal Processing	ES	3	3	0	0	3
3.	15IT501	Object Oriented System Design	PC	3	3	0	0	3
4.	15IT502	Internet and Web Programming	PC	5	3	0	2	4
5.	15GEC02	Engineering Economics and Financial Accounting	HS	3	3	0	0	3
6.	E1	Elective I (PE)	PE	3	3	0	0	3
PRACTICALS								
1.	15CS511	Case Tools Laboratory	PC	4	0	0	4	2
2.	E1L	Elective I (PE) Laboratory	PE	4	0	0	4	2
3.	15GY511	Soft Skills Aptitude And Reasoning – I	EEC	2	0	0	2	0
			TOTAL	**32**	**18**	**2**	**12**	**24**

SEMESTER: VI								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	15IT601	Compiler Design	PC	3	3	0	0	3
2.	15ITC02	Internet of Things – Enabling Technology	ES	3	3	0	0	3
3.	15IT602	C# and .NET	PC	5	3	0	2	4
4.	15IT603	Cryptography and network Security	PC	3	3	0	0	3
5.	E2	Elective II (PE)	PE	3	3	0	0	3
6.	E3	Elective III (PE)	PE	3	3	0	0	3
PRACTICALS								
1.	15IT611	Internet of Things Laboratory	ES	4	0	0	4	2
2.	E2L	Elective I (PE) Laboratory	PE	4	0	0	4	2
3.	15GE611	Comprehension	PC	2	0	0	2	1
4.	15GY611	Soft Skills Aptitude And Reasoning – II	EEC	2	0	0	2	0
			TOTAL	**32**	**18**	**0**	**14**	**24**

SEMESTER: VII								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	15IT701	Software Testing	PC	3	3	0	0	3
2.	E 4	Elective – IV (PE)	PE	3	3	0	0	3
3.	E 5	Elective – V (PE)	PE	3	3	0	0	3
4.	E 6	Elective – VI (PE)	PE	3	3	0	0	3
5.	E 7	Elective – VII (OE)	OE	3	3	0	0	3
PRACTICALS								
1.	15IT711	Software Testing Laboratory	PC	4	0	0	4	2
2.	15IT731	Project Work I	EEC	8	0	0	8	4
3.	15GE711	Personality and Character Development	EEC	2	0	0	1	0
			TOTAL	**21**	**15**	**0**	**13**	**21**

SEMESTER: VIII								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	E 8	Elective VIII (PE)	PE	3	3	0	0	3
2	E 9	Elective IX (OE)	OE	3	3	0	0	3
PRACTICALS								
1.	15IT831	Project Work II	EEC	16	0	0	16	8
			TOTAL	**22**	**6**	**0**	**16**	**14**

TOTAL NO. OF CREDITS: 23+24+23+23+24+24+21+14=176

PROFESSIONAL ELECTIVES (PE) - I								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15ITX01	Object Oriented Database Management System	PE	3	3	0	0	3
2.	15ITX02	Data Science and Big Data Analytics	PE	3	3	0	0	3
3.	15ITX03	Advanced Database Management System	PE	3	3	0	0	3
4.	15ITX04	Relational Database Management system using DB2	PE	3	3	0	0	3

PROFESSIONAL ELECTIVES (PE) - II								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
5.	15ITX05	Programming with PHP	PE	3	3	0	0	3
6.	15ITX06	Programming with Python	PE	3	3	0	0	3
7.	15ITX07	Programming with JAVA 2 Enterprise Edition	PE	3	3	0	0	3
8.	15ITX08	Programming with Perl	PE	3	3	0	0	3

PROFESSIONAL ELECTIVES LABORATORY (PE) - I								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15ITW01	Object Oriented Database Management System Laboratory	PE	4	0	0	4	2
2.	15ITW02	Data Science and Big Data Analytics Laboratory	PE	4	0	0	4	2
3.	15ITW03	Advanced Database Management System Laboratory	PE	4	0	0	4	2
4.	15ITW04	Relational Database Management system using DB2 Laboratory	PE	4	0	0	4	2

PROFESSIONAL ELECTIVES LABORATORY (PE) - II								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
5.	15ITW05	Programming with PHP Laboratory	PE	4	0	0	4	2
6.	15ITW06	Programming with Python Laboratory	PE	4	0	0	4	2
7.	15ITW07	Programming with JAVA 2 Enterprise Edition Laboratory	PE	4	0	0	4	2
8.	15ITW08	Programming with Perl Laboratory	PE	4	0	0	4	2

PROFESSIONAL ELECTIVES (PE) III,IV,V,VI,VII								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
9.	15ITX09	Social network analysis	PE	3	3	0	0	3
10.	15ITX10	Datamining	PE	3	3	0	0	3
11.	15ITX11	Wireless Networks	PE	3	3	0	0	3
12.	15ITX12	Mobile Communication	PE	3	3	0	0	3
13.	15ITX13	Cloud computing	PE	3	3	0	0	3
14.	15ITX14	Ethical Hacking	PE	3	3	0	0	3
15.	15ITX15	Computer Graphics and Multimedia	PE	3	3	0	0	3
16.	15ITX16	Information Storage Management	PE	3	3	0	0	3
17.	15CSX14	Human Computer Interactions	PE	3	3	0	0	3
18.	15ITX17	Composing Mobile Apps	PE	3	3	0	0	3
19.	15ITX18	Building Enterprise Applications	PE	3	3	0	0	3
20.	15ITX19	Business Intelligence – Data Warehousing & analytics	PE	3	3	0	0	3
21.	15ITX20	Information Security Management	PE	3	3	0	0	3
22.	15ITX21	Finite Automata	PE	3	3	0	0	3
23.	15CSX20	Artificial Intelligence	PE	3	3	0	0	3
24.	15ITX22	Software Quality Assurance	PE	3	3	0	0	3
25.	15ITX23	Knowledge Management	PE	3	3	0	0	3
26.	15ITX24	Enterprise Resource Planning	PE	3	3	0	0	3
27.	15GEC03	Professional Ethics and Human Values	PE	3	3	0	0	3
28.	15GEC04	Total Quality Management	PE	3	3	0	0	3

OPEN ELECTIVES (OE)								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15CEZ01	Energy conservation in buildings	OE	3	3	0	0	3
2.	15CEZ02	Waste Management	OE	3	3	0	0	3
3.	15CEZ03	Air Pollution Management	OE	3	3	0	0	3
4.	15CEZ04	Building Services	OE	3	3	0	0	3
5.	15CSZ01	Software Engineering Methodologies	OE	3	3	0	0	3
6.	15CSZ02	Design Thinking	OE	3	3	0	0	3
7.	15CSZ03	Open Source Software	OE	3	3	0	0	3
8.	15CSZ04	Information Security	OE	3	3	0	0	3
9.	15ECZ01	Avionics	OE	3	3	0	0	3
10.	15ECZ02	Consumer Electronics	OE	3	3	0	0	3
11.	15ECZ03	Modern wireless communication system	OE	3	3	0	0	3
12.	15ECZ04	Electronic Testing	OE	3	3	0	0	3
13.	15EEZ01	Renewable Energy Technology	OE	3	3	0	0	3
14.	15EEZ02	Energy Conservation and Auditing	OE	3	3	0	0	3
15.	15EEZ03	Electrical Machines	OE	3	3	0	0	3
16.	15EEZ04	Wind and Solar Electrical Systems	OE	3	3	0	0	3
17.	15EIZ01	Autotronix	OE	3	3	0	0	3
18.	15EIZ02	Fiber Optic Sensors	OE	3	3	0	0	3
19.	15EIZ03	Industrial Automation	OE	3	3	0	0	3
20.	15EIZ04	Ultrasonic Instrumentation	OE	3	3	0	0	3
21.	15ITZ01	PC Hardware and Trouble Shooting	OE	3	3	0	0	3
22.	15ITZ02	Cyber Crime Investigations and Digital Forensics	OE	3	3	0	0	3
23.	15ITZ03	Developing Mobile Apps	OE	3	3	0	0	3
24.	15ITZ04	Software Project Management	OE	3	3	0	0	3
25.	15MEZ01	Six Sigma	OE	3	3	0	0	3
26.	15MEZ02	Project Management	OE	3	3	0	0	3
27.	15MEZ03	Electric Vehicle Technology	OE	3	3	0	0	3
28.	15MEZ04	Value Engineering	OE	3	3	0	0	3
29.	15MYZ01	Mathematical Structures	OE	3	3	0	0	3
30.	15MYZ02	Optimization Techniques	OE	3	3	0	0	3
31.	15MYZ03	Statics for Engineers	OE	3	3	0	0	3
32.	15MYZ04	Statistics for Engineers	OE	3	3	0	0	3
33.	15PYZ01	Nanomaterials	OE	3	3	0	0	3
34.	15PYZ02	Nuclear physics and reactors	OE	3	3	0	0	3

35.	15PYZ03	Space science and technology	OE	3	3	0	0	3
36.	15CYZ01	Chemistry for engineers	OE	3	3	0	0	3
37.	15CYZ02	Soil chemistry	OE	3	3	0	0	3
38.	15CYZ03	Organic chemistry	OE	3	3	0	0	3

VALUE ADDED COURSE								
Sl. No	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15GEY01	Communicative Hindi	OE	2	2	0	0	0
2.	15GEY02	Fundamentals of German	OE	2	2	0	0	0
3.	15GEY03	Basics of Japanese	OE	2	2	0	0	0

HUMANITIES AND SOCIAL SCIENCES (HS)								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15EY101	Communicative English	HS	3	1	0	2	2
2.	15EY201	Professional English	HS	3	1	0	2	2
3.	15CY201	Environmental Science and Engineering	HS	3	3	0	0	3
4.	15GEC02	Engineering Economics and Financial Accounting	HS	3	3	0	0	3

BASIC SCIENCES (BS)								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15MY102	Linear Algebra, Analytical Geometry and Differential Calculus	BS	5	3	2	0	4
2.	15PY101	Engineering Physics	BS	3	3	0	0	3
3.	15CY101	Engineering Chemistry	BS	3	3	0	0	3
4.	15GY111	Physics and Chemistry Laboratory I	BS	4	0	0	4	2
5.	15MY202	Calculus and Laplace Transform	BS	5	3	2	0	4
6.	15PY202	Applied Physics	BS	3	3	0	0	3
7.	15GY211	Physics and Chemistry Laboratory II	BS	4	0	0	4	2
8.	15MY302	Fourier Analysis Integral Transforms and Partial Differential Equations	BS	5	3	2	0	4
9.	15MY404	Probability and Queuing Theory	BS	5	3	2	0	4
10.	15MY502	Numerical Methods and Operations Research	BS	5	3	2	0	4

ENGINEERING SCIENCES (ES)								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15EC102	Digital Principles and System Design	ES	3	3	0	0	3
2.	15IT101	Computational Problem solving and C Programming	ES	3	3	0	0	3
3.	15EC111	Digital Laboratory	ES	2	0	0	2	1
4.	15IT111	Computer Programming Laboratory	ES	2	0	0	2	1
5.	15MEC01	Engineering Graphics	ES	4	2	0	2	3
6.	15GYC11	Engineering Practices Laboratory	ES	4	0	0	4	2
7.	15IT305	Microprocessor and Interfacing	ES	3	3	0	0	3
8.	15IT313	Microprocessor and Interfacing Laboratory	ES	3	0	0	2	1
9.	15IT404	Analog and digital communication	ES	3	3	0	0	3
10.	15EC504	Signal Processing	ES	3	3	0	0	3
11.	15ITC02	Internet of Things – Enabling Technology	ES	3	3	0	0	3
12.	15IT611	Internet of Things Laboratory	ES	4	0	0	4	2

EMPLOYABILITY ENHANCEMENT COURSES (EEC)								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15GY112	Soft Skills – I	EEC	2	0	0	2	1
2.	15GY212	Soft Skills – II	EEC	2	0	0	2	1
3.	15GYC12	Soft Skills – Listening and Speaking	EEC	2	0	0	2	0
4.	15GYC13	Soft Skills – Reading and Writing	EEC	2	0	0	2	0
5.	15GY511	Soft Skills Aptitude And Reasoning – I	EEC	2	0	0	2	0
6.	15GY611	Soft Skills Aptitude And Reasoning – II	EEC	2	0	0	2	0
7.	15GE611	Comprehension	EEC	2	0	0	2	1
8.	15GE711	Personality and Character Development	EEC	2	0	0	1	0
9.	15IT731	Project work - I	EEC	8	0	0	8	4
9.	15IT831	Project work - II	EEC	16	0	0	16	8

PROFESSIONAL CORE (PC)								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15IT201	Advanced C and Data Structures	PC	3	3	0	0	3
2.	15IT211	Data Structures Laboratory	PC	2	0	0	2	1
3.	15IT301	Operating System Principles	PC	3	3	0	0	3
4.	15IT302	Object Oriented Programming using C++	PC	3	3	0	0	3
5.	15IT303	Analysis of Algorithms	PC	3	3	0	0	3
6.	15IT304	Fundamentals of Software Engineering	PC	3	3	0	0	3
7.	15IT311	Operating System Principles Laboratory	PC	2	0	0	2	1
8.	15IT312	Object Oriented Programming using C++ Laboratory	PC	4	0	0	4	2
9.	15IT401	Database Management Systems	PC	3	3	0	0	3
10.	15IT402	Programming with Java	PC	3	3	0	0	3
11.	15IT403	Computer Networks and Internets	PC	3	3	0	0	3
12.	15CS403	Computer Architecture and Organization	PC	3	3	0	0	3
13.	15IT411	Database Management Systems Laboratory	PC	4	0	0	4	2
14.	15IT412	Programming with Java Laboratory	PC	2	0	0	2	1
15.	15IT413	Computer Network and Internets Laboratory	PC	2	0	0	2	1
16.	15IT501	Object Oriented System Design	PC	3	3	0	0	3
17.	15IT502	Internet and Web Programming	PC	5	3	0	2	4
18.	15CS511	Case Tools Laboratory	PC	4	0	0	4	2
19.	15IT601	Compiler Design	PC	3	3	0	0	3
20.	15IT602	C# and .NET	PC	5	3	0	2	4
21.	15IT603	Cryptography and Network Security	PC	3	3	0	0	3
22.	15GE611	Comprehension	PC	2	0	0	2	1

24.	15IT701	Software Testing	PC	3	3	0	0	3

PROFESSIONAL ELECTIVES (PE)								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15ITX01	Object Oriented Database Management System	PE	3	3	0	0	3
2.	15ITX02	Data Science and Big Data Analytics	PE	3	3	0	0	3
3.	15ITX03	Advanced Database Management System	PE	3	3	0	0	3
4.	15ITX04	Relational Database Management system using DB2	PE	3	3	0	0	3
5.	15ITX05	Programming with PHP	PE	3	3	0	0	3
6.	15ITX06	Programming with Python	PE	3	3	0	0	3
7.	15ITX07	Programming with JAVA 2 Enterprise Edition	PE	3	3	0	0	3
8.	15ITX08	Programming with Perl	PE	3	3	0	0	3
9.	15ITW01	Object Oriented Database Management System Laboratory	PE	4	0	0	4	2
10.	15ITW02	Data Science and Big Data Analytics Laboratory	PE	4	0	0	4	2
11.	15ITW03	Advanced Database Management System Laboratory	PE	4	0	0	4	2
12.	15ITW04	Relational Database Management system using DB2 Laboratory	PE	4	0	0	4	2
13.	15ITW05	Programming with PHP Laboratory	PE	4	0	0	4	2
14.	15ITW06	Programming with Python Laboratory	PE	4	0	0	4	2
15.	15ITW07	Programming with JAVA 2 Enterprise Edition Laboratory	PE	4	0	0	4	2
16.	15ITW08	Programming with Perl Laboratory	PE	4	0	0	4	2
17.	15ITX09	Social network analysis	PE	3	3	0	0	3
18.	15ITX10	Datamining	PE	3	3	0	0	3
19	15ITX11	Wireless Networks	PE	3	3	0	0	3
20.	15ITX12	Mobile Communication	PE	3	3	0	0	3
21.	15ITX13	Cloud computing	PE	3	3	0	0	3
22	15ITX14	Ethical Hacking	PE	3	3	0	0	3
23	15ITX15	Computer Graphics and Multimedia	PE	3	3	0	0	3
24.	15ITX16	Information Storage Management	PE	3	3	0	0	3
25	15CSX14	Human Computer Interactions	PE	3	3	0	0	3
26	15ITX17	Composing Mobile Apps	PE	3	3	0	0	3
27	15ITX18	Building Enterprise Applications	PE	3	3	0	0	3

28	15ITX19	Business Intelligence – Data Waehousing and analytics	PE	3	3	0	0	3
29.	15ITX20	Information Security Management	PE	3	3	0	0	3
30	15ITX21	Finite Automata	PE	3	3	0	0	3
31	15CSX20	Artificial Intelligence	PE	3	3	0	0	3
32	15ITX22	Software Quality Assurance	PE	3	3	0	0	3
33	15ITX23	Knowledge Management	PE	3	3	0	0	3
34	15ITX24	Enterprise Resource Planning	PE	3	3	0	0	3
35	15GEC03	Professional Ethics and Human Values	PE	3	3	0	0	3
36	15GEC04	Total Quality Management	PE	3	3	0	0	3

OPEN ELECTIVES (OE)								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	15CEZ01	Energy conservation in buildings	OE	3	3	0	0	3
2.	15CEZ02	Waste Management	OE	3	3	0	0	3
3.	15CEZ03	Air Pollution Management	OE	3	3	0	0	3
4.	15CEZ04	Building Services	OE	3	3	0	0	3
5.	15CSZ01	Software Engineering Methodologies	OE	3	3	0	0	3
6.	15CSZ02	Design Thinking	OE	3	3	0	0	3
7.	15CSZ03	Open Source Software	OE	3	3	0	0	3
8.	15CSZ04	Information Security	OE	3	3	0	0	3
9.	15ECZ01	Avionics	OE	3	3	0	0	3
10.	15ECZ02	Consumer Electronics	OE	3	3	0	0	3
11.	15ECZ03	Modern wireless communication system	OE	3	3	0	0	3
12.	15ECZ04	Electronic Testing	OE	3	3	0	0	3
13.	15EEZ01	Renewable Energy Technology	OE	3	3	0	0	3
14.	15EEZ02	Energy Conservation and Auditing	OE	3	3	0	0	3
15.	15EEZ03	Electrical Machines	OE	3	3	0	0	3
16.	15EEZ04	Wind and Solar Electrical Systems	OE	3	3	0	0	3
17.	15EIZ01	Autotronix	OE	3	3	0	0	3
18.	15EIZ02	Fiber Optic Sensors	OE	3	3	0	0	3
19.	15EIZ03	Industrial Automation	OE	3	3	0	0	3
20.	15EIZ04	Ultrasonic Instrumentation	OE	3	3	0	0	3
21.	15ITZ01	PC Hardware and Trouble Shooting	OE	3	3	0	0	3
22.	15ITZ02	Cyber Crime Investigations and	OE	3	3	0	0	3

		Digital Forensics						
23.	15ITZ03	Developing Mobile Apps	OE	3	3	0	0	3
24.	15ITZ04	Software Project Management	OE	3	3	0	0	3
25.	15MEZ01	Six Sigma	OE	3	3	0	0	3
26.	15MEZ02	Essentials of Radio Frequency Identification	OE	3	3	0	0	3
27.	15MEZ03	Electric Vehicle Technology	OE	3	3	0	0	3
28.	15MEZ04	Value Engineering	OE	3	3	0	0	3
29.	15MYZ01	Mathematical Structure	OE	3	3	0	0	3
30.	15MYZ02	Optimization Techniques	OE	3	3	0	0	3
31.	15MYZ03	Statics for Engineers	OE	3	3	0	0	3
32.	15MYZ04	Statistics for Engineers	OE	3	3	0	0	3
33.	15PYZ01	Nanomaterials	OE	3	3	0	0	3
34.	15PYZ02	Nuclear physics and reactors	OE	3	3	0	0	3
35.	15PYZ03	Space science and technology	OE	3	3	0	0	3
36.	15CYZ01	Chemistry for engineers	OE	3	3	0	0	3
37.	15CYZ02	Soil chemistry	OE	3	3	0	0	3
38.	15CYZ03	Organic chemistry	OE	3	3	0	0	3

VALUE ADDED COURSES								
Sl. No	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1	15GEY01	Communicative Hindhi	OE	2	2	0	0	2
2	15GEY02	Fundamentals of German	OE	2	2	0	0	2
3	15GEY03	Basics of Japanese	OE	2	2	0	0	2

CREDIT DISTRIBUTION

SEM	HS	BS	PC	ES	EEC	PE	OE	TOTAL
I	2	12	0	8	1	0	-	**23**
II	5	9	4	5	1	0	-	**24**
III	0	4	15	4	0	0	-	**23**
IV	0	4	16	3	0	0	-	**23**
V	3	4	9	3	0	5	-	**24**
VI	0	0	11	5	0	8	-	**24**
VII	0	0	5	0	4	9	3	**21**
VIII	0	0	0	0	8	3	3	**14**
TOTAL	**10**	**33**	**60**	**28**	**14**	**25**	**6**	**176**

TOTAL NO. OF CREDITS: 23+24+23+23+24+24+21+14=176

15EY101 COMMUNICATIVE ENGLISH
(Common to All Branches)

L	T	P	C
1	0	2	2

OBJECTIVES:

- To improve their lexical, grammatical and communicative competence.
- To enhance their communicative skills in real life situations.
- To assist students understand the role of thinking in all forms of communication.
- To equip students with oral and appropriate written communication skills.
- To assist students with employability and job search skills.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Express their opinions clearly, speak convincingly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.

CO2 Explain effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.

CO3 Relate different genres of texts infer implied meanings and critically analyze and evaluate them for ideas as well as for method of presentation.

CO4 Infer unspoken and implied meanings and comprehend different spoken excerpts critically.

CO5 Develop their professional communication skills.

UNIT I: GRAMMAR **(9)**

Parts of Speech – Basic sentence structures- Types of sentences- Auxiliary verbs – Modal Auxiliaries- Articles - Prepositions –Tenses - Voices - Subject-Verb Agreement – Different Grammatical forms of the same word.

UNIT II: VOCABULARY **(9)**

Synonyms – Antonyms – One Word Substitution – Words often Confused - Compound nouns- Countable and Uncountable Nouns–Spelling rules - Homophones and Homonyms.

UNIT-III: CONVERSATIONAL SKILLS **(9)**

Strategies for Good Conversation – Improving fluency and Self Expression – Articulation – Voice quality – Role-play – One minute talk.

UNIT IV: COMPREHENSIVE LISTENING AND READING **(9)**

Effective listening Strategies – Listening to Speeches and Lectures – Listening to Announcements – Listening and Gap Filling – Listening to Interviews – Reading Comprehension (Extensive Reading).

UNIT V: TECHNICAL WRITING **(9)**

Interpretation of Data – Highlighting problems & suggesting solution – Apology Letter – Inviting Dignitaries – Permission to undergo Industrial visit – Jumbled Sentences.

TOTAL (L:45) =45 PERIODS

TEXT/ REFERENCES BOOKS

1. Rizvi, Ashraf.M, “Effective Technical Communication”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2006.
2. Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006
3. Hewings. M, “Advanced English Grammar”, Cambridge University Press, Chennai, 2000.
4. Raman M & Sangeetha Sharma, “Technical Communication”, Oxford University Press, USA, 2005.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x		x
3									x	x		
4									x	x		x
5									x	x		x

15MY102 - LINEAR ALGEBRA, ANALYTICAL GEOMETRY AND DIFFERENTIAL CALCULUS

(Common to CSE & IT Branches)

L	T	P	C
3	2	0	4

OBJECTIVES:

- Identify, formulate and solve Engineering problems.
- Use the techniques, Skills and Engineering tools necessary for engineering practice.
- Learn further topics of Mathematics in higher semesters in a graded manner.
- Appreciate the important role of Mathematical concepts in engineering applications.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Be capable of identifying algebraic Eigen value problems from practical areas and obtain the Eigen solutions in certain cases and to have acquired the technique of diagonalizing a matrix which would render the Eigen solution procedure very simple.

CO2 Have knowledge about the geometrical aspects of line, plane and sphere.

CO3 Understand effectively the geometrical aspects of curvature, involutes and evolutes of plane curves, essential concepts for an engineer, as elegant applications of differential calculus.

CO4 Understand and handle functions of more than one variable, from the points of view of their differentiation, expansions and extreme values, along with differentiation under integral sign which are encountered in engineering studies.

CO5 Have learnt the method of solving differential equations of certain types, including systems of differential equations that they might encounter in their studies of other subjects in the same or higher semesters.

UNIT I: LINEAR ALGEBRA **(9)**

Characteristic equation-Eigen values and Eigen vectors of a real matrix- Cayley Hamilton Theorem (Excluding proof) - Orthogonal transformation of a symmetric matrix to diagonal form - Quadratic form -Nature of Quadratic form.

UNIT II: THREE DIMENSIONAL ANALYTICAL GEOMETRY **(9)**

Direction cosines and ratios– Angle between two lines – Equation of a plane –Angle between two planes-Equation of a straight line – Coplanar lines –skew lines – Equation of a sphere – Plane section of a sphere – Equation of a tangent plane – Orthogonal spheres.

UNIT III: GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS **(9)**

Curvature – Curvature in Cartesian and polar co-ordinates-Centre and Radius of curvature-Circle of curvature-Evolutes and Involutes-Envelopes-Evolutes as envelope of normal's.(Simple and Standard Questions be asked).

UNIT IV: FUNCTIONS OF SEVERAL VARIABLES **(9)**

Partial derivatives - Total differential-Differentiation of implicit functions-Taylor's expansion-Maxima and Minima-Constrained Maxima and Minima by Lagrange's multiplier method-Jacobians.

UNIT V: ORDINARY DIFFERENTIAL EQUATIONS **(9)**

Higher order linear differential equations with constant coefficients - Method of variation of parameters – Cauchy's and Legendre's equations.

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

TEXT BOOKS:

1. Dr.B.S.Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna publications, 2012.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Edition, John Wiley & sons, 2013.
3. Veerarajan.T, "Engineering Mathematics for first year", Third Edition,Tata McGraw Hill,2011.

REFERENCES:

1. N.P.Bali, Manish Goyal, "A text book of Engineering Mathematics: Sem-II", 5th Edition, Laxmi Publications.2011.
2. P.Kandasamy, K.Thilagavathy,K.Gunavathy,"Engineering Mathematics for first Year", 9th Rv. Ed., S.Chand & Co Ltd, 2013.
3. Glyn James, "Advanced Engineering Mathematics", 7thEdition, Wiley India, (2007).
4. Dr. M.K.Venkataramaan, "Engineering Mathematics", The National Publication co., Chennai, 2003.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x						x					
2	x	x	x				x				x	
3	x	x					x				x	
4	x	x	x				x		x		x	
5	x						x					

15PY101 - ENGINEERING PHYSICS
(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide the basic ideas in large number of engineering subjects
- To develop the skills of the students in physics under various applications
- To provide the ideas of optics and laser technology
- To develop the ideas to design optical fiber sensors
- To Provide knowledge in wave and particle physics

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Acquire knowledge regarding Acoustics and ultrasonic
CO2 Applying knowledge in the fields of optics & laser technology
CO3 Design the sensors using the knowledge of fiber optics
CO4 Understand the knowledge of wave, particle nature and matter waves
CO5 Analyze the different kind of crystal structures and gain knowledge about crystal growth.

UNIT I - ACOUSTICS & ULTRASONCIS (9)

Classification of sound – characteristics of musical sound – loudness – Weber – Fechner law – absorption coefficient – reverberation – reverberation time – Sabine's formula (growth & decay). Factors affecting acoustics of buildings and their remedies. Ultrasonic: Introduction - properties of ultrasonics- magnetostriction - piezo electric methods. Medical application: Sonogram - Engineering Application: Ultrasonic A B C scan methods

UNIT II - OPTICS & LASER TECHNOLOGY (9)

Interference: Air wedge – theory – uses – testing of flat surfaces – determination of thickness of a thin wire. Types of lasers – Nd – YAG laser – CO_2 laser – semiconductor laser (homojunction & hetrojuction). Applications: Determination of particle size using laser - Holography – construction – reconstruction – Lasers in industry (Material Processing) and Medical field (Surgery)

UNIT III - FIBER OPTICS AND SENSORS (9)

Principle of light transmission through fiber - expression for acceptance angle and numerical aperture – Fabrication of optical fibers- Double crucible method - types of optical fibers (material, refractive Index profile and mode) fiber optic communication system. Splicing – Applications of optical fiber - Sensors- temperature- pressure sensor and displacement sensor Medical Endoscope.

UNIT IV - WAVE AND PARTICLE PHYSICS (9)

Development of quantum theory – de Broglie wavelength – properties of matter waves - G.P Thomson experiment - Schrödinger's wave equation – time dependent – time independent wave equations – physical significance – applications – particle in a one dimensional potential box - Compton Effect – theory and experimental verification.

UNIT V - CRYSTALOGRAPHY (9)

Lattice – unit cell – Bravais lattices – lattice planes – Miller indices – 'd' spacing in cubic lattice – calculation of number of atoms per unit cell – atomic radius – coordination number – packing factor for SC, BCC, FCC and HCP structures – Crystal growth techniques- solution, melt (Czochralski) and vapour growth techniques(qualitative)

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. V. Rajendran, Engineering Physics, Tata McGraw-Hill, New Delhi, 2011.
2. K. Tamilarasan, K. Prabu, Engineering Physics I, Second Edition, Tata McGraw-Hill. New Delhi. 2011.
3. Senthilkumar. G Engineering Physics I VRB Publishers, 2011.

REFERENCES:

1. P. K. Palanisami, Physics for Engineers, Vol. 1, Scitech Pub. (India) Pvt. Ltd., Chennai, 2002.
2. M. N. Avadhanulu and P. G. Kshirsagar, A Textbook of Engineering Physics, S. Chand & Company Ltd., New Delhi, 2005.
3. V. Rajendran and A. Marikani, Physics I, TMH, New Delhi, 2004.
4. R. K. Gaur and S. L. Gupta, Engineering Physics, Dhanpat Rai Publishers, New Delhi, 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x			x			x	x	x
2	x	x	x	x		x	x			x	x	x
3	x			x	x		x	x		x	x	x
4	x	x										
5	x	x								x		

15CY101 - ENGINEERING CHEMISTRY
(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- Become conversant with the principles of water characterization and treatment of potable and industrial purposes.
- Study about the principles of electrochemistry, energy storage devices, principles of corrosion control and chemical kinetics.
- Principles of polymer chemistry and Engineering applications of polymers and adsorption.
- Study about the surface chemistry.
- Gain well founded knowledge of chemistry of fuels and lubricants.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Apply knowledge of fundamental principles of chemistry.
CO2 Define and solve engineering problems, including the utilization of creative and innovative skills.
CO3 Gain practical experience with chemical process equipment as well as to analyze and interpret data.
CO4 Understand the impact of engineering solutions in a global, economic, environmental and societal content.
CO5 Gain the knowledge about fuels and lubricants.

UNIT-I WATER TECHNOLOGY **(9)**

Hardness-types,- estimation by EDTA method - domestic water treatment - disinfection methods (chlorination, ozonation and UV treatment) - boiler troubles (scale, sludge, priming, foaming and caustic embrittlement) - external conditioning - demineralization process - desalination - reverse osmosis method. Determination of Fe in water by colorimetry - determination of sodium in water by flame photometry.

UNIT-II ELECTROCHEMISTRY AND CORROSION **(9)**

Electrochemistry - electrode potential - - reference electrode - standard hydrogen electrode (SHE) and calomel electrode - Nernst equation and problems, potentiometric titration (redox). Conductance measurements - conductometric titration (acid-base). Batteries - types,- lead acid battery. Corrosion - Chemical corrosion - electrochemical corrosion - corrosion control - sacrificial anode method.

UNIT-III POLYMERS AND NANOMATERIALS **(9)**

Polymers – classification, addition, condensation and co polymerization - plastics - thermoplastics and thermosetting plastics - preparation , properties and uses of PVC, PET, Teflon and nylon. Polymer processing – compression and injection moulding techniques. Nano-materials - Carbon nanotubes - synthesis and their applications.

UNIT-IV CHEMICAL KINETICS AND SURFACE CHEMISTRY **(9)**

Order of a reaction (definition) - kinetics of first order reaction – acid catalysed hydrolysis of ester, - kinetics of second order reaction – base catalysed hydrolysis of ester - Arrhenius equation - effect of temperature on reaction rate - Surface chemistry: Adsorption - types of adsorption - Langmuir adsorption isotherm – role of adsorption in catalytic reactions.

UNIT-V FUELS AND LUBRICANTS **(9)**

Fuels: Coal - proximate analysis - metallurgical coke - manufacture by Otto-Hoffmann method. Liquid fuels - knocking - octane number and cetane number - synthetic petrol - Fischer Tropsch and Bergius processes. Lubricants - properties– viscosity index, flash and fire points, cloud and pour points and oiliness – Flue gas analysis – Orsat apparatus.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. C.Jain and Monica Jain, Engineering Chemistry vol I & II, Dhanpat Rai Pub.Co., New Delhi,15th Edition (2013).
2. S.S.Dara, A Text book of Engineering Chemistry,S.Chand & Co.Ltd ., New Delhi(2014).
3. Dr.A.Ravikrishnan,Engineering chemistry I & Engineering chemistry II.,Sri Krishna Hitech Publishing co. Pvt .Ltd., Chennai,13 th Edition (2012).

REFERENCES:

1. N. Krishnamurthy, P. Vallinayagam and D. Madhavan, Engineering Chemistry, PHI learning private Ltd, New Delhi (2009).
2. B. Sivashankar , Engineering Chemistry, Tata McGraw-Hill Pub. Co. Ltd. New Delhi (2008).
3. R. Sivakumar and N. Sivakuamr, Engineering Chemistry, Tata McGraw-Hill publishing company limited, New Delhi (2009).

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											
2	x	x	x	x					x	x		x
3			x	x	x				x		x	x
4	x	x	x								x	x
5												

15EC102 - DIGITAL PRINCIPLES AND SYSTEM DESIGN
(Common to CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- Learn how to design digital circuits, by simplifying the Boolean functions.
- Give an idea about Combinational Circuit and HDL basics
- Design the Synchronous Sequential Circuits
- Design the Asynchronous Sequential Circuits
- Give an idea about designs using PLDs, and write codes for designing larger digital systems.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Know the different Logic gates used in Digital system and NAND/NOR implementation.
CO2 Simplify the Boolean equations by K-Map method.
CO3 Design/ test a Combinational and Sequential logic system using gates
CO4 Write HDL program for Digital Logic System design.
CO5 Design a complex system using PLDs.

UNIT I - BOOLEAN ALGEBRA AND LOGIC GATES **(9)**

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

UNIT II - COMBINATIONAL LOGIC **(9)**

Combinational Circuits – Circuits for Arithmetic Operations – Application circuits for Multiplexer, De-multiplexer, Decoder and Encoder – Introduction to HDL – HDL Models of Combinational circuits (simple examples).

UNIT III - SYNCHRONOUS SEQUENTIAL LOGIC **(9)**

Sequential Circuits –Flip Flops – Design examples – State Reduction and State Assignment – Shift Registers – Counters – HDL for Sequential Logic Circuits(simple examples).

UNIT IV - ASYNCHRONOUS SEQUENTIAL LOGIC **(9)**

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

UNIT V - PROGRAMMABLE LOGIC DEVICES **(9)**

Error Detection and Correction Circuits– Programmable Logic Array –Programmable Array Logic – Sequential Programmable Devices – Application Specific Integrated Circuits

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Morris Mano M. and Michael D. Ciletti, “Digital Design”, IV Edition, Pearson Education, 2008.

REFERENCES:

1. J ohn F. Wakerly, “Digital Design Principles and Practices”, Fourth Edition, Pearson Education, 2007.
2. Charles H. Roth Jr, “Fundamentals of Logic Design”, Fifth Edition – Jaico Publishing House, Mumbai, 2003.
3. Donald D. Givone, “Digital Principles and Design”, Tata Mcgraw Hill, 2003.
4. D. P. Leach, A. P. Malvino, "Digital Principles and Applications", TMH, 2010.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x		x						
2	x	x	x	x		x						
3	x	x	x	x	x			x				x
4	x	x	x	x	x	x		x		x		x
5	x	x	x	x		x				x		x

15IT101- COMPUTATIONAL PROBLEM SOLVING AND C PROGRAMMING

(Common to CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES :

- To know the correct and efficient ways of solving problems.
- To learn the basics of C declarations, operators and expressions.
- To work on all the elementary statements (Loop, Branch) and arrays.
- To learn the manipulation of strings, functions.
- Learn on the manipulation of structures, pointers and files.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Understand the basic terminology used in computer programming.

CO2 Use different data types in a computer program.

CO3 Design programs involving decision structures, loops and functions.

CO4 Understand the concepts of arrays

CO5 Understand the function types and parameters.

UNIT-1 BASICS OF COMPUTERS & PROBLEM SOLVING **(9)**

Computer Basics - Applications and characteristics of Computer - Computer organization - Computer Software- Types of software - Software Development steps - Algorithms - Flowchart - Pseudo code

UNIT-2 INTRODUCTION TO C **(9)**

Introduction to C– Assembler, compiler and interpreter - Structure of C program – Programming Rules – Executing C program - C Declarations: Tokens – keywords – identifiers – constants - data types – variable declaration and initialization – type conversion – constant and volatile variables – operators and expressions

UNIT-3 CONTROL STRUCTURES **(9)**

Managing Input and Output operations - Decision Statements: if Statements – if-else Statement – Nested if-else – if-else-if ladder– goto statement – switch statement – nested switch case – Loop Control: for loop –while loop – do while loop – Nested Loop Statements – break and continue statement

UNIT-4 ARRAYS AND STRINGS **(9)**

Introduction to Array – Definition - Array initialization - Characteristics – One Dimensional Array – Array operations - Two dimensional arrays – Multi dimensional array – Strings and String handling functions.

UNIT-5 FUNCTIONS **(9)**

Functions: Basics - definition – Elements of User defined Functions - return statement, Function types, Parameter Passing Techniques, Function returning more values - Passing Array to Functions, Function as arguments – functions with decision and loop statements – recursion – Storage class

TOTAL (L:45) : 45 HOURS

TEXT BOOK:

1. Ashok N. Kamthane, “Programming in C”, Second Edition, Pearson Educati on, 2013.

REFERENCES:

1. Yashavant Kanetkar, “Let us C”, BPB publications, New Delhi, 3rd Ed., 2011.
2. Pradip Dey, Manas Ghosh, “Fundamentals of Computing and Programming in C”, First Edition, Oxford University Press, 2009.
3. Byron S Gottfried, “Programming with C”, Schaum’s Outlines, Second Edition, Tata McGraw-Hill, 2006.
4. R.G. Dromey, “How to Solve it by Computer”, Pearson Education, Fourth Reprint, 2007.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x					
2	x	x					x		x		x	
3	x	x	x				x		x			
4	x	x	x				x					
5	x		x						x			x

15GY111 - PHYSICS AND CHEMISTRY LABORATORY- I

(Common to All Branches)

L	T	P	C
0	0	4	2

OBJECTIVES:

- To provide the basic practical exposure to all the engineering and technological streams in the field of physics.
- To provide the basic practical exposure to all the engineering and technological streams in the field of chemistry.
- The students are able to know about the water containing impurities and some physical parameters.
- To gain the knowledge about light, sound, laser, fiber optics and magnetism.
- To develop the knowledge of conductometric titration and viscometry.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Acquire the fundamental knowledge in optics such as interference, Diffraction and Understand about the spectral instruments etc.

CO2 Gain the basic knowledge about handling the laser light and identify the basic parameters of an optical fiber.

CO3 Analyze the properties of matter with sound waves.

CO4 Apply knowledge of measurement of hardness producing ions, chloride, alkalinity, DO, conductance, EMF and pH.

CO5 Understand the impact of water quality and solve engineering problems.

LIST OF EXPERIMENTS:

PHYSICS LABORATORY-I

1. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer.
2. Determination of thickness of a thin wire – Air wedge method.
3. Determination of laser parameters - wavelength, particle size and angle of Divergence of a Laser.
4. Determination of acceptance angle and numerical aperture of an optical fiber.
5. Determination of wavelength of mercury spectrum – spectrometer grating.
6. Determination of Hysteresis loss in a ferromagnetic material.

CHEMISTRY LABORATORY- I

1. Estimation of hardness of Water by EDTA
2. Conductometric titration of strong acid Vs strong base
3. Determination of DO in water (Winkler's method)
4. Estimation of Chloride in a Water sample (Argentometric)
5. Conductometric precipitation titration using barium chloride and sodium sulphate
6. Determination of molecular weight and degree of polymerization using viscometry.

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x						x
2	x	x		x			x					x
3	x		x				x	x				x
4	x	x	x	x	x		x	x				x
5	x	x	x	x			x					x

15GY112- SOFT SKILLS – I
(Common to All Branches)

L	T	P	C
0	0	2	1

OBJECTIVES:

- To develop inter personal skills and be an affective goal oriented team player.
- To develop professionals with idealistic, practical and moral values.
- To develop communication in writing techniques.
- To re-engineer attitude and understand its influence on behaviour.
- To become self- confident individuals by mastering inter-personal skills, team management skills and leadership skills.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Analyze their strength and weakness.
CO2 Understand the importance of non-verbal communication.
CO3 Get exposure about the fundamentals of GDs and Interviews.
CO4 Communicate and present their ideas.
CO5 Know how to prepare Resume and write Report efficiently.

UNIT I **(6)**

Self-Analysis – Self Introduction – Ice breaking - Identify strength and weakness – Self- esteem and Confidence.

UNIT II **(6)**

Non-Verbal – Body Language of self and others presentation skills – Stages involved in an effective presentation – Selection of topic, content, aids – Engaging the audience - Time management.

UNIT III **(6)**

Group Discussion – Understanding the objective and skills tested in GD – Types of GD – Roles in a GD – Do's & Don'ts – Video Modules, fundamentals of placement techniques. Interview Skills – Self preparation checklist – Grooming tips (Do's& Don'ts) – Video Modules.

UNIT IV **(6)**

Out of box thinking and General behaviours.

UNIT V **(6)**

Preparing Resume and Report.

TOTAL (P:30) = 30 PERIODS

REFERENCE:

1. Andrews, Sudhir. 1988. *How to Succeed at Interviews*. 21st Reprint. Tata McGraw-Hill. New Delhi.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x		x
3									x	x		x
4									x	x		x
5									x	x		x

15EC111 - DIGITAL LABORATORY
(Common to CSE & IT Branches)

L	T	P	C
0	0	2	1

OBJECTIVE:

- To impart the concepts of digital electronics practically and train students with all the equipments which will help in improving the basic knowledge

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Know the different Logic gates used in Digital system and NAND/NOR implementation.
CO2 Simplify the Boolean equations by K-Map method.
CO3 Design/ test a Combinational logic system using gates
CO4 Design/ test a Sequential logic system using gates
CO5 Write HDL program for Digital Logic System design.

LIST OF EXPERIMENTS:

1. Verification of Boolean Theorems using basic gates.
2. Design and implementation of combinational circuits using basic gates for simple arbitrary functions.
3. Design and implementation of combinational circuits.
   - binary adder / subtractor
   - Parity generator / checker
   - Magnitude Comparator
   - Multiplexers/De-multiplexer
4. Design and implementation of sequential circuits:
   - Shift –registers
   - Synchronous and asynchronous counters
5. Coding combinational / sequential circuits using HDL.
6. Design and implementation of a simple digital system (Mini Project).

TOTAL (P:30) = 30 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x		x						x
2	x	x	x	x		x						
3	x	x	x	x		x						
4	x	x	x	x		x						
5	x	x	x	x		x						

15IT111 - C PROGRAMMING LABORATORY
(Common to CSE & IT Branches)

L	T	P	C
0	0	2	1

OBJECTIVES:

- Identify and understand the representation of numbers, alphabets and other characters in computer system.
- Identify and Understand word document, table and letter preparation.
- Identify and Understand the charts, formula editor and flowchart symbols.
- Study, analyze and understand logical structure of a computer program, and different construct to develop a program in 'C' language.
- Study, analyze and understand concepts of structure, arrays, functions and data handling through files in 'C'.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Use MS Word and MS Excel for document preparation.
CO2 Draw flowchart using open source tool.
CO3 Develop program using basic C constructs.
CO4 Write program using arrays and functions.
CO5 Create program using pointer, structure and files.

Word Processing

1. Document creation, Text manipulation with Scientific notations
2. Table creation, Table formatting and Conversion
3. Mail merge and Letter preparation

Spread Sheet

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

RAPTOR –Tool

6. Drawing - flow Chart

C-Programming

7. Program Using Operators, Expressions and IO formatting
8. Program Using Decision Making
9. Program Using Looping
10. Program Using Arrays
11. Program Using Strings
12. Program Using Functions
13. Program Using Recursion

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

Hardware

- LAN System with 33 nodes (OR) Standalone PCs – 33 Nos.
- Printers – 3 Nos.

Software

- OS – Windows / UNIX Clone
- Application Package – Office suite
- RAPTOR –Tool
- Compiler – C

TOTAL (P:30) = 30 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and Pos												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x										
2	x	x	x		x					x		
3	x	x			x					x	x	
4	x	x					x				x	x
5	x	x	x	x			x				x	x

15EY201 - PROFESSIONAL ENGLISH
(Common to All Branches)

L	T	P	C
1	0	2	2

OBJECTIVES:

- To convert the conceptual understanding of communication into everyday practice.
- To sensitise students to the nuance of the basic listening skills and to explain effectively for active reading.
- To train students to summon words, phrases relevant to the immediate communication tasks .
- To prepare students acquire the ability to write effectively in English in real life situations and work related situations.
- To make students reflect and improve their use of body language – posture, gesture, facial expression, tone.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Develop communicative proficiency by articulating words and sentences undoubtedly.
CO2 Interpret different accents and modulations through active listening and effective reading.
CO3 Prepare, organize, and deliver an engaging oral presentation and articulate their own ideas in relation to other voices and ideas.
CO4 Write effectively for a variety of professional and social settings.
CO5 Understood the significance of soft skills in the working environment.

UNIT I: GRAMMAR **(9)**

Degrees of Comparison - Transformation of Sentences – Correction of errors – Reported Speech – Word Formation – Proximity of Concord - Connectives - Phrasal Verbs.

UNIT II: VOCABULARY **(9)**

Building Vocabulary using Thesaurus – Cloze Test –Idioms and Phrases - Analogy- Collocation – Modifiers - Redundancy.

UNIT-III: LISTENING AND SPEAKING **(9)**

Introduction to articulation skills (Speech Pattern) - Activity based Listening and Speaking Practice (Listening to News, practicing Short Speeches and Debate).

UNIT IV: READING **(9)**

Reading Practice using General and Technical Articles from Newspapers and Science magazines – Reading short notices, Advertisements and passages –Levels of Reading Comprehension.

UNIT V: WRITING **(9)**

Interpretation of pictures and cartoons – Slogan writing – Dialogue writing – Theme building exercises – Paragraph Completion – Instructions –Exercise on accuracy, brevity and correctness.

TOTAL (L:15+P:30) =45 PERIODS

TEXT/ REFERENCES BOOKS:

1. Rizvi, Ashraf M, “Effective Technical Communication”, Tata McGRaw Hill Publishing Company Limited, New Delhi, 2006.
2. Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006.
3. Hewings. M, “Advanced English Grammar”, Cambridge University Press, Chennai, 2000.
4. Raman M & Sangeetha Sharma, “Technical Communication”, Oxford University Press, USA, 2005.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x	x	x
3									x	x		x
4									x	x		x
5									x	x	x	x

15MY202 -CALCULUS AND LAPLACE TRANSFORM
(Common to CSE & IT Branches)

L	T	P	C
3	2	0	4

OBJECTIVES:

- Apply knowledge of Mathematics in Engineering.
- Communicate problem solutions using correct Mathematical terminology.
- Apply rigorous and analytic approach to analyse and solve differential equations.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Have learnt the methods of double and triple integration, which are needed in their studies in other areas and gained confidence to handle integrals of higher orders.

CO2 Have studied the basics of vector calculus comprising of gradient, divergence and curl and line, surface and volume integrals and the classical theorems involving them, which would be encountered by them in their engineering subjects in the same or higher semesters.

CO3 Have a good grasp 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.

CO4 Have grasped the basis of complex integration and the concept of contour integration which is an important tool for evaluation of certain integrals encountered in practice.

CO5 Have a sound knowledge of Laplace transform and its properties and sufficient exposure to solution of certain linear differential equations using the Laplace transform techniques which have applications in other subjects of the current and higher semesters.

UNIT I: MULTIPLE INTEGRALS **(9)**

Double integration in Cartesian Co-ordinates-Change of order of integration-Area as double integral- Triple integration in Cartesian Co-ordinates-Volume as triple integrals.

UNIT II: VECTOR CALCULUS **(9)**

Gradient and Directional derivative -Divergence and Curl – Irrotational and solenoidal vector fields – Line integral over a plane curve – Surface integral and volume integral - Green's ,Gauss divergence, Stokes Theorem (Statement only)-Verification and Evaluation.

UNITIII: ANALYTIC FUNCTIONS **(9)**

Functions of a complex variable - Analytic functions – Necessary and sufficient conditions for analyticity (Statement only) – Properties – Harmonic conjugate – Construction of analytic function – Conformal mapping – Mapping by functions: w = z + c, cz, 1/z, and Bilinear transformation.

UNIT IV: COMPLEX INTEGRATION **(9)**

Cauchy's integral theorem and integral formula – Taylor's and Laurent's series - Singularities - Residues – Residue theorem (Statement only) - Application of Residue theorem to evaluate real integrals – Evaluation of contour integrals of the type (i) Around unit circle $\int_0^{2\pi} f(\cos\vartheta, \sin\theta)d\theta$ (ii) $\int_{-\infty}^{\infty} \frac{P(x)}{Q(x)} dx$ with no pole on real axis.

UNIT V: LAPLACE TRANSFORM **(9)**

Definition-To discuss about the Laplace Transform of Standard functions: e^{at}, $\sin at$, $\sinh at$, t^n, $f'(t)$, $f''(t)$ -First Shifting Theorem (Statement only) - Initial and Final value Theorems. Inverse Laplace transforms - Convolution theorem (Statement only) – Applications of Laplace transform for differential equations of 2nd order with constant co-efficients.

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

TEXT BOOKS:

1. Dr.B.S.Grewal, “Higher Engineering Mathematics”, 42nd Edition, Khanna publications, 2012.
2. Erwin Kreyszig, “Advanced Engineering Mathematics”, 9th Edition, John Wiley & sons, 2013.
3. Veerarajan.T, “Engineering Mathematics for first year”, Third Edition,Tata McGraw Hill,2011.

REFERENCES:

1. N.P.Bali, Manish Goyal, “A text book of Engineering Mathematics: Sem-II”, 5th Edition, Laxmi Publications.2011.
2. P.Kandasamy, K.Thilagavathy,K.Gunavathy,“Engineering Mathematics for first Year”, 9th Rv. Ed., S.Chand & Co Ltd, 2013.
3. Glyn James, “Advanced Engineering Mathematics”, 7thEdition, Wiley India, (2007).

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x								x			
2	x								x			
3	x	x	x							x	x	
4	x								x			
5	x											

15PY202 - APPLIED PHYSICS
(Common to CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide the basic ideas in electrical conduction, conductors, semiconductors and nano technology.
- To understand the fundamental concepts on solid state physics.
- To provide the basic knowledge in luminescence and optoelectronic devices.
- To understand the basic knowledge in magnetism and data storage devices.
- To update the recent development about modern engineering materials.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Acquire knowledge about conductors, semiconductors and superconductors.
CO2 Distinguish between conductors, semiconductors and super conductors.
CO3 Understand the magnetism and its applications.
CO4 Design various optoelectronic devices
CO5 Aware of recent trends in nanotechnology

UNIT I - CONDUCTING MATERIALS **(9)**

Electron theories of conductivity - postulates of classical free electron theory- derivation of electrical conductivity of metals (Drude- Lorentz theory) - merits and demerits. Derivation of thermal conductivity – Wiedeman-Franz law-verification. Fermi energy - Importance of fermi energy - Fermi-Dirac distribution function and its variation with temperature - density of energy states- calculation of density of electrons.

UNIT II - SEMICONDUCTING MATERIALS & SUPERCONDUCTING MATERIALS **(9)**

SEMICONDUCTORS: Elemental and compound semiconductors - Intrinsic semiconductor – carrier concentration derivation – Variation of Fermi level with temperature – electrical conductivity – band gap determination – Extrinsic semiconductors (qualitative) – variation of Fermi level with temperature and impurity concentration – Hall effect – Determination of Hall coefficient – Applications.
SUPERCONDUCTIVITY: Properties - Types of superconductors – BCS theory of superconductivity – Applications of superconductors – SQUID, cryotron, magnetic levitation.

UNIT III - MAGNETIC MATERIALS **(9)**

Origin of magnetic moment – Bohr magneton – Types of magnetic materials – Domain theory – Hysteresis – soft and hard magnetic materials. Ferrites – applications – magnetic recording and readout – tapes, floppy and magnetic disc drives.

UNIT IV - OPTICAL DEVICES **(9)**

Optical properties of semiconductor- Excitons-traps-colour centre- Types of colour centres- luminescence-fluorescence and phosphorescence-liquid crystal displays-dynamic scattering display-twisted nematic crystal display - Light emitting diodes- solar cell.

UNIT V - MODERN ENGINEERING MATERIALS &NANOTECHNOLOGY **(9)**

Metallic glasses: preparation, properties and applications. Shape Memory Alloys (SMA): Characteristics, properties of NiTi alloy, applications, advantages and disadvantages of SMA. Nanomaterials: synthesis –plasma arcing – chemical vapour deposition – sol-gel – electro deposition – ball milling - properties of nanoparticles and applications. Carbon nanotubes: fabrication – arc method – pulsed laser deposition –structure – properties and applications.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. V.Rajendran, "Engineering Physics", Tata McGraw-Hill. New Delhi.2011.
2. P.K.Palanisami, "Physics for Engineers-Volume I", Scitech publications (India) Pvt.Ltd, Chennai, 2002.
3. M.N.Avadhanulu, P.G.Kshirsagar "A Text book of Engineering Physics", S.Chand, 2011.

REFERENCES:

1. Jacob Millman, Charistos C Halkilas, Satyabrata Jit "Electronic Devices & Circuits", Tata McGraw Hill Education Private Limited, 2010, Third Edition.
2. Ben G.Streetman, Sanjay Banerjee, "Solid State Electronic Devices", Pearson Education, 2006, Fifth Edition.
3. G.Senthil Kumar, N.Iyandurai, "Physics-II", VRB Publishers, 2005-2006, Revised Edition.
4. S.O. Pillai, "Solid State Physics", New Age International Publications, New Delhi, 2010.

Mapping of Course Outcome and Programme Outcome

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x						x
2	x	x		x			x					x
3	x	-	x				x	x				x
4	x	x	x	x	x		x	x				x
5	x	x	x	x			x					x

15CY201 - ENVIRONMENTAL SCIENCE AND ENGINEERING

(Common for All Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the constitutes of the environment.
- The students should be conversant with valuable resources
- To know about the role of a human being in maintaining a clean environment.
- To maintain ecological balance and preserve bio-diversity.
- To get knowledge about the conservation of environment for the future generation.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Design a system, component, or process to meet desired needs

CO2 Identify, formulate, and solve environmental engineering problems

CO3 Understand the professional and ethical responsibility as related to the practice of environmental engineering and the impact of engineering solutions in a global context

CO4 Use the techniques, skills, and modern engineering tools necessary for environmental engineering practice.

CO5 Acquire the knowledge of information technology in environmental science.

UNIT- I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES (9)

Environment: Scope – importance - need for public awareness. Forest resources: Use-over exploitation-deforestation. Water resources: Use-over utilization of surface and ground water - conflicts over water. Mineral resources: Use-exploitation-environmental effects of extracting and using mineral resources. Food resources: World food problems changes caused by agriculture. Effects of modern agriculture - fertilizer- pesticide problems. Energy resources: Renewable energy sources - solar energy - wind energy. Land resources: land degradation - soil erosion. Role of an individual in conservation of natural resources.

UNIT- II ECOSYSTEMS AND BIODIVERSITY (9)

Concepts of an ecosystem: Structure and function of an ecosystem - Producers, consumers and decomposers. Food chains- food webs. Types of ecosystem: Structure and functions of forest ecosystem and river ecosystem. Biodiversity: Value of biodiversity: consumptive use-productive use - social values - ethical values - aesthetic values. Hotspots of biodiversity -Threats to biodiversity: Habitat loss - poaching of wildlife and man wildlife conflicts- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT - III ENVIRONMENTAL POLLUTION (9)

Pollution: Causes, effects and control measures of Air pollution, Water pollution, Soil pollution and Noise pollution. Solid waste management: Causes - effects -control measures of urban and industrial wastes. Role of an individual in prevention of pollution - Disaster managements: Floods - cyclone- landslides.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT (9)

Water conservation - rain water harvesting. Climate change - global warming - acid rain - ozone layer depletion. Environment protection act: Air (Prevention and control of pollution) Act - Water (prevention and control of pollution) Act - Wildlife protection Act - Forest conservation Act.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT (9)

Population growth - variation among nations - Population explosion - Family welfare programme - Human rights - HIV/AIDS - women and child welfare - Role of information technology in environment and human health.

TOTAL (L: 45) = 45 PERIODS

TEXTBOOKS:

1. Anubha Kaushik and C.P. Kaushik, Environmental Science and Engineering, New Age International Publishers, New Delhi (2006)
2. "Elements of Environmental Science and Engineering", P.Meenakshmi, Prentice-Hall of India, New Delhi (2005).
3. Dr.A.Ravikrishnan,Environmental Science and Engineering.,Sri Krishna Hitech Publishing co. Pvt .Ltd., Chennai,13 th Edition (2012).

REFERENCES:

1. Masters, Gilbert M, "Introduction to Environmental Engineering and Science", Second Edition, Pearson Education, New Delhi (2004).
2. Santosh Kumar Garg, Rajeshwari garg, smf Ranjni Garg "Ecological and Environmental Studies" Khanna Publishers, Nai Sarak, Delhi (2006).
3. Miller T.G. Jr., "Environmental Science", Tenth Edition, Wadsworth Publishing Co. (2004).

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x		x					x		x
2	x		x	x	x							x
3		x	x	x			x					x
4	x			x							x	x
5	x				x	x	x		x	x		x

15IT201 - ADVANCED C AND DATA STRUCTURES
(*Common to CSE & IT branches)*

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn on the manipulation of pointers, structure, union and files.
- To understand the different methods of organizing large amounts of data.
- To efficiently abstract data types for linear and non-linear data structures.
- To efficiently implement solutions for specific problems.
- Critically analyse the various algorithms.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Understand the dynamics of memory by the use of pointers.

CO2 Exemplify and implement how abstract data types such as stack, queue and linked list can be implemented to manage the memory using static and dynamic allocations.

CO3 Understand and distinguish the conceptual and applicative differences in trees.

CO4 Design various routing algorithms using appropriate data structures.

CO5 Understand complex data structures like graph and its traversal.

UNIT-I: ADVANCED C **(9)**

Pointer concepts-Pointers & Arrays, Structure concepts - Defining, Declaring, Accessing Member Variables, Structure within Structure - Union **-** File Management in C- Dynamic Memory Allocation.

UNIT-II: LINEAR DATA STRUCTURES - LIST **(9)**

Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation – singly linked lists- circularly linked lists- doubly-linked lists – applications of lists – Polynomial Manipulation.

UNIT-III: LINEAR DATA STRUCTURES – STACK, QUEUE **(9)**

Stack ADT – Evaluating arithmetic expressions- other applications- Queue ADT – circular queue implementation – Double ended Queues – applications of queues.

UNIT-IV: NON LINEAR DATA STRUCTURES - TREE **(9)**

Definitions - Binary Trees - The Search tree ADT – Binary Search Trees – AVL Tree – Tree Traversals – Priority Queues (Heap) – Model – simple implementations – Binary Heap.

UNIT-V: GRAPHS **(9)**

Definitions – Representation of graph – Graph traversal: Depth first search –Breadth first search – Topological Sort - Shortest Path Algorithm: Unweighted Shortest paths – Dijkstra's Algorithm- Minimum Spanning Tree: Prim's Algorithm – Kruskal's Algorithm.

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. Ashok.N.Kamthane, “Programming in C”, Pearson Education (India), 2nd Ed., 2013. (Unit I).
2. M. A. Weiss, “Data Structures and Algorithm Analysis in C”, 2nd ed., Pearson education Asia, 2002(Unit II to Unit V).

REFERENCES:

1. F Richard, Gilberg and Behrouz A. Forouzan, “Data Structures – A Pseudocode Approach with C”, Thomson Brooks / COLE, 1998.
2. Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, “Data Structures using C”, Pearson Education Asia, 2004.
3. Yashavant Kanetkar, “Let us C”, BPB publications, New Delhi, 3rd Ed., 2011.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x					
2	x	x					x		x		x	
3	x	x	x				x		x			
4	x	x	x				x					
5	x			x							x	x

15MEC01- ENGINEERING GRAPHICS

(Common to All Branches except MECH.)

L	T	P	C
2	0	2	3

OBJECTIVES:

- To learn to take data and transform it into graphic drawings.
- To learn basic engineering drawing and standards related to technical drawing.
- To learn about 2D and 3D drawings.
- To understand and practice the drawings.
- To Familiar with specifications create drawings and layouts of a product.

COURSE OUTCOMES:

CO1 Understand the concepts of Conics.
CO2 Create the projection of point, straight line and plane
CO3 Draw the drawing of various solids.
CO4 Familiar with section of solids in different cutting planes
CO5 Create drawings and layouts of a product in 3D.

Concepts and Conventions:

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 : GEOMETRICAL CONSTRUCTIONS AND PLANE CURVES (12)

Geometrical constructions: Dividing a given straight line into any number of equal parts, bisecting a given angle, drawing a regular polygon given one side, special methods of constructing a pentagon and a hexagon Curves used in engineering practices: 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.

UNIT II : PROJECTION OF POINTS, LINES AND PLANE SURFACES (12)

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 III : PROJECTION OF SOLIDS (12)

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV : SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES (12)

Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other - Obtaining true shape of section. Development of lateral surfaces of simple and truncated solids - Prisms, pyramids, cylinders and cones- Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V : ISOMETRIC, PERSPECTIVE PROJECTIONS & BUILDING DRAWING (12)

Principles of isometric projection - isometric scale - isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones. Perspective projection of prisms, pyramids and cylinders by visual ray method.

Plan, elevation and section of single storied residential building with flat RCC roof and brick masonry walls having not more than 2 rooms. Free hand sketching in isometric projection.

TOTAL (L:30+P:30) : 60 PERIODS

TEXT BOOK:

1. Venugopal.K, PrabhuRaja.V, “Engineering Drawing+AutoCAD”, 5th ed., Reprint, New Age International, 2011.

REFERENCES:

1. Basant Agarwal and Agarwal C.M., “Engineering Drawing”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
2. Natrajan.K.V, “A text book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai, 2006.
3. Kumar.M.S, “Engineering Graphics”, D.D. Publications, 2007.
4. Bhatt.N.D, “Engineering Drawing” Charotar Publishing House, 2011.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x	x		x	x	x	x		x
2	x	x		x	x		x	x	x	x		x
3	x	x		x	x		x	x	x	x		x
4	x	x		x	x		x	x	x	x		x
5	x	x		x	x		x	x	x	x		x

15GY211 - PHYSICS AND CHEMISTRY LABORATORY- II

(Common to All Branches)

L	T	P	C
0	0	4	2

OBJECTIVES:

- To provide the basic practical exposure to all the engineering and technological streams in the field of physics. .
- To provide the basic practical exposure to all the engineering and technological streams in the field of chemistry.
- The students are able to know about the water containing impurities and some physical parameters.
- To gain the knowledge about properties of matter, semiconductors and solar cells
- To develop the knowledge of spectrophotometry.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Acquire the practical knowledge in various moduli.

CO2 Gain the practical knowledge about band gap of a semiconductor and optoelectronic devices and Understand about the spectral instruments.

CO3 Analyze the properties of matter and determine the thermal conductivity of a material.

CO4 Apply knowledge of measurement of conductance, hardness producing ions, alkalinity, conductance, EMF and pH

CO5 Understand the impact of water quality and to solve engineering problems

LIST OF EXPERIMENTS:

PHYSICS LABORATORY- II

1. Determination of Young's modulus of the material – non uniform bending.
2. Determination of Band Gap of a semiconductor material.
3. Determination of viscosity of liquid – Poiseuille's method.
4. Spectrometer dispersive power of a prism.
5. Determination of Young's modulus of the material – uniform bending.
6. Torsional pendulum – Determination of rigidity modulus.
7. Solar cell – VI characteristics
8. V-I characteristics of PN junction diode.
9. Determination of thermal conductivity of a bad conductor – Lee's Disc method.

CHEMISTRY LABORATORY- II

1. Estimation of alkalinity of Water sample
2. Estimation of Copper in brass by EDTA
3. Conductometric titration of mixture of acids.
4. Estimation of iron by potentiometry.
5. Estimation of hydrochloric acid by pH metry.
6. Estimation of water of crystallization of copper sulphate.
7. Estimation of iron by spectrophotometer.

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TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x				x		x	x	x	x
2	x	x		x		x					x	x
3	x	x		x	x						x	x
4												
5										x		

15GY212 - SOFT SKILLS – II
(Common to All Branches)

L	T	P	C
0	0	2	1

OBJECTIVES:

- To re-engineer attitude and understand its influence on behaviour.
- To recognize stress symptoms & develop stress deflecting strategies.
- To improve time management, organizational skills and goal setting.
- To develop leadership skills to improve teamwork, creativity, efficiency & productivity.
- To become self- confident individuals by mastering inter-personal skills, team management skills and leadership skills**.**

COURSE OUTCOME:

On completion of this course the students will be able to

CO1 Narrate stories by their own.
CO2 Develop their leadership qualities for the betterment of the team.
CO3 Acquire strategic knowledge about how to manage time.
CO4 Overcome stress making factors in society.
CO5 Know how to prepare Resume and write Report efficiently.

UNIT I **(6)**

Effective presentation strategies – Story telling – Visual communication.

UNIT II **(6)**

Team work – Importance of team work – Leadership skills - attributes of a successful team – barriers involved- dealing with people- Group decision making.

UNIT III **(6)**

Life and Managerial skills – Effective ways of dealing with people – Emotional intelligence- Types of conflicts (Inter and Intra group conflicts).

UNIT IV **(6)**

Time Management – Tips and strategies- Time wasters – Procrastination – Advantages of time management.

UNIT V **(6)**

Stress management – Management of various forms of fear (examination fear, stage fear and public speaking fear).

TOTAL (P:30) = 30 PERIODS

TEXT BOOK :

1. Swaminathan. V.D &Kaliappan.K.V(2001), “Psychology for Effective Living”, Chennai, The Madras Psychology Society.

REFERENCES:

1. Robbins, S.B.(2005). Organizational Behavior. New Delhi: Prentice Hall of India.
2. Smith, B (2004). Body Language. Delhi: Rohan Book Company.
3. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x		x
3									x	x		x
4									x	x		x
5									x	x		x

15IT211 DATA STRUCTURES LABORATORY

(Common to CSE & IT branches)

L	T	P	C
0	0	2	1

OBJECTIVES:

- To learn the manipulation of Structures, Unions and Pointers.
- To learn about linear and non-linear data structure.
- To efficiently abstract data types for linear and non-linear data structures.
- To efficiently implement solutions for specific problems.
- Critically analyse the various algorithms.

COURSE OUTCOMES:

On completion of this course the students will be able to:

CO1 Implement dynamic memory allocation for structures and unions.

CO2 Device linear Data structure like list, stack and queue

CO3 Understand about evaluation of expressions.

CO4 Build and implement non-linear data structure, tree.

CO5 Design and implement non-linear data structure, graph and its traversal.

LIST OF PROGRAMS:

1. Program Using Structures and Unions
2. Program Using Pointers.
3. Implementation of singly linked list.
4. Implementation of Doubly linked list.
5. Implementation of Polynomial addition using List ADT.
6. Array implementation of Stack and Queue ADT.
7. Linked list implementation Stack and Queue ADT.
8. Implementation of stack applications:
    a. Program for Balanced Parenthesis.
    b. Program for Evaluating Postfix Expressions.
9. Implementation of Binary tree traversals.
10. Search Tree ADT - Binary Search Tree.
11. Implementation of Breadth First Search Techniques.
12. Implementation of Depth First Search Techniques.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x					x
2	x	x					x		x		x	x
3	x	x	x				x		x			x
4	x	x	x				x					
5	x		x				x					x

15GYC11 ENGINEERING PRACTICES LABORATORY

(Common to All Branches)

L	T	P	C
0	0	4	2

OBJECTIVES:

- To provide hands on training on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.
- To understand the basic working principle of electric components
- To understand and operate multimeter for current, voltage and resistance measurements
- Have and technical skills required to remain productive in the field of Electrical Engineering

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1 Understand various civil engineering practices like plumbing, carpentry and relevant tools

CO2 Understand various manufacturing processes and get familiarity with the instruments such as CRO, Function generator, single and dual power supply, multi-meter, bread board, IC's, and components such as diodes, transistors, resistors, capacitors, inductors, etc.

CO3 Get familiarity with the testing of capacitors, diodes, transistors with Analog multimeter or Digital multimeter.

CO4 Understand the principles of electrical circuits and electronics, and analysis, synthesis, and experimental techniques for both analog and digital electronic circuits.

CO5 Do residential house wiring and Measure energy and resistance to earth of electrical equipment.

GROUP-A (MECHANICAL AND CIVIL ENGINEERING)

I - CIVIL ENGINEERING PRACTICE **(15)**

Buildings:

a. Study of plumbing and carpentry components of residential and industrial buildings, Safety aspects.

Plumbing Works:

a. Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
b. Study of pipe connections requirements for pumps and turbines.
c. Preparation of plumbing line sketches for water supply and sewage works.
d. Hands-on-exercise:

   Basic pipe connections –Mixed pipe material connection –Pipe connections with different joining components.
e. Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:

a. Study of the joints in roofs, doors, windows and furniture.
b. Hands-on-exercise: Planning, Tee joints.

II - MECHANICAL ENGINEERING PRACTICE **(15)**

Welding:

a. Preparation of edges for welding and study of welding symbols.
b. Arc welding- butt joints, lap joints and tee joints.
c. Gas welding
d. Study of standard size of bars, rods, sections, sheet metals.
e. Study of work piece types and parameters of welding such as welding current, air gap, filler metal.

Basic Machining:

a. Facing & Plain turning
b. Drilling Practice
c. Study of different types of screw drivers, screws, bolts and nuts.

Sheet Metal Work:

a. Model making using bending and forming - Trays, cone.
b. Study of thickness gauges, wire gauges.

GROUP - B (ELECTRICAL AND ELECTRONICS)

ELECTRICAL ENGINEERING PRACTICE **(15)**

a. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
b. Fluorescent lamp wiring.
c. Stair case wiring
d. Measurement of electrical quantities –voltage, current, power & power factor in RLC circuit.
e. Measurement of energy using single phase energy meter.
f. Measurement of resistance to earth of electrical equipment.

ELECTRONICS ENGINEERING PRACTICE **(15)**

a. Study of Electronic components and equipment –Resistor (Colour coding), Inductor, Capacitor.
b. Measurement of AC signal parameter (peak-peak, RMS period, frequency) using CRO.
c. Study of logic gates AND, OR, XOR and NOT.
d. Study of Clock Signal.
e. Soldering practice -Components Devices and Circuits –Using general purpose PCB.
f. Study of HWR and FWR.
g. Study of Telephone, FM Radio and Cell Phone.

TOTAL (P:60) : 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x				x	x		x				
2	x	x	x		x	x		x				
3	x				x	x		x				
4	x				x	x		x				
5	x				x	x		x				

15MY302 - FOURIER ANALYSIS, INTEGRAL TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

(Common to CSE & IT Branches)	L	T	P	C
	3	2	0	4

OBJECTIVE:

- The course aims to impact analytical skills to the students in the areas of boundary value problems and transforms techniques.
- The course objective is to develop the skills of the students in the areas of Transforms and Partial Differtial Equations.
- This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory.
- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems?
- To acquaint the student with Fourier transform techniques used in wide variety of situations. To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems.

COURSE OUTCOMES:

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

CO1	Determine the behavior of the Fourier series at points of discontinuity using Dirichlet‟s boundary condition,use half range sine and cosine series, Parseval‟s Identity and perform harmonic Analysis of a discrete function.
CO2	Form and solve first & higher order partial differential equation, Lagrange‟s equations.
CO3	Solve one dimensional wave and heat equation separation of variables method and Fourier series.
CO4	Solve problems using Fourier integral theorem and convolution theorem.
CO5	Develop Z-transform techniques for discrete time systems.

(9)

UNIT - I FOURIER SERIES

Dirichlet's conditions – Fourier series – Odd and even functions – Half range sine series – Half range cosine series - Parseval's identity – Harmonic Analysis.

UNIT - II PARTIAL DIFFERENTIAL EQUATIONS **(9)**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solution of standard types: f(p,q)=0,Clairut's form, f(x,p,q)=0, f(y,p,q)=0, f(z,p,q)=0,Separable Equation – Lagrange's linear equation – Linear partial differential equations of second and higher order with constant coefficients

(R.H.S = $0, e^{ax+by}, \cos(ax+by), \sin(ax+by), x^r y^s$).

UNIT- III APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS **(9)**

Classification of second order quasi linear partial differential equations – Solutions of one dimensional wave equation (Zero and Non-Zero Boundary Conditions) – One dimensional heat equation (Reduced to Zero and Non-Zero temperature) – Steady state solution of two-dimensional heat equation (Finite and infinite Plate).

UNIT - IV FOURIER TRANSFORM **(9)**

Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem - Parseval's identity-Finite Fourier Transform.

(9)

UNIT- V Z -TRANSFORM AND DIFFERENCE EQUATIONS

Z transform: Standard Results – First Shifting theorem, Second Shifting theorem(Excluding Proof) – Initial and Final Value Theorem(Excluding Proof) – Inverse Z transform (Partial fraction method and Residue method) – Convolution theorem -Formation of difference equations – Solution of difference equations using Z transforms. .

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

TEXT BOOKS:

1. Grewal, B.S. "Higher Engineering Mathematics", 42nd ed., Khanna publishers, New Delhi, 2012.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics; Volume III", S. Chand & Co Ltd., 2006.

REFERENCES:

1. Veerarajan,T. "Engineering mathematics (for III Semester)", 3rd ed., Tata Mc Graw Hill, New Delhi, 2005.
2. Goyal. Manish and Bali, N.P, "A Textbook of Engineering mathematics", 6th ed., Laxmi Publication (P) Ltd. New Delhi, 2012.
3. Kreyszig, Erwin. "Advanced Engineering Mathematics", 9th ed., Wiley Publications, New Delhi, 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x								
2					x	x	x	x		x		
3										x	x	x
4		x						x				
5			x	x							x	

15IT301 - OPERATING SYSTEM PRINCIPLES

L	T	P	C
3	0	0	3

OBJECTIVES :

- Study the basic concepts and functions of operating systems.
- Understand the structure and functions of OS.
- Learn about Processes, Threads and Scheduling algorithms.
- Understand the principles of concurrency and Deadlocks.
- Learn various memory management schemes.

COURSE OUTCOMES:

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

CO1	Design various Scheduling algorithms.
CO2	Apply the principles of concurrency.
CO3	Design deadlock, prevention and avoidance algorithms.
CO4	Compare and contrast various memory management schemes.
CO5	Design and Implement a prototype file systems.

UNIT-1 OPERATING SYSTEMS OVERVIEW (9)

Computer System Overview-Basic Elements, Instruction Execution, Operating system overview-objectives and functions, Evolution of Operating System. - Computer System Organization- Operating System Structure-System Calls, System Programs, Virtual machine, OS Generation and System Boot.

UNIT -2 PROCESS MANAGEMENT (9)

Processes: Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication; Threads- Overview: Multithreading Models- Process Synchronization: Critical Section Problem, Mutex Locks, Semaphores, Monitors-CPU Scheduling - Deadlocks.

UNIT-3 STORAGE MANAGEMENT (9)

Main Memory-Contiguous Memory Allocation-Segmentation-Paging; Virtual Memory: Demand Paging, Page Replacement, Allocation, Thrashing, Allocating Kernel Memory, OS Examples.

UNIT-4 MASS STORAGE STRUCTURES (9)

Mass Storage Structure- Overview-Disk Structure-Disk Attachment-Disk Scheduling- Disk Management- Swap-Space Management - RAID Structure – Stable storage Implementation.

UNIT-5 I/O & FILE SYSTEM MANAGEMENT (9)

I/O Systems-File- System Interface : File Concepts, Directory Structures, Sharing and Protection-File System Implementation: File System Structure, Allocation Methods, Free Space Management; Basic Concepts of Linux System- Basics of Virtualization- Windows XP fundamentals.

TOTAL (L:45) : 45 PERIODS

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 9th Edition, John Wiley and Sons Inc., 2012.

REFERENCES:

1. William Stallings, “Operating Systems – Internals and Design Principles”, 7th Edition, Prentice Hall, 2011.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Addison Wesley, 2001.
3. Charles Crowley, “Operating Systems: A Design-Oriented Approach”, Tata McGraw Hill Education”, 1996.
4. D M Dhamdhere, “Operating Systems: A Concept-Based Approach”, Second Edition, Tata McGraw-Hill Education, 2007.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x	x			x				x	x
2					x							
3				x						x	x	
4		x		x								
5					x		x				x	

15IT302 - OBJECT ORIENTED PROGRAMMING USING C++

L	T	P	C
3	0	0	3

OBJECTIVES :

- To know the salient features of Object Oriented Programming.
- To learn the basics of C++ data types, access modifiers, classes and objects.
- To work on identifying the relationship between classes.
- To learn on reading and writing contents to file.

COURSE OUTCOMES:

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

CO1	Relate real world object into entity.
CO2	Create reusable system components.
CO3	Predict runtime error using exception handling technology.
CO4	Examine program scenario in different situation.
CO5	Employ storing of real time entities using file handling.

UNIT-1 INTRODUCTION (9)

Introduction to C++ - Object oriented programming concepts- C++ fundamentals – Data types – Access modifier – Classes & Objects - function and data members - default arguments – friend function- inline function - static members - namespaces.

UNIT -2 CONSTRUCTORS AND STATIC POLYMORPHISM (9)

Constructors - Default constructor- Parameterized Constructors- Constructors with dynamic allocation-Copy Constructors-Destructors- Static polymorphism – function overloading –operator overloading-Unary and binary operator overloading – overloading assignment operator - overloading through friend functions.

UNIT-3 TEMPLATES AND EXCEPTION HANDLING (9)

Generic programming – Templates – Class template – Function template – Templates with multiple generic data type- Exception handling – try-catch-throw paradigm –exception specification.

UNIT-4 INHERITANCE AND RUNTIME POLYMORPHISM (9)

Inheritance – public, private, and protected derivations – classification-multiple inheritance – virtual base class - Runtime polymorphism – virtual functions – virtual destructor.

UNIT-5 I/O STREAMS AND FILE HANDLING (9)

Unformatted and formatted I/O – I/O manipulators - files handling - Binary & ASCII files-sequential and random access- standard template library.

TOTAL(L:45): 45 PERIODS

TEXT BOOK:

1. B. Trivedi, “Programming with ANSI C++”, Second Edition, Oxford University Press, 2013

REFERENCES:

1. K.R.Venugopal, Rajkumar, T.Ravishankar, ”Mastering C++,” 4th edition, TataMcGraw Hill,2008.
2. Ira Pohl, “Object Oriented Programming using C++”, Pearson Education, Second Edition Reprint 2004.
3. Herbert Schildet – C++ The complete Reference – Tata McGraw Hill – Third Edition – 2001.
4. S. B. Lippman, Josee Lajoie, Barbara E. Moo, “C++ Primer”, Fourth Edition, Pearson Education, 2005.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x	x			x				x	x
2		x			x		x					
3		x	x	x								
4		x		x								
5					x		x				x	

15IT303 - ANALYSIS OF ALGORITHMS

L	T	P	C
3	0	0	3

OBJECTIVE :

- To learn the development of efficient algorithms for computational tasks and reasoning about the correctness of the algorithm.

COURSE OUTCOMES:

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

CO1	Present fundamental concepts and techniques for algorithm design.
CO2	Provide necessary background for writing algorithms in a formal way.
CO3	Analyze the time and space complexity of algorithms.
CO4	Critically analyze the different algorithm design techniques for a given problem.
CO5	Design algorithms for various computing problems.

UNIT-1 BASIC CONCEPTS OF ALGORITHMS (9)

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT -2 MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS (9)

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT-3 BRUTE FORCE AND DECREASE- AND –CONQUER (9)

Brute Force – Selection Sort – Sequential Search–Closest pair and convex –hull problems by brute force - Decrease and Conquer – Insertion Sort – Decrease-by-a-Constant-Factor Algorithms-Variable-Size-Decrease Algorithms.

UNIT-4 DIVIDE-AND -CONQUER AND TRANSFORM CONQUER (9)

Divide and conquer – Merge sort – Quick Sort – Binary Search – Transform and conquer – Presorting - Heaps and Heap Sort- Horner's Rule.

UNIT-5 DYNAMIC PROGRAMMING AND BACKTRACKING (9)

Dynamic Programming – 0/1 Knapsack Problem - Floyd's Algorithm - Backtracking – N Queen's problem – Subset problem.

TOTAL(L:45): 45 PERIODS

TEXT BOOK:

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 3rd edition, 2012.

REFERENCES:

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms", Pearson Education, Reprint 2006.
3. Donald E. Knuth, "The Art of Computer Programming", Volumes 1& 3Pearson Education, 2009.
   Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008.
4. http://nptel.ac.in/

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x			x					x
2					x							
3				x						x		
4		x			x							
5				x			x					

15IT304 - FUNDAMENTALS OF SOFTWARE ENGINEERING

L	T	P	C
3	0	0	3

OBJECTIVES :

- To teach the concepts of process, product and project
- To elucidate the knowledge of requirement analysis
- To provide the knowledge of software design and testing
- To introduce the project management techniques

COURSE OUTCOMES:

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

CO1	Explain the system fundamentals, process models and development life cycle .
CO2	Good knowledge of design, and analysis and patterns.
CO3	Develop an appreciation of the software codes involved in software Construction
CO4	Structure and communicate ideas effectively related to projects both orally, in writing, and in cases involving a quantitative dimension in the project.
CO5	Good knowledge of tools involved in software deployment.

UNIT-1 INTRODUCTION TO SOFTWARE ENGINEERING AND REQUIREMENT ENGINEERING (9)

Software Engineering Fundamentals-Software processes-Software life-cycle and process models-Process assessment models-Overview of Project Management activities-Software requirements and specifications-Requirements Elicitation- Functional and Non Functional Requirements.

UNIT -2 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 –Component level Design: Designing Class based components, traditional Components.

UNIT-3 SOFTWARE VALIDATION AND MAINTENANCE (9)

Fundamental design concept sand principles-Design characteristics-Modularity-Architectural design-System structuring-Control models-Structured Design.

UNIT-4 FUNDAMENTALS OF SOFTWARE TESTING (9)

Definition of Testing-Approaches to Testing-Popular Definitions of Testing-Testing during Development Life Cycle-Requirements Traceability Matrix-Essentials of Software Testing-Workbench-Important Features of Testing Process-Test Planning-Test Team Approach-Testing Process-Test Methodologies/Approaches-Skills Required by Tester.

UNIT-5 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(L:45): 45 PERIODS

TEXT BOOKS:

1. Ian Sommerville, "Software Engineering, Watts Humphrey, “Managing the Software Process,” 10th Edition 2015 Pearson.
2. Software Testing, by M.G.LIMAYE, Tata McGraw-Hill, 2014.(Unit 4).3.
3. Pankaj Jalote, “Software Engineering, A Precise Approach”, Wiley India, 2010.

REFERENCE:

1. Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, Seventh Edition, Mc Graw-Hill International Edition, 2010.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of Cos and Pos												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x				x					
2	x	x					x					
3		x	x			x	x					
4							x		x			
5							x		x			

15IT305 - MICROPROCESSOR AND INTERFACING

L	T	P	C
3	0	0	3

OBJECTIVE :

- To introduce the basic concepts of microprocessors and assembly language programming.

COURSE OUTCOMES:

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

CO1	Identify the basic elements and functions of contemporary microprocessors.
CO2	Program a microprocessor to perform various tasks.
CO3	Interface a microprocessor to various devices.
CO4	Design and implement a microprocessor based system.
CO5	Know the advanced multicore processor architectures.

UNIT-1 INTRODUCTION TO MICROPROCESSOR (10)

Basic Concepts of Microprocessors and Microprocessor-based system, 8085 Microprocessor Unit (MPU)- Communication and Bus Timing- functional block diagram, Timing and control unit, op-code fetch, memory read/write, I/O read/write machine cycles.

UNIT -2 INSTRUCTION SET AND PROGRAMMING (10)

Assembly Language Programming Basics, Classification of Instructions, Addressing Modes, 8085 Instruction Set, Instruction And Data Formats ,Writing, Assembling & Executing A Program, Debugging The Programs, Writing 8085 assembly language programs with decision making and looping using data transfer, arithmetic, logical and branch instructions.

UNIT-3 INTERFACING CONCEPTS (10)

Basic Interfacing Concepts-I/O instruction-execution- ports, Interfacing Output Device- seven segments LED, Interfacing Input Devices-DIP switch. Programmable Peripheral Interface- Intel 8255 pin configuration- internal structure - modes of operation- programming, Programmable Interval Timer-Intel 8253 pin configuration- internal block diagram of counter and modes of operation- programming, Programmable Keyboard and Display Interface – Intel 8279 block diagram – mode of operation.

UNIT-4 NEW ARCHITECTURE (7)

Multicore, Multicore Architectures, The Software Developer's Viewpoint, The Bus Connections, Single Core to Multicore.

UNIT-5 MULTICORE DESIGN (8)

The AMD Multicore Opteron - Opteron's Direct Connect and Hyper Transport- System Request Interface and Crossbar - Cache and the Multiprocessor Opteron, The Sun UltraSparc T1 Multiprocessor- Program Profile- UltraSparc T1 Cores- Cross Talk and The Crossbar- DDRAM Controller and L2 Cache, The IBM Cell Broadband Engine- CBE Memory Models, Intel Core 2 Duo Processor- Intel's PCI Express- Core 2 Duo's Instruction Set.

TOTAL(L:45): 45 PERIODS

TEXT BOOKS:

1. Microprocessor Architecture, Programming and Applications with the 8085- Ramesh S Gaonkar, 6th Edition, Oct-2013, Penram International.

2. Professional Multicore Programming Design and Implementation for C++ Developers- Cameron Hughes Tracey Hughes, 2009, Wiley Publishing, Inc.

REFERENCES:

1. Advanced Microprocessor and Peripherals- A.K.Ray and K.M. Bhurchandi, 3rd Edition, June- 2012, Tata McGraw Hill.

2. http://gtu.ac.in/syllabus/NEW%20BE/Sem5/2150707.pdf

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x					
2	x	x					x		x		x	
3	x	x	x				x		x			
4	x	x	x				x					**x**
5	x	x	x				x					**x**

15IT311 - OPERATING SYSTEM PRINCIPLES LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES :

- Learn shell programming and the use of filters in the UNIX environment.
- Be exposed to programming in C using system calls.
- Learn to use the file system related system calls.
- Be exposed to process creation and inter process communication.
- Be familiar with implementation of CPU Scheduling, page replacement algorithms and Deadlock avoidance.

COURSE OUTCOMES:

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

CO1	Implement deadlock avoidance, and Detection Algorithms.
CO2	Compare the performance of various CPU Scheduling Algorithm.
CO3	Critically analyze the performance of the various page replacement algorithms.
CO4	Create processes and implement IPC.
CO5	Creating threads and implement synchronization.

LIST OF EXPERIMENTS :

1. Basics of UNIX commands.
2. Shell Programming.
3. Implement the following CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority
4. Implement all file allocation strategies a)Sequential b) Indexed c) Linked
5. Implement Semaphores.
6. Implement all File Organization Techniques.
7. Single level directory a) Two level b) Hierarchical c) DAG
8. Implement Bankers Algorithm for Dead Lock Avoidance.
9. Implement an Algorithm for Dead Lock Detection.
10. Implement e all page replacement algorithms a) FIFO b) LRU c) LFU
11. Implement Shared memory and IPC.
12. Implement Paging Technique of memory management.
13. Implement Threading & Synchronization Applications.

TOTAL (P:30): 30 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x		x		x	
2		x				x				x		
3					x							
4	x		x				x					
5			x				x					x

15IT312 - OBJECT ORIENTED PROGRAMMING USING C++ LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES :

- To demonstrate C++ syntax and semantics.
- To demonstrate fundamental object-oriented programming techniques using C++ data abstraction, information hiding, encapsulation, inheritance, and polymorphism.

COURSE OUTCOMES:

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

CO1	To understand object-oriented concepts and how they are supported by C++
CO2	To demonstrate the ability to analyze, use, and create functions, classes, to overload operators.
CO3	To create and initialize real world entities using constructors.
CO4	To understand and use Exception handling and file handling mechanism.
CO5	To apply the concepts of data encapsulation, inheritance, and polymorphism to develop large scale software.

LIST OF EXPERIMENTS

1. Program illustrating C++ basic concepts like datatypes, statements.
2. Program illustrating Classes, objects, functions and data members.
3. Programs illustrating the use of following functions:
   a) Friend functions b) Inline functions c) Static Member functions d) Functions with default arguments.
4. Programs illustrating the use of destructor and the various types of constructors (no arguments, constructor, constructor with arguments, copy constructor etc).
5. Program illustrating
6. a) Function overloading
   b) Operator overloading (Binary operators, Unary operators etc.)
7. Programs illustrating class templates and function templates.
8. Write programs illustrating how exceptions are handled (ex: division-by-zero, overflow and underflow in stack etc)
9. Programs illustrating the various forms of inheritance: Ex. Single, Multiple, multilevel, hierarchical inheritance etc.
10. Write a program illustrating the use of virtual functions.
11. Write programs illustrating ASCII and Binary file handling.

TOTAL (P:60) : 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x		x		x		x		x	
2		x		x		x				x		
3					x							
4	x		x				x					
5			x				x				x	x

15IT313 - MICROPROCESSOR AND INTERFACING LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVE :

- To introduce the basic concepts of microprocessors assembly language programming and interfacing with other devices.

COURSE OUTCOMES:

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

CO1	Identify the basic elements and functions of contemporary microprocessors.
CO2	Know the working principles of interfacing devices.
CO3	Program a microprocessor to perform various tasks.
CO4	Interface a microprocessor to various devices and program it.
CO5	Design and implement a microprocessor –based system.

LIST OF EXPERIMENTS:

1. Study of 8085 Microprocessor Kit.
2. Study of 8255, 8253, 8279 interfaces.
3. Write an ALP to Perform 8 bit Arithmetic operations using 8085.
4. Write an ALP to Sorting of string in ascending order/ descending order using 8085.
5. Write an ALP to Smallest/Largest in array of data using 8085.
6. Write an ALP to generate sum of N natural number using 8085.
7. Write an ALP to move block of data using 8085.
8. Write an ALP to reverse the string using 8085.
9. Write an ALP to Interfacing 8085 with 8255
10. Write an ALP to Interfacing 8085 with 8279.
11. Write an ALP to interfacing 8085with 8253.

TOTAL (P:30): 30 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x					
2	x	x					x		x		x	
3	x	x	x				x		x			
4	x	x	x				x					x
5	x	x	x				x					x

15GYC12- SOFT SKILLS – LISTENING AND SPEAKING

L	T	P	C
0	0	2	0

OBJECTIVES:

To enable students

- To recollect the functional understanding of basic grammar and its structure.
- To acquire the listening skills through note completion, matching and multiple choice modes
- To develop speaking skills through self introduction, short talk and topic discussion.

COURSE OUTCOMES:

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

CO1	At the end of this course, student shall be able to
CO2	Apply the knowledge of basic grammar to classify the types of verbs and questions and to construct the sentences . Develop the listening skills through note completion, matching and multiple choice modes.
CO3	Organize a presentation on the given topic.

UNIT I: Grammar **(10)**

Tenses – Verb (Auxiliary and Modal) – 'Yes/No' Type Questions – Reported Speech – Gerund – Phrasal Verbs

UNIT II: Listening **(10)**

Part I: Note completion

Part II: Matching

Part III: Multiple Choice

UNIT III: Speaking **(10)**

Part I: Self-Introduction

Part II: Short Talk on Business Topics

Part III: Topic Discussion in Pairs

TOTAL (P:30) = 30 PERIODS

REFERENCES:

1. Murphy, Raymond, "Essential Grammar in Use", Cambridge University Press, UK, 2007.
2. Whitby, Norman ,"Business Benchmark Pre- Intermediate to Intermediate Preliminary, Cambridge University Press, Second Edition , 2013

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1												x
2									x		x	
3									x			

SEMESTER IV

15MY404 - PROBABILITY AND QUEUEING THEORY
(Use of Normal Distribution Table is permitted)
(Common to CSE & IT Branches)

L	T	P	C
3	2	0	4

OBJECTIVES:

- Acquire knowledge of the random variable and manipulate some standard distributions.
- Queuing theory provides models for a number of situations that arise in real life.

COURSE OUTCOMES:

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

CO1	Have a fundamental knowledge of the basic probability concepts.
CO2	Have a well-founded knowledge of standard distributions which can describe the real life Phenomena.
CO3	Acquire skills in handling situations involving more than one random variable and Functions of random variables.
CO4	Understand and characterize phenomena which evolve with respect to time in a Probabilistic manner.
CO5	Identify and analyze appropriate queuing model to reduce the waiting time in Queue.

UNIT I PROBABILITY-ONE DIMENSIONAL RANDOM VARIABLE (9)

Axioms of Probability-conditional Probability-Total Probability-Baye's Theorem -Random variable-Probability mass function – Probability density function – Properties – Moments.

UNIT II STANDARD DISTRIBUTIONS (9)

Discrete distributions: Binomial, Poisson and Geometric- Continuous distribution: Uniform, Exponential and normal distributions and its properties.

UNIT- III TWO DIMENSIONAL RANDOM VARIABLES (9)

Joint distributions-Marginal and conditional distributions-Covariance-Correlation and Regression-Transformation of random variables.

UNIT - IV RANDOM PROCESS AND MARKOV CHAIN (9)

Classification-Stationary process-Poisson process-Markov Chain-Transition probabilities-Limiting distributions.

UNIT V QUEUEING THEORY (9)

M/M/1):(∞/FIFO),(M/M/C):(∞/FIFO),(M/M/1):(n /FIFO), (M/M/C):(n/FIFO)-(M/G/1)queue – Pollaczek - Khintchine Formula.

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

TEXT BOOKS:

1. Ibe, C. Oliver, "Fundamentals of Applied Probability and Random Processes", Elsevier, New Delhi, 2009.
2. Gross, Donald and Harris, M. Carl," Fundamentals of Queuing Theory", Wiley Publications, New Delhi, 2009.
3. Veerarajan.T,"Probability, Statistics and Random Processes", Second Edition Tata McGraw-Hill, New Delhi, 2006.

REFERENCES:

1. Allen, O. Arnold, "Probability, Statistics and Queuing Theory with Computer Applications "2nd Ed._ Elsevier, New Delhi, 2009.
2. Taha,H.A., "Operations Research - An Introduction", 8th Ed.Pearson Education, New Delhi, 2008.
3. Trivedi, S.K, "Probability and Statistics with Reliability, Queuing and Computer Science Applications", 2nd Ed. John Wiley & Sons, New Delhi, 2002.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x			x		x
2	x	x		x	x		x					x
3	x		x	x	x		x			x		x
4	x	x	x		x	x	x			x		x
5	x			x	x		x					x

15IT401 - DATABASE MANAGEMENT SYSTEMS

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand the different issues involved in the design and implementation of a database system.
- To study the physical and logical database designs, database modeling.
- To understand and use data manipulation language to query, update, and manage a database
- To develop an understanding of essential DBMS concepts.
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

COURSE OUTCOMES:

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

CO1	Describe the role of Database Management System in an Organization.
CO2	Basic database concepts including the structure and operations of the relational data model.
CO3	Construct simple and Moderately advanced database queries using SQL.
CO4	Apply logical database design principles includes E-R diagrams & Normalization.
CO5	Explain various file organizing & Indexing structure.

UNIT-1 INTRODUCTION TO DBMS (9)

Introduction to Database systems: Overview, Advantages of DBMS - view of data – Architecture - data dictionary – Levels of Abstraction, data Independence, Data Models: Data Model Definition, Types of data models, Entity Relationship Model: ER Model, Entities, Attributes and Entity Sets, Relationships and relationship sets.

UNIT -2 RELATIONAL DATABASE MANAGEMENT SYSTEM (9)

Structure of relational Databases– Integrity constraints- Relational Algebra- Relational Calculus- SQL Concepts: DDL, DML, DCL -- Stored procedures and triggers.

UNIT-3 DATA BASE & DESIGN (9)

Functional Dependency, Different anomalies in designing a Database., Normalization using functional dependencies, Decomposition, Boyce/Codd Normal Form, 3NF, Normalization using multi-valued dependencies, 4NF, 5NF.

UNIT-4 TRANSACTION PROCESSING & CONCURRENCY CONTROL (9)

Transaction Concepts -ACID Properties – Two Phase Commit - Save Points - Concurrency – Need for Concurrency – Locking Protocols – Timestamps based protocols- Validation based protocols- RAID.

UNIT-5 FILE ORGANIZATION & INDEX STRUCTURE (9)

Storage and File Structure- Indexing & Hashing- Recovery systems- Overview of Data warehousing.

TOTAL(L:45): 45 PERIODS

TEXT BOOK:

1. Henry F Korth, Abraham Silberschatz, S. Sudharshan, “Database System Concepts”, Sixth Edition, McGraw Hill, 2006.

REFERENCES:

1. R. Elmasri, S.B. Navathe, “Fundamentals of Database Systems”, Fifth Edition, Pearson Education/Addison Wesley, 2007.
2. Thomas Cannolly and Carolyn Begg, “Database Systems, A Practical Approach to Design, Implementation and Management”, Third Edition, Pearson Education, 2007.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x			x		x
2	x	x		x	x		x					x
3	x		x	x	x		x			x		x
4	x	x	x		x	x	x			x		x
5	x			x	x		x					x

15IT402 - PROGRAMMING WITH JAVA

L	T	P	C
3	0	0	3

OBJECTIVES :

- To learn the syntax of JAVA language.
- To learn the basic concepts of OOPs.
- To learn advanced concepts such as AWT, Applet, Packages, Exception Handling.

COURSE OUTCOMES:

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

CO1	Able to understand the basic concepts of JAVA
CO2	Able to understand OOPs concepts with JAVA
CO3	Understanding the advanced OOPs concepts like Inheritance, Polymorphism.
CO4	Understanding the concepts of Interfaces, Packages and Threads.
CO5	Able to design a GUI using AWT and to work with Database using database connectivity.

UNIT I JAVA FUNDAMENTALS (10)

Introduction of Java: Java Environment - Features Of Java – Application of Java – Java Programming Structure – Data Types –Statements – Operators – Arrays – Control statements - Simple Java Program – Execution of Java Program.

UNIT II OOPS CONCEPT WITH JAVA (8)

Basics of Oops Concepts : Class – Objects – Methods – Nested Class – Constructor – finalizer –Access Control – Keywords : static –final - this - String – String Buffer – Vector - Arrays – Wrapper Class.

UNIT-III INHERITANCE, EXCEPTION HANDLING and FILES (9)

Inheritance: Types Of Inheritance – Polymorphism – Method Overloading – Method Overriding- super – final with inheritance – Abstract Class - Exception Handling – File and I/O Streams.

UNIT- IV INTERFACES, PACKAGES AND THREADS (9)

Java Interfaces, Packages, and Threads: Interfaces – Interface Design – Packages – Package Hierarchy – Threads Programming and Handling – Thread Synchronization - Multi-Thread Programming.

UNIT- V GUI with JAVA (9)

Java GUI: Basic elements of AWT - Applet programming - Events Handling – Database Connectivity - Basics of JDBC.

TOTAL(L:45): 45 PERIODS

TEXT BOOKS:

1. Ken Arnold, James Gosling, David Holmes, “The Java Programming Language 3e,” A-W, 4th ed,2005.
2. CS. Horstmann, G. Cornell, “Core Java Vol I – Fundamental,” Sun,9th ed ,2012. 3. Ivor Horton, “Beginning Java 2/5,” Wrox,2002.

REFERENCES:

1. P. Naughton, H. Schildt, “Java The Complete Reference 4e,” Tata McGraw-Hill,8th ed,2003.
2. http://java.sun.com/docs/books/tutorial
3. Deitel & Deitel, “Java How to Program,” PH-India,9th ed,2011.
4. Richarson, et al, Wrox, “Professional Java,” 6th ed ,2007.
5. Kim Topley, “Core Swing Advanced Programming,” Pearson, 1999.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x		x				x		x
2	x		x	x		x				x		x
3	x		x	x		x				x		x
4	x		x	x		x				x		x
5	x		x	x		x				x		x

15IT403 - COMPUTER NETWORKS AND INTERNETS

L	T	P	C
3	0	0	3

OBJECTIVE :

- This course provides an understanding of the various principles, protocols and design aspects of Computer Networking.

COURSE OUTCOMES:

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

CO1	Explain how communication works in data networks and the Internet.
CO2	Explain the role of protocols in networking.
CO3	Analyze the services and features of the various layers of data networks.
CO4	Design, calculate, and apply subnet masks and addresses to fulfill networking requirements.
CO5	Analyze the features and operations of various application layer protocols such as Http, DNS and SMTP.

UNIT- I DATA COMMUNICATIONS (9)

Components of Network – Data Flow – Types of Connection - Networking devices : hubs , switches, gateways, repeaters, Bridges and routers, Modem and its types - Network Topologies -Categories of Network – Internetwork & Intranetwork – Protocols and its standards - ISO / OSI Reference Model -Addressing : Physical, Logical, Port & Specific addresses - Transmission Media : Guided Media and Unguided Media.

UNIT - II DATA LINK LAYER (9)

Data Link Layer : Duties of DLL –Types of Error - Error Correction & Detection - Framing - Flow and Error Control - Noisy Channels & Noiseless channels - Wired LAN : Ethernet –LLC and MAC - IEEE standards : 802.3,802.4 & 802.5 – Wireless LAN : IEEE 802.11 – Bluetooth.

UNIT- III NETWORK LAYER (12)

Switching : Packet Switching, Datagram Approach and Virtual Circuit Networks – Logical Addressing : IPv4 – Internet Protocol :Need for Network Layer - IPv4 & IPv6 – Transition from IPv4 to IPv6 – Mapping : ARP,RARP,BOOTP & DHCP - Sub netting –CIDR,BGP – Routing Protocols : RIP,OSPF.

UNIT- IV TRANSPORT LAYER (9)

Duties of Transport Layer - Sockets - Process to process delivery - Concepts of User Datagram Protocol(UDP) - Concepts of Transmission Control Protocol(TCP) – Congestion Control – Quality of service – Techniques to achieve QoS.

UNIT- V APPLICATION LAYER (6)

Domain Name Space (DNS) –Remote Logging – Email (SMTP, MIME, IMAP,POP3) – HTTP – SNMP – FTP - WWW –Security.

TOTAL(L:45): 45 PERIODS

TEXT BOOK:

1. Behrouz A. Forouzan, “Data Communication and Networking”, 5thEdition, Tata McGraw-Hill, 2013 .

REFERENCES:

1. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Third Edition, Morgan Kauffmann Publishers Inc., 2003.
2. James F. Kuros, Keith W. Ross, “Computer Networking, A Top-Down Approach Featuring the Internet”, Third Edition, Addison Wesley, 2004.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x				x		x	x	x
2	x	x	x					x			x	x
3	x							x		x	x	x
4	x		x		x			x			x	X
5		x	x			x		x	x	x		

15CS403 - COMPUTER ARCHITECTURE AND ORGANIZATION

(Common to CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the basic structure of digital computer.
- To study the design of arithmetic and logic unit and implementation of fixed point and Floating-point arithmetic operations.
- To perceive knowledge about internal and external memory technologies.
- To know the different kinds of I/O interfaces, Processing and pipelining.

COURSE OUTCOMES:

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

CO1	Define the Purpose of functional units of the System.
CO2	Solve basic binary math operation.
CO3	Understand the variety of memory technologies.
CO4	Apply the appropriate interfacing techniques for the project.
CO5	Describe the instruction execution and Pipelining concepts.

UNIT – I BASIC STRUCTURE OF COMPUTERS **(9)**

Functional Units – Basic Operational Concepts – Bus Structures – Performance and Metrics – Instructions and Instruction Sequencing – Software – Memory Operations – Instruction Set Characteristics and Functions – Addressing Modes – RISC – CISC.

(9)

UNIT - II COMPUTER ARITHMETIC

Data Representation – Hardware and Software Implementation of Arithmetic Unit for Common Arithmetic Operations: Addition, Subtraction, Multiplication, Division (Fixed point and floating point) – Design of Fast Address.

(9)

UNIT- III MEMORY SYSTEM

Basic Concepts – Semiconductor RAM – ROM – Speed – Size and Cost – Cache Memories – Improving Cache Performance – Virtual Memory – Memory Management Requirements –Secondary Storage Devices.

(9)

UNIT - IV I/O ORGANIZATION

Accessing I/O Devices – Programmed Input/output – Interrupts – Direct Memory Access – Buses – Interface Circuits – Standard I/O Interfaces (PCI, SCSI, USB) – Computer Peripherals.

(9)

UNIT- V PROCESSING UNIT AND PIPELINING

Fundamental Concepts – Execution of Complete Instruction – Hardware Control – Micro Programmed Control – Pipelining Basic Concepts – Data Hazards – Instruction Hazards – Data Path and Control Considerations – Superscalar Operations – Performance Considerations.

TOTAL (L:45) : 45 PERIODS

TEXT BOOK:

1. Carl Hamacher, ZvonkoVranesic and SafwatZaky, “Computer Organization”, Fifth Edition, Tata McGraw Hill, 2011.

REFERENCES:

1. William Stallings, “Computer Organization and Architecture – Designing for Performance”, International Edition, Pearson Education, 2013.
2. David A. Patterson and John L. Hennessy, “Computer Organization and Design: The Hardware/Software interface”, Fifth Edition, Elsevier, 2014.
3. John P. Hayes, “Computer Architecture and Organization”, Third Edition, Tata McGraw Hill, 1998.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs											
COs	**POs**										
	1	2	3	4	5	6	7	8	9	10	11
1	x	x					x			x	x
2	x	x	x				x			x	
3	x	x	x				x		x		x
4	x	x	x				x	x	x		x
5	x	x	x				x				x

15IT404 - ANALOG AND DIGITAL COMMUNICATION

L	T	P	C
3	0	0	3

OBJECTIVES :

- To have understanding about different types of Communication systems .
- To gain knowledge about different digital modulation techniques for digital transmission.
- To have knowledge about base band data transmission and adaptive equalization techniques.
- To know the band-pass modulation techniques.

COURSE OUTCOMES:

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

CO1	Explain the principles of analog and digital communications and its applications.
CO2	Explain the working principles of modulation schemes, coding and information theory.
CO3	Differentiate analog and digital communication systems.
CO4	Understand the concepts of modern modulation methods
CO5	Demonstrate about Time and frequency division multiplexing techniques.

UNIT-1 AMPLITUDE MODULATION **(9)**

Elements of Communication Systems – AM: Theory, Envelope Detection, Limitations- Double Sideband Suppressed Carrier Modulation: Theory, Coherent Detection –Quadrature Carrier Multiplexing – Single Sideband Modulation: Theory, Modulators for SSB, Coherent Detection, Frequency Translation- Vestigial Sideband Modulation: Motivation, Sideband Shaping Filter, Coherent Detection.

UNIT -2 ANGLE MODULATION **(9)**

Angle Modulation: Basic Definitions, Properties, Relationship between PM and FM waves- Narrow band Frequency Modulation –Wide band Frequency Modulation: Bandwidth, Generation of FM waves - Demodulation of FM signals: Frequency Discriminator, Phase Locked Loop, FM Stereo Multiplexing.

UNIT-3 PULSE MODULATION **(9)**

Sampling Process: Sampling Theorem – Pulse Amplitude Modulation: Sample and Hold Filter- Pulse Position Modulation -Transition from Analog to Digital: Quantization process- Pulse Code Modulation: Regeneration of signal in channel- Delta Modulation: System details, Quantization Errors, Delta/Sigma Modulation - Differential Pulse Code Modulation - Line codes- Time Division Multiplexing: Synchronization, Impulse Radio.

UNIT-4 BASEBAND DATA TRANSMISSION **(9)**

Baseband Transmission of Digital Data -The Inter Symbol Interference problem - The Nyquist Channel – Raised cosine pulse spectrum: Transmission Bandwidth Requirement, Additional Properties – M-ary Data Transmission - The Eye Pattern - Equalization: Zero Forcing Equalization**.**

UNIT-5 DIGITAL BAND-PASS MODULATION TECHNIQUES **(9)**

Preliminaries- Binary Amplitude Shift Keying- Phase Shift Keying: Binary Phase Shift Keying (BPSK), Generation and Coherent Detection of BPSK signals, Quadriphase Shift Keying, Generation and Coherent Detection of QPSK signals, Offset Quadriphase-Shift Keying- Frequency Shift Keying: Binary Frequency Shift Keying, Continuous-Phase Frequency Shift Keying, Minimum-Shift Keying – Noncoherent Digital Modulation Schemes: Differential Phase-Shift Keying -Orthogonal Frequency Division Multiplexing.

TOTAL (L:45) : 45 PERIODS

TEXT BOOK:

1. Simon Haykin and Michael Moher, “Introduction to Analog and Digital Communications”, John Wiley, Second Edition 2007.

REFERENCES:

1. H.Taub,D L Schilling ,G Saha , “Principles of Communication”,3/e,2007.
2. Bernard Sklar,”Digital Communication: fundamentals and applications”, Addision Wesley, 2nd Edition, 2007.
3. T L Singal, “Analog & Digital Communications”,Tata McGraw-Hill Education,2012.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x				x	x		x	x
2	x			x				x			x	
3	x		x	x				x				
4			x	x		x		x	x	x		
5	x		x	x		x		x			x	x

15IT411 - DATABASE MANAGEMENT SYSTEMS LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES :

- To provide a strong formal foundation in database concepts, technology and practice.
- To give a good formal foundation on the relational model of data to present SQL and procedural interfaces to SQL comprehensively.
- To give an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design.

COURSE OUTCOMES:

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

CO1	To design a database system effectively.
CO2	Understand & effectively explain the concept of database technologies.
CO3	Design and implement database schema for given problem domain.
CO4	Populate and query a database using SQL – DDL, DML commands.
CO5	To learn about joins, views, and various built in functions.

LIST OF EXPERIMENTS :

1. Structured Query Language : Creating Database
   - Creating a Table
   - Specifying Relational Data Types
   - Specifying Constraints
   - Creating Indexes
2. Table and Record Handling
   - INSERT statement
   - Using SELECT and INSERT together
   - DELETE, UPDATE, TRUNCATE statements
   - DROP, ALTER statements
3. Retrieving Data from a Database
   - The SELECT statement
   - Using the WHERE clause
   - Using Logical Operators in the WHERE clause
   - Using IN, BETWEEN, LIKE, ORDER BY, GROUP BY and HAVING Clause
   - Using Aggregate Functions
   - Combining Tables Using JOINS
   - Sub queries

4. Database Management
   - Creating Views
   - Creating Column Aliases
   - Creating Database Users
   - Using GRANT and REVOKE
5. High level language extension with Triggers
6. Procedures and Functions
7. Database design using E-R model and Normalization
8. Design and implementation of real time application such as Payroll processing system, Banking system, Library Information System, Student Evaluation System

TOTAL (P:60): 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x			x		x
2	x	x		x	x		x					x
3	x		x	x	x		x			x		x
4	x	x	x		x	x	x			x		x
5	x			x	x		x					x

15IT412 - PROGRAMMING WITH JAVA LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES :

- To learn Java syntax and able to develop Java application
- To apply OOPs concepts in Java Programming and understand the concepts of Inheritance, Polymorphism and Threads
- To develop GUI using Swing.

COURSE OUTCOMES:

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

CO1	Developing java application with different Java elements.
CO2	Understanding about String concepts.
CO3	Programming on different OOPs concepts.
CO4	Working with Packages, threads ad Exception Handling.
CO5	Developing GUI with AWT& ddeveloping 3Tier applications

LIST OF EXPERIMENTS

1. Programs with basic elements of Java.

2. Programs with different access specifiers, Operators, IO streams.

3. Programs with control structures.

4. Programs to handle Strings, String buffer and its built-in functions.

5. Programs on various OOPs concepts such as Class, Object, Inheritance, Abstraction, Overloading etc.

6. Programs on Packages and Exception Handling.

7. Programs on Threads.

8. Programs on GUI designing using AWT.

9. Programs for creating application with DB connectivity using JDBC.

10. Programs with Interfaces.

11. Creation of 3 tier Application.

TOTAL (P:30): 30 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x		x	x			x		
2	x	x	x	x		x	x			x		
3	x	x	x	x		x	x			x		
4	x	x	x	x		x	x			x		
5	x	x	x	x		x	x			x		

15IT413 - COMPUTER NETWORKS AND INTERNETS LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVE :

- To have a thorough knowledge in computer networking. To visualize the net working concepts in the real world. To understand the working & basics of the various networking protocols**.**

COURSE OUTCOMES:

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

CO1	Implementing networking protocols of various OSI layers in C / C++ / Java.
CO2	Implementing routing protocols in C / C++ / Java.
CO3	Study of various networking and inter – networking devices.
CO4	Studying client – server programming using TCP and UDP sockets .
CO5	Study of important command line utilities involved in computer networks.

LIST OF EXPERIMENTS :

1. Network Layer Concepts(Identification of Network Components, Configuration of IP)
2. Implementation of Network commands.
3. Network Design for an organization.
4. Transport Layer: Datagram (UDP) socket programming.
5. Transport Layer: Stream (TCP) socket Programming.
6. Implementation of Routing and Flow Control algorithms.
7. Application Layer: SMTP and HTTP programming.
8. Experiment on packet capturing and analyzing tools.
9. A study on Network Simulator tools.

TOTAL (P:30): 30 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x			x			x	x	x
2			x	x		x	x				x	x
3			x	x			x		x	x	x	x
4	x		x	x			x	x		x		x
5	x			x			x	x			x	x

15GYC13 - SOFT SKILLS – READING AND WRITING

L	T	P	C
0	0	2	0

OBJECTIVES:

- To recollect the functional understanding of parts of speech and basic grammar.
- To acquire the reading skills through cloze texts, matching and multiple choice modes .
- To enhance the writing skills for a variety of purposes.

COURSE OUTCOMES:

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

CO1	Apply the knowledge to identify the parts of speech and construct the sentences.
CO2	Develop the reading skills through cloze texts, matching and multiple choice modes.
CO3	Interpret effectively through writing for a variety of purposes.

UNIT I: Grammar **(10)**

Articles – Adjectives – Conjunctions – Prepositions – Idioms & Phrases.

UNIT II: Reading **(10)**

Part I: Matching 7 sentences to four short texts.

Part II: Text with sentences missing.

Part III: Text with multiple choice questions.

Part IV: Text with multiple choice gaps.

Part V: Identification of additional unnecessary words in text.

UNIT III: Writing **(10)**

Part I: E-mail writing, Writing short notes, Memo, Agenda & Minutes.

Part II: Report Writing, Complaint Letter, Writing Proposals.

TOTAL (P:30): 30 PERIODS

REFERENCE BOOKS:

1. Murphy, Raymond, “Essential Grammar in Use”, Cambridge University Press, UK, 2007.
2. Whitby, Norman ,”Business Benchmark” Pre- Intermediate to Intermediate Preliminary, Cambridge. .University Press, Second Edition , 2013.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1												x
2									x		x	
3									x			

SEMESTER V

15MY502 - NUMERICAL METHODS & OPERATIONS RESEARCH

L	T	P	C
3	2	0	4

OBJECTIVES:

- Find numerical approximations to the roots of an equation by Newton method, numerical solution to a system of linear equations by Gaussian Elimination and Gauss-Siedel.
- Find the Lagrange Interpolation Polynomial for any given set of points.
- Apply several methods of numerical differentiation and integration, including Romberg integration.
- To understand network modelling for planning and scheduling the project activities.
- To provide Techniques for Analysis and Modelling in Computer Applications.

COURSE OUTCOMES:

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

CO1 : The students would be acquainted with the basic concepts in numerical methods and their Uses.

. CO2 : When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values.

CO3 : Explain the consequences of finite precision and the inherent limits of the numerical methods considered.

CO4 : Prepare project scheduling using PERT and CPM.

CO5: Appraise theoretical predictions obtained from Game Theory analyses against real world conflicts.

UNIT I SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS (9+6)

Solution of equation – Method of criteria for convergence - Iteration method : x = g(x) method – Newton Raphson method – Solution of linear system by Gaussian elimination and Gauss - Jordon method – Iterative methods: Gauss-Seidel method – Inverse of a matrix by Gauss Jordon method – Eigen value of a matrix by power method for symmetric matrix.

UNIT II - INTERPOLATION AND APPROXIMATION (9+6)

Divided differences in unequal intervals – Interpolating with a cubic spline – Lagrangian Polynomials–Newton's forward and backward difference formulas for equal intervals.

UNIT III -NUMERICAL DIFFERENTIATION AND INTEGRATION (9+6)

Numerical Differentiation using interpolation formulae – Numerical integration by Trapezoidal and Simpson's 1/3 rule and 3/8 rule – Romberg's method – Two and Three point Gaussian quadrature formulae – Double integrals using trapezoidal and Simpson's rules.

UNIT IV PERT AND CPM (9+6)

Network Construction – Critical Path Method(CPM) – Project Evaluation and Review Technique(PERT)

UNIT V - GAME THEORY (9+6)

Definition - Pay-off - Two Person Zero - Sum Games -The Maximin - Minimax Principle - Games without Saddle Points (Mixed Strategies) - 2x2 Games without Saddle Points - Graphical Method for 2xn or mx2 Games - Dominance Property.

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

TEXT BOOKS :

1. T. Veerarajan. and T. Ramachandran., "Numerical Methods with programming in C", 2nd ed., Tata McGraw-Hill, 2006 , First reprint 2007.
2. P. Kandasamy, K.Thilagavathy and K. Gunavathy, "Numerical Methods – Vol: IV", S.Chand & Co. Ltd. New Delhi, 2003, reprint 2007.
3. V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan**,** "Resource Management Techniques", A.R.Publication, 2002.

REFERENCES :

1. C.F Gerald and P.O Wheatley, "Applied Numerical Analysis", 7th ed., Pearson Education Asia, New Delhi 2007.
2. K. Sankar Rao, "Numerical Methods for Scientists and Engineers", 3rd ed., Prentice Hall of India, New Delhi, 2007,10th reprint 2012.
3. E. Balagurusamy, "Numerical Methods", Tata McGraw-Hill, New Delhi, 1999, 25th reprint 2008.
4. M.K Venkatraman, "Numerical Methods" National Publication, New Delhi, 2000, reprint 2005.
5. Kanti swarup, P.KGupta**,** Man Mohan **"**Operations Research",Sultan Chand & Sons 2008,New Delhi.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											
2	x				x							x
3	x		x	x								x
4	x									x		
5	x									x		

15EC504 - SIGNAL PROCESSING
(Only for IT department)

L	T	P	C
3	0	0	3

OBJECTIVES :

- To review signals and systems, study DFT, FFT, and to discuss the design of IIR & FIR filters

COURSE OUTCOMES:

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

CO1 : Have details of different signals.
CO2 : Have details of different systems.
CO3 : Compute DFT using FFT algorithm
CO4 : Design IIR filter.
CO5 : Design FIR filter.

UNIT I - INTRODUCTION TO SIGNALS (9)

Signals – classification – continuous-time, discrete-time, deterministic, non-deterministic, periodic, aperiodic, even-odd, energy, power signals – elementary signals – exponential, sinusoidal, unit step, impulse, ramp – time-shifting, scaling, folding, Sampling theorem – Discrete time signals.

UNIT II - INTRODUCTION TO SYSTEMS (9)

System – classification – continuous – time/discrete-time, static/dynamic, linear/non-linear, time - invariant/variant, deterministic/stochastic, causal/non - causal, stable/unstable - time response analysis of discrete time systems- impulse response - step response**.**

UNIT III -FAST FOURIER TRANSFORMS (9)

Introduction to DFT-Efficient computation of DFT. Properties of DFT. FFT Algorithm-Radix-2- Decimation in Time (DIT)-Decimation in Frequency (DIF).Fast Convolution-Overlap Save method-Overlap Add Method.

UNIT IV -DIGITAL FIR FILTERS (9)

Design characteristics of FIR filters with linear phase – Frequency response of linear phase FIR filters – Design of FIR filters using window functions(Rectangular, Hamming, Hanning, Blackman)- Comparison of design methods of FIR filters. Realization of FIR Structure.

UNIT V -DIGITAL IIR FILTERS (9)

Review of design techniques for analog low pass filter (Butterworth and Chebyshev approximations), Frequency transformation in Analogue domain, IIR filter design –Different methods of IIR filter Design (Bilinear and Impulse Invariant Techniques). Realization of IIR Structure.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOK:

1. J.G.Proakis, D.G.Manolakis and D.Sharma, “Digital Signal Processing, Algorithms and Applications”, Pearson Education, 2012.

REFERENCES:

1. Oppenheim V.A.V and Schaffer R.W, “Discrete – time Signal Processing”, 2nd Edition, Prentice Hall, 2013.
2. S.K.Mitra, Digital Signal Processing, 4rh Edition, TMH, 2010.
3. Lawrence R Rabiner and Bernard Gold, “Theory and Application of Digital Signal Processing”, PHI 2010.
4. P.RameshBabu, “Digital Signal Processing”, 4th Edition, SciTech Publications (India) Pvt Limited, 2007.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x			x		x				x
2	x							x				
3			x					x				x
4	x							x				
5	x		x					x				x

Approved by Sixth Academic Council

15IT501 - OBJECT ORIENTED SYSTEM DESIGN

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course aims to introduce the object oriented analysis and design. Also it aims to make use of the UML notations effectively for the design of object oriented systems.
- To discuss Case studies based project specifications to develop object-oriented models and identify implementation strategies.
- To demonstrate and apply basic object oriented techniques.
- Be exposed to the various testing techniques.

COURSE OUTCOMES:

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

CO1 : Understand the basic concepts to identify state & behavior of real world objects.
CO2: Able to learn the various object oriented methodologies and choose the appropriate one for solving the problem with the help of various case studies.
CO3: Develop a project scope, and a project plan with feasibility analysis
CO4: Understand the concept of analysis, design & testing to develop a document for the project.
CO5: Able to implement analysis, design & testing phases in developing a software project.

UNIT I – INTRODUCTION **(9)**

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Information hiding – Class hierarchy – Relationships and Associations – Aggregations- Identity – Dynamic binding – Persistence – Meta classes – Object oriented system development life cycle. GRASP: Designing objects with responsibilities – Creator – Information expert.

UNIT II - METHODOLOGY AND UML **(9)**

Survey – Rumbugh, Booch, Jacobson methods – Patterns - Frameworks – Unified approach – Unified modeling language – Static and Dynamic models – UML diagrams – Use Case – Class Diagrams– Interaction Diagrams – State Diagrams – Activity Diagrams – Package, component and Deployment Diagrams.

UNIT III -OBJECT ORIENTED ANALYSIS **(9)**

Identifying Use cases – Business object analysis – Use case driven object oriented analysis – Use case model – Documentation – Classification – Identifying attributes, Identifying object, relationships methods – Super-sub class - Object responsibility.

UNIT IV -OBJECT ORIENTED DESIGN WORKFLOW **(9)**

Object Oriented Design Process – Axioms – Corollaries – Designing classes – Class visibility – Refining attributes – Methods and protocols – Object storage and object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface.

UNIT V - TESTING AND MANAGEMENT ISSUES **(9)**

Quality Issues – Non Execution Based Testing – Execution Based Testing – Cost Benefit Analysis – Risk Analysis – Improving the Process – Metrics – CPM/PERT – Choice of Programming Language – Reuse Case Studies – Portability – Planning and Estimating Duration and Cost – Testing the Project Management Plan – Maintenance and the Object Oriented Paradigm – CASE Tools for Maintenance.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Ali Bahrami, “Object Oriented System Development”, McGraw Hill International Edition, 2008.

2. John Deacon, “Object Oriented Analysis and Design”, Pearson Education, First Edition, 2009.

REFERENCE BOOK :

1. Grady Booch, James Rumbaugh, Ivar Jacobson, “The Unified Modeling Language User Guide” , Addison Wesley Long man, 1999.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x				x			x		x	x
2			x	x					x			x
3	x			x	x			x		x		
4		x	x	x	x		x		x	x	x	x
5		x		x	x					x	x	x

15IT502 - INTERNET AND WEB PROGRAMMING

L	T	P	C
3	0	2	4

OBJECTIVES :

- To learn the concepts of HTML.
- To study about CSS.
- To learn about scripting language.
- To understand the concepts of JSP and servlet.
- To learn about XML and related technologies.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1 : Develop a website using HTML.
CO2 : Design a web page using CSS.
CO3 : Perform form validation using Java Script.
CO4 : Develop web application using JSP, Servlet.
CO5 : Understand the concepts of XML and related technologies.

UNIT -1 : XHTML AND CSS (9)

HTML Introduction – Basic XHTML syntax and Semantics - HTML Elements & Attributes - Lists – Tables– Frames – Forms- Defining XHTML‟s Abstract Syntax-Creating HTML Documents; CSS -Features – Syntax – Cascading and Inheritance - Text Properties - Box Model - Flow–Other style Properties.

UNIT-2 : JAVASCRIPT (9)

JavaScript introduction - Basic Elements - Variable - Data Types - Operators and Literals –- Functions -Objects- Arrays –Built-in- Object, JavaScript Debuggers – Event Handling – Validation.

UNIT-3 : SERVLETS (9)

Java Servlets : Architecture – Overview – Servlet Generating Dynamic Content-Life Cycle-Parameter Data-Sessions-Cookies.

UNIT-4: JSP (9)

JSP : Overview – Basic JSP: Architecture - Lifecycle – Directives – Actions- Implicit Objects – JavaBeans Classes and JSP – MVC Paradigm.

UNIT-5 : XML AND WEB SERVICES (9)

Xml: Namespaces- XML Processing- -XML Documents- XSL – XSLT; Web services: WSDL-XML Schema – Introduction to SOAP.

1. Programs with HTML and CSS.
2. Programs with Java script.
3. Programs on form validation using Java Script.
4. Programs on basic JSP tags
5. Programs for creating web applications using JSP.
6. Programs on Java Bean.
7. Programs on HTTP Servlet.
8. Programs for creating web application using Servlets.
9. Creation of 3 tier Application.
10 .Programs on XML

TOTAL (L:45, P:30) = 75 PERIODS

TEXT BOOKS:

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.
2. Deitel Deitel Nieto, “Internet & World Wide Web How To Program”, 5th ed., 2012.

REFERENCES:

1. Thomas A. Powell, “The Complete Reference HTML & CSS”, 5th ed., 2010.
2. Steve Suehring, “JavaScript – Step by Step”, PHI, 2nd ed., 2010.
3. https://www.tutorialspoint.com/jsp

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and Pos												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x					x			
2		x		x	x							
3	x		x				x					
4		x	x							x		
5						x					x	x

Approved by Sixth Academic Council

15GEC02 - ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING

L	T	P	C
3	0	0	3

OBJECTIVE:

- To manage an Organization; to describe principles of macroeconomics to have the understanding of economic environment of Business.
- To acquire a reasonable knowledge in Accounts.
- To analyse and evaluate Financial Statements.

COURSE OUTCOMES:

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

CO1 Know the importance of Engineering Economics and Principles of Micro and Macro Economics.
CO2 Estimate the Market Position with the Knowledge in Demand Forecasting and Supply.
CO3 Develop and Estimate Cost for any Project.
CO4 Fix the Price of the Product with the Knowledge in different Market Structure.
CO5 Analyze the Financial Statement to determine the optimal Managerial Decisions.

UNIT I INTRODUCTION (5)

Managerial Economics – Relationship with other disciplines, Firms – Types, Objectives and Goals, Managerial Decisions, Decision Analysis.

UNIT II DEMAND AND SUPPLY ANALYSIS (10)

Demand – Types of Demand, Determinants of Demand, Demand Function, Demand Elasticity, Demand Forecasting. Supply – Determinants of Supply, Supply Function, Supply Elasticity.

UNIT III PRODUCTION AND COST ANALYSIS (10)

Production Function – Returns to scale, Production Optimization, Isoquants, and Managerial uses of Production Function. Cost Concepts – Cost Function, Determinants of Cost, Estimation of Cost.

UNIT IV PRICING (10)

Determinants of Price, Pricing under different Objectives and different Market Structures, Price Discrimination, Pricing methods in practice.

UNIT V FINANCIAL ACCOUNTING AND CAPITAL BUDGETING (10)

Introduction to Financial, Cost and Management Accounting, Accounting Concepts and Conventions, Final Accounts, Investments – Evaluation of Investment Decision – Average Rate of Return, Payback Period, Net Present Value.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Anjali Bagad, "Engineering Economics and Financial Accounting", Technical Publications 2nd Revised Edition, 2011.
2. B. Senthil Arasu, J. Praveen Paul, "Engineering Economics and Financial Accounting", SchiTech Publication (India) Pvt. Ltd.

REFERENCES:

1. McGuigan, Moyer and Harris, "Managerial Economics; Applications, Strategy and Tactics", Thomson South Western, 10th Edition, 2005.
2. Paresh Shah, "Basic Financial Accounting for Management", Oxford University Press, New Delhi, 2007.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x							x				
2	x	x	x	x					x	x		x
3		x		x					x	x	x	x
4	x	x		x			x			x		x
5		x		x						x	x	

Approved by Sixth Academic Council

15ITX01 - OBJECT ORIENTED DATABASE MANAGEMENT SYSTEM

L	T	P	C
3	0	0	3

OBJECTIVE:

- To acquire the knowledge of Database systems that allows the students to build a strong foundation to design normalized tables and object oriented database.

COURSE OUTCOMES:

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

CO1 : Apply basic concepts of relational databases.
CO2 : Analyze relational model in non-normalized structure.
CO3 : Evaluate object hierarchies.
CO4 : Understand the relation between the OQL and EOQL.
CO5 : Acquire knowledge about OODBMS Architecture.

UNIT I - INTRODUCTION (9)

Extension and formalization of basic concepts in object oriented programming and relational databases. Classes, objects, inheritance, polymorphism, encapsulation, static and dynamic binding, message sending, relational mathematics, normal forms.

UNIT II - NON-NORMALIZED STRUCTURES (9)

Handling of non-normalized structures. Extensions and generalizations of the relational model and the corresponding mathematics, modeling. Object management systems. Concepts and problems. Persistent programming. Methods and systems.

UNIT III -OBJECT ORIENTED DATABASE CONCEPT (9)

Data types and Object, Evolution of Object Oriented Concepts, Characteristics of Object Oriented Data Model. Object Hierarchies – Generalization, Specialization, Aggregation. Object Schema. Inter-object Relationships, Similarities and difference between Object Oriented Database models.

UNIT IV -OBJECT DATABASE MANAGEMENT SYSTEMS (9)

Modeling, Meta programming, transactions, garbage collection, query handling. Prototypes and user interfaces. Problems related to temporal and spatial aspects. OODBMS Architecture Approach: The Extended Relational Model Approach. Semantic Database Approach, Object Oriented Programming Language Extension Approach, DBMS Generator Approach, the Object Definition Language and the Object Query Language.

UNIT V - OBJECT ORIENTED DBMS ARCHITECTURE (9)

Performance Issue in Object Oriented DBMS, Application Selection for Object Oriented DBMS, the Database Design for an Object Relational DBMS. The Structured Typed and ADTs, Object identity, Extending the ER Model ,Storage and Access Methods, Query Processing Query Optimization, Data Access API(ODBC, DB Library, DAO, ADO, JDBC, OLEDB), Distributed Computing Concept in COM, COBRA.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Ozsu, M. Tamer and Patrick Valduriez “Principles of Distributed Database Systems;”. Pearson Education, 2014.

REFERENCES :

1. C.S.R. Prabhu, “Object Oriented Database System – Approaches and Architectures”, 2012.
2. Silberschatz, Abraham, Henry F. Korth and S. Sudarshan: “Database System Concepts” McGrawHill International Edition, 2011.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and Pos												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	X			x					x			
2		x		x	x							
3	X		x				x					
4		x	x							x		
5						x					x	x

Approved by Sixth Academic Council

15ITX02 - DATA SCIENCE AND BIG DATA ANALYTICS

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand the computational approaches to Modeling, Feature Extraction
- To analyze and interpret streaming data.
- To learn how to handle large data sets in main memory.
- To understand the various search algorithms & clustering techniques applicable to Big Data.
- To understand the need and application of Map Reduce.

COURSE OUTCOMES:

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

CO1 : Design algorithms by employing Map Reduce technique for solving Big Data problems .
CO2 : Design algorithms for Big Data by deciding on the apt Features set.
CO3 : Design algorithms for handling petabytes of datasets.
CO4 : Design algorithms and propose solutions for Big Data by optimizing main memory consumption.
CO5: Design solutions for problems in Big Data by suggesting appropriate clustering techniques.

UNIT I - INTRODUCTION TO DATA SCIENCE (9)

Data science process: Roles, Stages of a data science project –Loading data into R: working with data from files - working with relational databases. Exploring data: Using summary statistics to spot problems and spotting problems using graphics and visualization. Managing data: cleaning data and sampling for modeling and validation.

UNIT II -BIGDATA ANALYTICS (9)

Big Data overview – State of the practice in Analytics-Key Roles for the new Big data Ecosystem – Examples- Data Analytics Lifecycle: Discovery-Data preparation – Model Planning – Model Building – Communicate results – Operationalize.

UNIT III -R PROGRAMMING (9)

Overview – Environment Setup – Basic Syntax – Data Types – Variables – Operators – Decision Making – Loops – Function – Strings – Vectors – Lists – Matrices – Arrays – Factors – Data Frames - R Data Interfaces : CSV Files – Excel files – Binary files – XML files – Databases. R Charts & Graphs: Pie chart – Bar Chart – Box plots – Histograms – Line Graphs – Scatter plots.

UNIT IV -ADVANCED ANALYTICAL THEORY AND METHODS (9)

Clustering: Overview-K means-Association Rules: A priori Algorithm -Evaluation of Candidate Rules -Applications of Association Rules – Regression: Linear Regression – Logistic Regression.

UNIT V -ADVANCED ANALYTICS: METHODS, TECHNOLOGY AND TOOLS (9)

Classification: Decision Trees : Overview – General algorithm – Decision Tree Algorithm – Evaluating a Decision Tree. Naive Bayes : Bayes' Theorem – Naïve Bayes Classifier. Tools: Overview of MapReduce and Hadoop Ecosystem.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. EMC Education Services, "Data Science and Big Data Analytics : Discovering, Analyzing, Visualizing and Presenting Data", John Wiley & Sons Publications, (UNIT II – V), 2015.
2. John Mount, Nina Zumel, "Practical Data Science with R", Manning Publications (UNIT I), 2016.

REFERENCES:

1. Jure Leskovec, Anand Rajaraman, Jeffrey D. Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2014.
2. Mark Gardener, “Beginning R - The Statistical Programming Language”, John Wiley & Sons, Inc., 2012.
3. W. N. Venables, D. M. Smith and the R Core Team, “An Introduction to R”, 2013.
4. Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, Abhijit Dasgupta, “Practical DataScience Cookbook”, Packet Publishing Ltd., 2014.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x						x		x
2								x				
3											x	x
4					x		x			x		
5				x		x				x		x

15ITX03 - ADVANCED DATABASE MANAGEMENT SYSTEM

L	T	P	C
3	0	0	3

OBJECTIVES :

- Learning state-of-art techniques in database systems and information management that you can apply to your future research and/or your practical work.
- Learning how the prepare and present technical papers which is an essential skill for students and researchers.

COURSE OUTCOMES:

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

CO1 : Knowledge and understanding normalization techniques.
CO2 : Understand how transactions are processed in a database.
CO3 : Discuss/explain the concepts of Distributed Databases and Data Warehousing and some database security issues.
CO4 : Different techniques in Concurrency Control, Tune and Optimize some Database applications.
CO5 : Carefully explain the concepts of Object-Oriented database.

UNIT I - OVERVIEW **(9)**

PL/SQL – Introduction to PL/SQL – Declare, begin statements, Variables, Control Structure, PL/SQL Transactions – Savepoint, Cursor, PL/SQL Database Objects – Procedures, Functions, Packages, Triggers. Programmatic SQL – Embedded SQL, Dynamic SQL, and ODBC Standard

UNIT II - TRANSACTION PROCESSING AND CONCURRENCY CONTROL **(9)**

Definition of Transaction and ACID properties. Transaction Processing - Transaction-processing monitors, transactional workflows, main-memory databases, real-time transaction systems, long-duration transactions, transaction management in multi-databases. Concurrency Control – Locks, Optimistic Concurrency Control (Backward and Forward validations), Timestamping Concurrency Control.

UNIT III - DATABASE SECURITY **(9)**

Security and integrity threats, Defence mechanisms, Statistical database auditing & control. Security issue based on granting/revoking of privileges, Introduction to statistical database security. PL/SQL Security – Locks – Implicit locking, types and levels of locks, explicit locking, Oracles' named Exception Handlers.

UNIT IV - COMPLEX QUERIES **(9)**

Logic of Query Languages – Relational Calculi – Recursive rules – Syntax and semantics of Data log – Fix point semantics – Implementation Rules and Recursion – Rule rewriting methods – Compilation and Optimization – Recursive Queries in SQL – Open issues.

UNITV - SPATIAL,TEXT AND MULTIMEDIA DATABASE **(9)**

Traditional Indexing Methods (Secondary Keys, Spatial Access Methods) – Text Retrieval – Multimedia Indexing – 1D Time Series – 2d Color images – Sub pattern Matching – Open Issues – Uncertainties.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Abraham Silberschatz, Henry F.Korth, S.Sudharshan,"Database System Concepts" Sixth Edition, 2010.

REFERENCE:

1. Raghu Ramakrishnan “Database Management System”, Mc Graw Hill Publications, 2014.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1				x								x
2												x
3			x								x	x
4					x		x	x		x		
5				x		x				x	x	

15ITX04 - RELATIONAL DATABASE MANAGEMENT SYSTEM USING DB2

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the advanced concepts of DBMS
- To understand the demand of Big Data in IT
- To implement DB2 in client-server architecture in secured manner.

COURSE OUTCOMES:

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

CO1 : Understand, analyze and evaluate a mainframe system using DB2 concepts.
CO2 : Administer DB2 in a mainframe computer.
CO3 : Ensure the security of databases.
CO4 : Install various types of DB2 Tools.
CO5 : Manage the storage model of DB2.

UNIT I - INTRODUCTION TO DB2 (9)

A Brief History of DB2 – The Role of DB2 in the Information on Demand World – DB2 Clients – DB2 at a Glance : SQL Statements, XQuery Statements, and DB2 Commands – The DB2 Environment – Database Partitioning Feature - Database Federation – Case Study : The DB2 Environment, DB2 with DPF Environment.

UNIT II - INSTALLING DB2 TOOLS (9)

DB2 Installation: Installing DB2 Using the DB2 Setup Wizard - Root and Non-Root Installation on Linux and UNIX - Required User IDs and Groups - Advanced DB2 Installation Methods - Installing DB2 in a DPF Environment - Migrating DB2 - DB2 Tools: The Command-Line Tools - Web-Based Tools - General Administration Tools - Information Tools - Monitoring Tools - Setup Tools – Case study.

UNIT III - CLIENT AND SERVER CONNECTIVITY (9)

Client and Server Connectivity: The DB2 Database Directories - Supported Connectivity Scenarios - Configuring Database Connections Using the Configuration Assistant - Diagnosing DB2 Connectivity Problems - The DB2 Environment – The DB2 Instance - The Database Administration Server - Configuring a Database - Instance and Database Design Considerations - Case study.

UNIT IV - DB2 STORAGE MODEL (9)

Databases: Logical and Physical Storage of Your Data - Database Partition Groups - Table Spaces - Buffer Pools - DB2 Database Objects: Data Types – Tables – Indexes - Multidimensional Clustering Tables and Block Indexes – Views – Packages – Triggers - Stored Procedures - User-Defined Functions – Sequences - Case study.

UNITV - IMPLEMENTING SECURITY (9)

DB2 Security Model: Authentication - Data Encryption - Administrative Authorities - Database Object Privileges - Label-Based Access Control - Authority and Privilege Metadata - Windows Domain Considerations - Trusted Contexts Security Enhancement - DB2 Locking and Concurrency: Concurrency and Locking Scenarios - DB2 Isolation Levels - DB2 Locking - Diagnosing Lock Problems - Techniques to Avoid Locking – Case Study

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. DB2 Essentials – IBM - Roland Barcia, Bill Hines, Tom Alcott, and Keys Botzum – Third Edition (2014).
2. Understanding DB2 Learning Visually with Examples - Raul F. Chong, Xiaomei Wang, Michael Dang, Dwaine R. Snow- IBM Press - Second Edition (2008).

REFERENCES :

1. Beginning DB2: From Novice to Professional A press; 2008 edition (21 August 2008) , by Grant Allen .
2. DB2 Database Concepts-Prentice-hall Of India Pvt Ltd (2005) by I. B. M.
3. DB2: The Complete Reference Tata McGraw Hill Education (2002) by Paul Zikopoulos (Author), IBM (Author), Roman .

Mapping of Course Outcome and Programme Outcomes

Mapping of COs and POs												
Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x				x	x	x	x
2	x	x		x	x		x			x	x	x
3	x	x				x				x	x	x
4		x	x		x			x		x	x	x
5	x		x	x		x				x		x

Approved by Sixth Academic Council

15CS511 - CASE TOOLS LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVE:

- To have a knowledge on problem analyzing.
- To learn how to identify objects and their relationships.
- To get familiarized on object oriented design process.
- To know the project module development using tools.
- To gain experience on writing test cases.

COURSE OUTCOMES:

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

CO1 : Outline the Project Scope And Objectives.
CO2 : Write the Software Requirement Analysis.
CO3 : Create Data Modelling.
CO4 : Develop and Debug the Projects.
CO5 : Generate Test Cases using Testing Strategies.

Prepare the following documents for the project and develop the software using software engineering methodology.

1. Problem Analysis and Project Planning - study of the problem, Identify project scope, Objectives, and infrastructure
2. Software Requirement Analysis - Phases/ modules of the project, Identify deliverables.
3. Data Modeling - use work products, data dictionary and UML diagrams.
4. Software Development and Debugging.
5. Software Testing - Prepare test plan, perform validation testing, coverage analysis, memory leaks, develop test case hierarchy, Site check and site monitor.

SAMPLE PROJECTS:

1. EB Bill Management Systems
2. ATM system
3. Attendance management system
4. Courier information systems
5. Student marks analyzing system
6. Passport automation system
7. Online course registration system
8. Examination result system
9. Library management system
10. Payroll system

Software Required:

Case Tools : Rational Suite, Win runner, Empirix, Pencil Tool
Languages : C/C++/JDK 1.3,JSDK, INTERNET EXPLORER, UML
Front End : VB, VC++, Developer 2000
Back End : Oracle, MS-Access, SQL

TOTAL (P:60) = 60 PERIODS

Approved by Sixth Academic Council

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	X	x	x						x		x	x
2	X	x			x				x		x	x
3	X	x	x		x						x	x
4	X	x	x	x	x		x		x		x	x
5	X	x			x		x		x		x	x

Approved by Sixth Academic Council

15ITW01 – OBJECT ORIENTED DATABASE MANAGEMENT SYSTEM LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES:

- To acquire the knowledge of Database systems that allows the students to build a strong foundation to design Query languages and managing spatial data.

COURSE OUTCOMES:

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

CO1 : Apply basic concepts of Spatial databases.
CO2 : Analyze relational model of data import and export.
CO3 : Evaluate Extended Entity Relationship.
CO4 : Understand the relation between Data mining Techniques.
CO5 : Acquire knowledge about Database access.

LIST OF EXPERIMENTS:

1. Managing spatial data
2. Object Query Language
3. Embedded Object Query Language
4. Data Import and Export
5. Backup configuration
6. Object Oriented Database – Extended Entity Relationship(EER)
7. Functions , Stored Procedures, Triggers
8. Normalization Techniques
9. Data Mining and Data warehouse
10. Database access using API

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x						x		x	x
2							X					
3										x	x	
4				x		x			x			
5			x		x				x		x	

Approved by Sixth Academic Council

15ITW02 - DATA SCIENCE AND BIG DATA ANALYTICS LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES:

- To present the basic techniques for extracting information from large datasets such as the web, social-network graphs, and large document repositories.
- To introduce to the students with the theoretical and practical tools and techniques for data mining of massive datasets through practical applications in predictive analytics.
- To help the students familiarize with the modern data science toolkits and platforms and the "big data" ecosystems.

COURSE OUTCOMES:

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

CO1 : Possess the skills necessary for utilizing tools.
CO2 : Deploying them on Hadoop /MapReduce.
CO3 : Handle a variety of big data analytics.
CO4 : Apply the analytics techniques on a variety of applications.
CO5 : Design, implement, populate and query data ware houses for informational data.

LIST OF EXPERIMENTS:

1. Program using Control Structures.
2. Program using List, Vectors and Factors.
3. Program using Matrix.
4. Program to implement Function.
5. Program to exploring different plots.
6. Program to implement K-means clustering.
7. Program to implement Association rules.
8. Program to implement logistic Regression.
9. Program to implement linear Regression.
10. Program to implement classification – Decision tree/Naïve bayes.

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x					x	x		x
2								x				
3											x	x
4					x		X	x		x		
5				x		x				x		x

15ITW03 – ADVANCED DATABASE MANAGEMENT SYSTEM LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES:

- To learn to work on distributed data bases& object oriented databases.
- To gain knowledge in parallel data base by experimenting it
- To study and explore deductive database.
- To work on the data mining tool weka.
- To represent and work with the database using XML.

COURSE OUTCOMES:

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

CO1 : Understand the basic terminology of distributed database.
CO2 : Use different basic concepts of advanced database.
CO3 : Design deadlock detection and its terminologies.
CO4 :Solve various data mining concepts in weka tool.
CO5 : Develop XML schemas for various Databases.

LIST OF EXPERIMENTS:

1. Consider a distributed database for a bookstore with 4 sites called S1, S2, S3 and S4.and implement sample relations.
2. Implement deadlock detection algorithm for distributed database using wait-for graph and test with sample transaction.
3. Perform locking systems in transaction processing using sample databases.
4. Perform OQL & EOQL for sample relations
5. Spatial Database management.
6. Create triggers for bank database.
7. Construct a knowledge database for kinship domain (family relations) with facts. Extract the following relations using rules. Parent, Sibling, Brother, Sister, Child, Daughter, Son, Spouse, Wife, husband, Grandparent, Grandchild, Cousin, Aunt and Uncle.
8. Work with Weka tool classification and clustering algorithms using the given training data and test with the unknown sample. Also experiment with different scenarios and large data set
9. Implement Query Optimizer with Relational Algebraic expression for employee database.
10. Design XML Schema for sample company database

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1			x	x	x	x	x			x		x
2		x					x				x	x
3			x	x	x					x		x
4											x	x
5	x		x		x		x			x		

Approved by Sixth Academic Council

15ITW04 – RELATIONAL DATABASE MANAGEMENT SYSTEM USING DB2 LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES:

- This laboratory course gives a thorough understanding of the concepts of DB2. It also gives a comprehensive understanding of using a query language.

COURSE OUTCOMES:

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

CO1 : Populate and query a database using SQL DML/DDL commands.
CO2 : Declare and enforce integrity constraints on a database using a RDBMS .
CO3 : Programming PL/SQL including stored procedures, stored functions, cursors.
CO4 : Develop a package using database connectivity.
CO5 : Design of different object and row locking technologies.

LIST OF EXPERIMENTS:

1. DDL & DML – data types, create, alter, drop table, integrity constraints.
2. Insert, delete and update commands.
3. DCL & TCL – Grant, revoke, rollback and commit.
4. Select command with operators like arithmetic, comparison, logical, order by, group by etc.
5. Set operations.
6. Join query concept.
7. Complex and sub queries.
8. Database objects – view, index, sequence – create, alter and drop.
9. Record management using cursors.
10. Function – definition and implementation.
11. Database triggers.
12. Develop a package using database connectivity.
13. Creating a database and table for storing XML data.
14. Object and Row Locking.

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x	x	x	x			x		x
2	x	x			x		x				x	x
3	x		x	x	x		x			x	x	x
4	x										x	x
5	x		x		x		x			x		

15GY511 – SOFT SKILLS APTITUDE AND REASONING – I

(Common to All Branches)

L	T	P	C
0	0	2	0

OBJECTIVE:

- To enhance the students to write and speak fluently with the help of grammatical structures
- To develop students to workout solution for problems that involves mathematical aptitude
- To develop students to workout solutions for problems that involves general reasoning

COURSE OUTCOMES:

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

CO1 : Write and speak fluently without any grammatical errors

CO2 : Solve aptitude problems with ease

CO3 : Solve reasoning problems with ease

UNIT I SOFT SKILLS **(10)**

Grammar –Parts of Speech, Tenses, Subject - Verb agreement , Articles, Preposition, Conjunctions, Modal Auxiliaries, Degrees of Comparison – Self Introduction - Role Play - Object Description – Passage writing

UNIT II APTITUDE **(10)**

Average - Percentage - Age Ratio & Proportion - Partnership - Profit & loss - Mixture & Allegation

UNIT III REASONING **(10)**

Odd man out - Number Series - Syllogism - Coding & decoding - Seating arrangement.

TOTAL (L:30) = 30 PERIODS

TEXT BOOKS:

1. Thorpe, Edgar and Shawick Thorpe,*Objective English* 3rd ed. New Delhi: Pearson, 2011 Print.
2. Khattar, Dinesh, *Quantitative Aptitude*, 3rd ed. New Delhi: Pearson, 2014 Print.

REFERENCES:

1. Prasad, Hari Mohan & Uma Rani Sinha, Objective English for Competitive Examinations, 4th ed. New Delhi: Tata McGraw Hill Education Pvt.Ltd., 2010 Print.
2. Aggarwal R.S., A Modern Approach to Verbal & Non Verbal Reasoning, Revised Edition, New Delhi: S.Chand Publishers, 2017 Print.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1							x	x	x	x		x
2												x
3							x	x				x

SEMESTER VI

15IT601– COMPILER DESIGN

L	T	P	C
3	0	0	3

OBJECTIVES :

- To introduce the major concept areas of language translation and compiler design.
- To enrich the knowledge in various phases of compiler ant its use, code optimization techniques, machine code generation, and use of symbol table.

COURSE OUTCOMES:

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

CO1 : Apply the knowledge of lex tool &yacc tool to develop a scanner & parser.

CO2 : Design experiments for Intermediate Code Generation in compiler.

CO3 : Design a software system for backend of the compiler.

CO4 : Learn how to optimize and effectively generate machine codes.

CO5 : Analyze the storage allocation strategies in run time environment.

UNIT I - INTRODUCTION TO COMPILING (9)

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT II - SYNTAX ANALYSIS (9)

Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser.

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 code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT V - CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS (9)

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Alfred V. Aho, Ravi Sethi & Jeffrey. D. Ullman, “Compilers Principles, Techniques &Tools”, Pearson Education, third edition, 2007.
2. D.M.Dhamdhere, "System Programming and Operating Systems", 2nd Edition., Tata Mcgraw Hill,1995

REFERENCES:

1. Allen I.Holub “compiler Design in C”,Prentice Hall of India,2003.
2. J.P.Bennet, ”Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill,2003.

Mapping of Course Outcome and Programme Outcome

Mapping of Cos and Pos												
Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x	x	x	x			x		x
2			x	x	x			x				x
3		x	x		x		x					x
4			x		x	x			x	x	x	x
5	x			x	x		x				x	x

15ITC02 - INTERNET OF THINGS – ENABLING TECHNOLOGY

L	T	P	C
3	0	0	3

OBJECTIVE:

- To learn the basic issues, policy and challenges in the Internet
- To understand the components and the protocols in Internet
- To build a small low cost embedded system with the internet
- To understand the various modes of communications with Internet.
- To learn to manage the resources in the Internet.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1 : Understand the basic concepts of IoT.
CO2 : Program the sensors and controller as part of IoT.
CO3 : Design a portable IoT using appropriate boards.
CO4 : Develop schemes for the applications of IoT in real time scenarios .
CO5 : Establish a knowledge on security in IoT.

UNIT I - : Introduction to IoT **(9)**

Definition of IoT - Evolution of IoT - IoT and related terms – Key Drivers of IoT Discipline – The Diversity of IoT data sources – Connected Devices – Popular M2M applications – Emerging IoT Flavors.

UNIT II - Elements and IoT Gateways **(9)**

Introduction to Elements of IoT - Basic Architecture of an IoT Application-Sensors & Actuators - Gateways - IoT Communication Model – 6LoWPAN - LPWAN – Sigfox - LoRa – Mobile Technologies for IoT.

UNIT III - Computing and Connecting Technologies **(9)**

Cloud Computing in IoT – Introduction of Fog/Edge Computing – Fog versus Edge Computing – Use Cases of Fog/Edge computing - IoT Communication protocol requirements – Layered architecture of IoT - Cloud Connectivity – BLE, ZigBee , Z-Wave.

UNIT IV - Data Analytics and IoT Platforms **(9)**

Big Data Analytics - Real Time and Streaming Analytics – Key Drivers for IoT Data analytics – Emergence of Edge Clouds – Renowned Edge Analytics Use Cases - Data Visualization Platform – Modules of IoT Data Analytics Platform – Renowned Use Cases for IoT Data Analytics.

UNIT V - Concerns and Future Trends **(9)**

Security Requirements of an IoT Infrastructure – AAA Framework – Security concerns of Cloud Platforms – Security concerns in IoT components - Future Trends – Standards – Smart Uses Cases of IoT.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK :

1. Pethuru Raj and Anupama C.Raman, “The Internet of Things – Enabling Technologies, Platforms and Use Cases”, CRC Press, 2017.

REFERENCE:

1. Kevin Loney, Bob Bryla, “Oracle Database DBA Handbook”, Tata McGraw Hill Edition, Tata McGraw Hill Publication, 2005.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x								x			x
2	x	x	x								x	x
3	x	x		x		x			x			x
4	x	x	x	x	x				x		x	x
5	x	x	x	x	x				x		x	x

15IT602 - C# and .NET

L	T	P	C
3	0	2	4

OBJECTIVE:

- To understand the fundamental concepts of the C# language and the .NET framework.

COURSE OUTCOMES:

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

CO1 : List the major elements of the .NET frame work.
CO2 : Explain how C# fits into the .NET platform.
CO3 : Analyze the basic structure of a C# application.
CO4 : Debug, compile, and run a simple application.
CO5 : Develop programs using C# on .NET.

UNIT I - INTRODUCTION TO C# **(9)**

Introducing C#, Understanding.NET, Overview of C#, Literals, Variables, DataTypes, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT II - OBJECTORIENTED ASPECTS OF C# **(9)**

Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

UNIT III -APPLICATION DEVELOPMENT ON .NET **(9)**

Building Windows Applications, Accessing Data withADO.NET.

UNIT IV - WEB BASED APPLICATION DEVELOPMENT ON .NET **(9)**

Programming Web Applications with Web Forms, Programming Web Services.

UNIT V - THE CLR ANDTHE.NETFRAMEWORK **(9)**

Assemblies, Versioning, Attributes, Reflection, Viewing Meta Data, Type Discovery, Reflecting on a Type, Marshaling, Remoting , Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using Single Call, Threads.

LIST OF EXPERIMENTS:

1. To write a C# program using Branching and Looping statements.
2. To write a C# program using Arrays.
3. To write a C# program using Structures.
4. To write a C# program using inheritance concepts.
5. To write a C# program using Polymorphism.
6. To write a C# program using interfaces.
7. To write a C# program by using operator overloading.
8. To write a C# program using delegates and events.
9. To write a C# program for connect a database using ADO.NET on employees.
10. To write a C# program for connect a database using ADO.NET on student database

TOTAL (L:45,P:30) = 75 PERIODS

TEXT BOOK:

1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2015.

REFERENCES :

1. J. Liberty, "Programming C#", 2nd ed., O'Reilly, 2002.
2. Herbert Schildt,"The Complete Reference : C#", Tata Mc Graw-Hill, 2004.
3. Robinson etal,"Professional C#", 2nd Ed., Wrong Press, 2002.
4. S. Thamarai Selvi, R. Murugesan, "A Textbook on C#", Pearson Education, 2003.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x					x			x			
2	x								x			
3	x									x		
4	x			x		x			x			
5	x					x			x			

Approved by Sixth Academic Council

15IT603 – CRYPTOGRAPHY AND NETWORK SECURITY

L	T	P	C
3	0	0	3

OBJECTIVE:

- To be familiar with cryptographic techniques for secure (confidential) communication of two parties over an insecure (public) channel; verification of the authenticity of the source of a message; secure connection between public and private networks.

COURSE OUTCOMES:

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

CO1 : Understand the requirement and concepts of security system.
CO2 : Analyze a given system with respect to security concepts.
CO3 : Create an understanding of Data Integrity Algorithms, Design and issues of Authentication services.
CO4 : Understand the Key Management and distribution methods.
CO5 : Understand security models in different networks and system security.

UNIT I - COMPUTER SECURITY BASICS (9)

Computer Security Concepts, OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, Model for Network Security, Classical Encryption techniques- Substitution and Transposition methods, Block Cipher Principles.

UNIT II - ENCRYPTION STANDARDS AND BLOCK CIPHER OPERATION (9)

Data Encryption Standard- DES Encryption- Initial Permutation- Details of Single Round- Key Generation- DES Decryption, Advanced Encryption Standard (AES)- General Structure-Detailed Structure, AES Transformation Functions, Multiple Encryption and Triple DES- Double DES-Triple DES with Two Keys- Triple DES with Three Keys, Block Cipher Operation- Electronic Code Book- Cipher Block Chaining Mode- Cipher Feedback Mode-Output Feedback Mode- Counter Mode.

UNIT III - PUBLIC-KEY CRYPTOSYSTEMS AND DATA INTEGRITY (9)

RSA Algorithm-Description of the Algorithm-Computational Aspects, Diffie-Hellman Key Exchange Algorithm, Applications of Cryptographic Hash Functions, Message Authentication Code- Requirements-Functions- Security, MACs Based on Hash Functions (HMAC), MACs Based on Block Ciphers- Data Authentication Algorithm (DAA) – Cipher-based Message Authentication Code(CMAC) , Digital Signatures –Properties - Attacks and Forgeries - Requirements - Direct Digital Signature, Digital Signature Standard.

UNIT IV - MUTUAL TRUST (8)

Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key Distribution Using Asymmetric Encryption, Distribution of Public Keys- Public Announcement of Public Keys -Publicly Available Directory - Public-Key Authority - Public-Key Certificates, Remote User-Authentication Principles, Remote User-Authentication Using Symmetric Encryption, Kerberos, Remote User Authentication Using Asymmetric Encryption.

UNIT V - NETWORK AND SYSTEM SECURITY (10)

Wireless Network Security- Wireless LAN Overview - Wireless LAN Security- Wireless Transport Layer Security- WAP End-to-End Security, E-mail Security – Pretty Good Privacy – Secure/Multipurpose Internet Mail Extension (S/MIME), IP Security- Overview – Policy – Combining Security Associations, Malicious Software – Types – Viruses – Virus Countermeasures – Worms, Firewalls – Characteristics – Types – Basing – Location and Configurations.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. William Stallings, "Cryptography and Network Security – Principles and practice", 6th Edition Pearson Education, 2013.

REFERENCES:

1. Mark Rhodes-Ousley, “Information Security- The Complete Reference”, 2nd Edition, McGraw-Hill, 2013.
2. B. A. Forouzan, "Cryptography and Network Security", 2nd Edition, McGraw Hill, 2010.
3. Johannes A Buchmann, “Introduction to Cryptography”, 2nd ed., Spiringer–verlag, 2004.
4. Mano W, “Modern Cryptography: Theory & Practice”, Pearson Education, 2004.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x					x		x	
2		x		x	x						x	
3	x		x				x					
4		x	x					x		x		x
5		x	x			x		x			x	x

15IT701 - SOFTWARE TESTING

L	T	P	C
3	0	0	3

OBJECTIVES :

- To study the fundamentals of software testing.
- To provide a complete, comprehensive coverage of various software testing methods.
- To develop test cases using manual testing and to enable the learner to become a Software Tester.

COURSE OUTCOMES:

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

CO1: Understand the Software Testing Concepts.

CO2: Learn the working of manual testing.

CO3: Design the test cases and to getting familiarity over testing tools.

CO4: Use the techniques, skills and modern software testing tools necessary for testing.

CO5: Use the testing tools to check the behaviour of the real time application.

UNIT I INTRODUCTION TO QUALITY AND SOFTWARE QUALITY (9)

Introduction- Software Development Life Cycle (SDLC)-Historical Perspective of Quality-Definition of Quality-Total Quality Management-Continuous Improvement Cycle-Constraints of Software Quality Assessment-Customer is a King-Software Quality Management-Why software has defects?-Important Aspects of Quality Management-Types of Products-Quality Management System Structure-Pillars of Quality Management System

UNIT II FUNDAMENTALS OF SOFTWARE TESTING (9)

Definition of Testing-Approaches to Testing-Popular Definitions of Testing-Testing during Development Life Cycle-Requirements Traceability Matrix-Essentials of Software Testing-Workbench-Important Features of Testing Process-Test Planning-Test Team Approach-Testing Process- Black Box Testing-White Box Testing.

UNIT III MANAGEMENT CONCEPTS AND TESTING TECHNIQUES (9)

Configuration Management-Configurable Items-Base lining-Configuration Management Planning-Types of Software Risks-Handling of Risks in Testing- Unit Testing- Integration Testing – System Testing – User Acceptance Testing - SRS – Use case Design-Test Case Design-Bug Report Preparation

UNIT IV FUNCTIONALITY TOOL (9)

Introduction to Silk Test-Silk Test Architecture-Automated Testing Process-Quick start with Silk Test-Configuring the settings-Exposure to Silk Test IDE-Plug and Play test case.

UNIT V TEST MANAGEMENT TOOL (9)

Introduction-Testing Process-Specifying Testing Requirements-Planning Tests-Calling Tests with Parameters-Creating and Viewing Requirements Coverage-Generating Automated Test Scripts-Running Tests-Defining Test Sets

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOKS:

1. M.G.Limaye , Software Testing, Tata McGraw-Hill, 2014.
2. R.S. Pressman, “Software Engineering, a practitioner “approach,” 7th edition, McGraw Hill 2010.

REFERENCES:

1. Dr. K.V.K.K Prasad , Software Testing Tools, Dreamtech 2004.
2. URL: www.onestoptesting.com/SilkTest
3. URL: www.onestoptesting.com/testdirector

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x			x		x				x
2	x							x				
3			x					x				x
4	x							x				
5	x		x					x				x

15IT711 - SOFTWARE TESTING LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES :

- To get the knowledge on the fundamentals of software testing tools.
- To get practical knowledge and comprehensive coverage of various software testing methods. To develop test cases and to enable the learner to become a Software Tester.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to
CO1: Demonstrate knowledge of Software Testing concepts in the projects.
CO2: Learn the various software testing tools.
CO3: Design the test cases for the software project
CO4: Use the techniques, skills and modern software testing tools necessary for testing.
CO5: Use the testing tools to check the behavior of the real time application

LIST OF EXPERIMENTS:

1. Develop a SRS for any one application.
2. Draw the design for any one application.(Data Flow Diagram)
3. Test Plan Preparation of window based and web based application.
4. Create a use case design of any application
5. Test case design of any application
6. Bug Report design of any application
7. Testing with Test Director Tool.
8. Testing with Silk Test.
9. Regression Testing and Scripting with Silk Test.
10. Scripting using Junit Tool.

TOTAL: 60 PERIODS

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x			x		x				x
2	x							x				
3			x					x				x
4	x							x				
5	x		x					x				x

15IT731PROJECT WORK I

L	T	P	C
0	0	8	4

COURSE OBJECTIVE:

- To identify the problem in the specific domain or enhance the existing product to the next level.
- To learn how to formulate solution for the problem.
- To be trained to function effectively as an individual and a member in diverse teams.
- To interpret and justify the experimental results
- To develop an effective communication and be trained to write dissertation report

COURSE OUTCOMES:

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

CO1 Demonstrate a sound technical knowledge of their selected project topic.
CO2 Undertake problem formulation and solution legally for the sustainable development.
CO3 Develop an attitude of team work and independent working on real time problems.
CO4 Design engineering solutions to complex problems based on engineering and management principles.
CO5 Communicate with engineers and the community at large in written and oral forms.

THE PROJECT INVOLVES THE FOLLOWING

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. Either second or third review is evaluated by an industry expert. Finally, prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners.

PROJECT WORK WILL BE EVALUATED BY CONTINUOUS ASSESSMENT AND END SEMESTER ASSESSMENT

Continuous Assessment - 50 Marks					**End Semester Assessment - 50 Marks**	
	Guide	Committee	Total		Internal Examiner	40
0thReview	10	10	20		External Examiner	40
1stReview	20	20	40		Report	20
2nd Review	20	20	40		Total	100
Total			100			

TOTAL (P:120) = 120 PERIODS

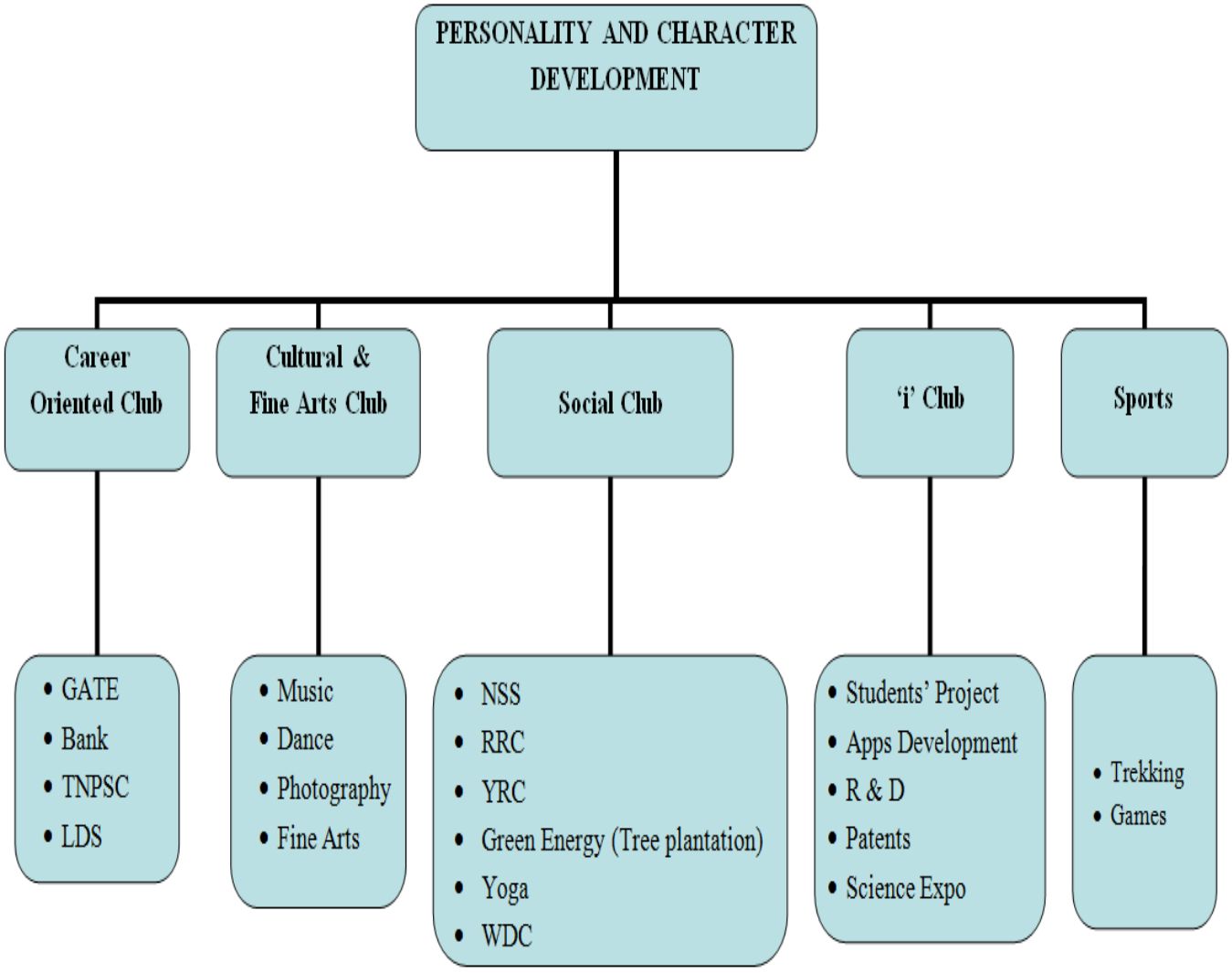
Approved by Sixth Academic Council

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x										x
2			x	x	x		x	x				
3								x	x			
4			x	x	x						x	
5						x				x		

15GE711 PERSONALITY AND CHARACTER DEVELOPMENT

L	T	P	C
0	0	1	0



***LDS - Leadership Development Skills**

OBJECTIVES :				
Career Oriented Club	**Cultural & Fine Arts Club**	**Social Club**	**'i' club**	**Sports**
• To provide support for identifying specific career field of interests and career path • To provide support for preparing for competitive exams	• To bring out the hidden talent of students in music, dance and other fine arts. • To promote photography skill among the students • To develop and enhance the performance of students by participating in various events • To inculcate managerial capabilities such as event management and stage organization	• To create social awareness and develop a sense of social and civic responsibility • To inculcate socially and environmentally sound practices and be aware of the benefits • To encourage the students to work along with the people in rural areas, thereby developing their character, social consciousness, commitment, discipline and being helpful towards the community.	• To inculcate the basic concepts of innovation • To foster the networking between students, build teams, exchange ideas, do projects and discuss entrepreneurial opportunities • To enrich the academic experience, build competencies and relationships beyond the classroom	• To provide opportunities to excel at sports • To promote an understanding of physical and mental well-being through an appreciation of stress, rest and relaxation. • To develop an ability to observe, analyze and judge the performance of self and peers in sporting activities. • To develop leadership skills and nurture the team building qualities. **Trekking:** • To provide opportunities to explore nature and educating about the purity of nature • To improve physical and mental health.

OUTCOMES : At the end of this course, the students will be able to				
• Find a better career of their interest. • Make use of their knowledge during competitive exams and interviews.	• Take part in various events • Develop team spirit, leadership and managerial qualities	• Develop socially responsive qualities by applying acquired knowledge • Build character, social consciousness, commitment and discipline	• Apply the acquired knowledge in creating better solutions that meet new requirements and market needs • Develop skills on transforming new knowledge or new technology into viable products and services on commercial markets as a team	• Demonstrate positive leadership skills that contribute to the organizational effectiveness • Take part an active role in their personal wellness (emotional, physical, and spiritual) that supports a healthy lifestyle • Create inclination towards outdoor activity like nature study and Adventure.

TOTAL [4 x (P: 15)]: 60 PERIODS

(Cumulatively for Four Semesters)

15IT831 PROJECT WORK II

L	T	P	C
0	0	16	8

COURSE OBJECTIVE:

- To identify the problem in the specific domain or enhance the existing product to the next level.
- To learn how to formulate solution for the problem.
- To be trained to function effectively as an individual and a member in diverse teams.
- To interpret and justify the experimental results
- To develop an effective communication and be trained to write dissertation report

COURSE OUTCOMES:

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

CO1 Demonstrate a sound technical knowledge of their selected project topic.
CO2 Undertake problem formulation and solution legally for the sustainable development.
CO3 Develop an attitude of team work and independent working on real time problems.
CO4 Design engineering solutions to complex problems based on engineering and management principles.
CO5 Communicate with engineers and the community at large in written and oral forms.

THE PROJECT INVOLVES THE FOLLOWING

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. Either second or third review is evaluated by an industry expert. Finally, prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners.

PROJECT WORK WILL BE EVALUATED BY CONTINUOUS ASSESSMENT AND END SEMESTER ASSESSMENT

Continuous Assessment - 50 Marks					End Semester Assessment - 50 Marks	
	Guide	Committee	Total		Internal Examiner	40
0thReview	10	10	20		External Examiner	40
1stReview	20	20	40		Report	20
2nd Review	20	20	40		Total	100

TOTAL (P: 240) = 240 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x										x
2			x	x	x		x	x				
3								x	x			
4			x	x	x						x	
5						x				x		

15ITX05 - PROGRAMMING WITH PHP

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand the fundamental concepts in PHP.
- To understand the advanced concepts of PHP.
- To learn PHP with MySQL.

COURSE OUTCOMES:

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

CO1: Understanding the basics of PHP.
CO2: Understanding the concepts of Control flows, Strings, Arrays and Functions.
CO3: Understanding the OOP concepts with PHP.
CO4: Handling forms in PHP and advanced PHP.
CO5: Understanding MySQL with PHP.

UNIT I – INTRODUCTION **(9)**

Features- Basic development concepts- Creating a first PHP script- Comments to PHP code- Working and storing data in variables- Constants- PHP internal data types- Manipulating variables with operators.

UNIT II - FLOW CONTROLS, STRINGS, ARRAYS AND FUNCTIONS **(9)**

Flow controls: If, If else, Switch, For, While, Do While, For each- Working with strings functions-Storing Data in arrays- Processing arrays with loops and iterators- Working with array functions- Creating user defined functions- Working with Dates and Times- MVC framework architecture overview.

UNIT III - OBJECT ORIENTED PROGRAMMING **(9)**

Classes and Objects- Constructors - Inheritance- Overriding- Overloading- Creating static methods-Abstract classes- Interfaces- Final keyword- Magic functions.

UNIT IV - PHP FORMS AND ADVANCED PHP **(9)**

PHP Form handling- Form validations: PHP Form validations, HTML5 Form validations, JavaScript Form validations, JQuery Form validations- Case study: Create a sample user registration form with validations- File handling functions: File Open/Read- File Create/Write- File Upload- PHP Error handling- Working with Cookies- Working with Sessions- PHP Include.

UNIT V - MySQL WITH PHP **(9)**

Database- Essential SQL- Creating MySQL Database- Creating a new table- Putting data into the database- Accessing the database- Updating database- Deleting records- MySQLi overview.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS :

1. VikramVaswani, “PHP: A BEGINNERS GUIDE”, TATA Mc GRAW-HILL Edition, 2009.
2. Steven Holzner, “PHP: The Complete Reference”, TATA Mc GRAW-HILL Edition. 2009.

REFERENCES :

1. Joel Murach, Ray Harris “Murach‟s PHP and MySQL”, 2nd edition.
2. Lynn Beighley, Michael Morrison “Head First PHP and MySQL.
3. URL: www.w3schools.com/php/

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x						x		
2												
3			x				x					
4												
5				x		x				x		

15ITX06 - PROGRAMMING WITH PYTHON

L	T	P	C
3	0	0	3

OBJECTIVES :

- Ability to analyses and synthesis.
- Ability to solve problem using Python.
- Ability to create software using python.

COURSE OUTCOMES:

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

CO1: Execute Python code in a variety of environments.
CO2: Use the correct Python control flow construct.
CO3: Understand the Python functions and variables.
CO4: Trap various errors via the Python Exception Handling model.
CO5: Create their own classes and use existing Python classes.

UNIT I - INTRODUCTION ANDENVIRONMENT (9)

History of Python, Python Features, Installing Python, Environment, Python, Basic Syntax-First python Program-identifiers-keywords-multiline statements-Comment line arguments, Variables-Assigning Values to Variables-Multiple Assignment-Standard Data Types.

UNIT II - LANGUAGE COMPONENTS&COLLECTIONS (9)

Basics Operators, Decision Making, Loops, Numbers-Number Type Conversion-Random Number Functions-MathematicalConstants,Strings-AccessingValuesinStrings-StringSpecialOperators- String Formatting Operator- Triple Quotes- Unicode String- Built-in String Methods, LISTS- Accessing Values in Lists-Updating Lists-Deleting List Elements-Basic List Operations-Built-in List Functions and Methods, Tuples- Accessing Values in Tuples– Updating Tuples-Deleting Tuple Elements- Tuples Operations-Tuple Functions.

UNIT III - FUNCTIONS & MODULES (9)

Functions- Defining a Function- Calling a Function- Passing by Reference Versus Passing by Value- Function Arguments-Scope of Variables – Global vs .Local variables, Modules- The import Statement- The from... import Statement- The from import Statement- Locating Modules- The Python Path Variable- Namespaces and Scoping- The dir( ) Function-The globals() and locals() Functions-The reload() Function-Packages in Python

UNIT IV – EXCEPTION & FILES I/O (9)

Files I/O-Reading Keyboard Input- The raw input Function- Opening and Closing Files- The open Function- The close() Method- The write() Method- Thread () Method- Renaming and Deleting Files- Directories in Python, Exception- Handling an Exception- The except Clause- The try-finally Clause- Argument of an Exception- Raising an Exception-User-Defined Exceptions.

UNIT V - CLASSES AND OBJECTS & REGULAR EXPRESSIONS (9)

Overview of OOP Terminology – Creating Classes – Creating Instance Objects- Accessing Attributes- Built-In Class Attributes- Destroying Objects (Garbage Collection)-Class Inheritance- Overriding Methods- Overloading Methods-Overloading Operators, Regular Expressions: The match Function- The search Function- Matching Versus Searching-Regular - Expression - Patterns– Grouping with Parentheses- Back references.

TOTAL (L:45) = 45 PERIODS

TEXTBOOKS:

1. Martin C. Brown, “PYTHON :The Complete Reference”, McGraw Hill, 2001.
2. David M. Beazely, “Python Essential Reference”, 4th Edition 2009.

REFERENCES:

1. PYTHON Programming Language, Copyright 2014 by Tutorials Point (I) Pvt. Ltd.
2. Naomi R. Ceder, The Quick Python Book, Second Edition, 2010.
3. Paul Barry, Head First Python Paperback–Import, 2010.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x						x		x
2											x	
3			x				x			x	x	
4						x					x	x
5				x		x				x		

Approved by Sixth Academic Council

15ITX07 - PROGRAMMING WITH JAVA 2 ENTERPRISE EDITION

L	T	P	C
3	0	0	3

OBJECTIVES :

- To acquire knowledge on the usage of recent platforms in developing web applications.
- To understand architecture of J2EE and design applications using J2EE.
- To design and develop interactive, client-side, server-side executable web applications.

COURSE OUTCOMES:

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

CO1: Understand the basics of design and implementation of java programming language.
CO2: Understand functionality of Internet system.
CO3: Design a system according to customer needs using the available Internet technologies.
CO4: Design and develop interactive, client-side, server-side executable web applications.
CO5: Explore the features of various platforms and frameworks used in web applications development.

UNIT I - J2EE BASICS (9)

Introduction to J2EE - J2EE Overview - Why J2EE? - J2EE Architecture - Distributive systems - J2EE multitier architecture - Client tier architecture - Web tier implementation - EJB tier implementation - Enterprise information systems tier implementation - Myths of using inheritance - Maintainable classes.

UNIT II - J2EE DATABASE CONCEPTS (9)

Data base – Tables - Database schema - The art of indexing - JDBC objects -The concept of JDBC - JDBC driver types –JDBC packages: A brief overview of the JDBC process - Database connection - Associating the JDBC / JDBC bridge with database - Result set - Transaction processing - Data types - Exceptions.

UNIT III - JDBC AND EMBEDDED SQL (9)

Model programs - Tables - Indexing - Inserting data into tables - Selecting data from a table – Metadata - Updating tables - Deleting data from a table - Joining tables - Calculating data - Grouping and bordering data – Subqueries – View.

UNIT IV - J2EE INTERCONNECTIVITY (9)

Java mail API - Java interface definition language and corba - Java RMI (remote method invocation) - Java message service – Security: J2EE security concepts.

UNIT V - WEB SERVICES (9)

SOAP – UDDI - Electronic business XML - Java API for XML registries (JAXR) - Web services decription languages (WSDL).

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Black " Java server programming" J2EE(1.7) , 1st ed., Dream Tech Publishers, 2014.
2. Jim Keogh "The complete reference J2EE", 2nd ed., Tata McGraw Hill publishers, 2007.

REFERENCES:

1. Herebert schildt " Java 2 complete reference" 5th ed., TMH, 2008.
2. Kathywalrath " The J2EE tutorial" , 1st ed., Addison Wesley Publishers, 2005.
3. Subrahmanyam Allamaraju and Cedric Buest , "Professional Java Server Programming (J2EE 1.3 Edition) ", Shroff Publishers & Distributors Pvt Ltd.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x				x						x
2	x						x			x		
3		x				x						x
4				x					x	x		
5		x	x								x	

Approved by Sixth Academic Council

15ITX08 - PROGRAMMING WITH PERL

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the fundamental concepts in Perl.
- To learn fundamental operations and functions in Perl.
- To have a knowledge in using OOP with Perl.
- To know about advanced Perl.
- To have a knowledge in using MySQL with Perl.

COURSE OUTCOMES:

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

CO1: Get the introduction about basics of Perl.
CO2: Understand the Operators, Functions and File handling concepts.
CO3: Understand OOP concepts.
CO4: Familiarize with advanced Perl.
CO5: Understand the MySQL.

UNIT I - ELEMENTS OF VECTOR CALCULUS **(9)**

Introduction – Environment setup – Syntax overview - Perl Data Types – Perl Variables – Scalar, Array, Hash, Variable context – Perl Arrays - Control Flow.

UNIT II - OPERATORS, FUNCTIONS AND FILE HANDLING **(9)**

Operators – Functions - Subroutines – References – Formats – File I/O – Directories – Error Handling - Data and Time.

UNIT III - OBJECT ORIENTED PERL **(9)**

Defining a class – Creating and using objects – Attributes - Methods - Constructor and Destructors - Inheritance – Method overriding – Destructor and Garbage Collection.

UNIT IV - PERL ADVANCED **(9)**

Regular Expressions – Packages - Modules – Types of Modules, Including other files –CGI Programming – Architecture, HTTP Header, Environment variables, GET and POST Methods – Cookies in CGI -Sending mail.

UNIT V - PERL AND DATABASE **(9)**

Perl and DBM – DBM Implementations – Perl and DBI – Connecting Perl with MySQL using DBI – Operations – Insert, Runtime Value Binding, Read, Update, Delete.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Randal L. Schwartz, brian d foy, Tom Phoenix, "Learning Perl", 7thEdition, October 2016.

REFERENCES:

1. https://www.tutorialspoint.com/perl/index.html
2. https://www.perl.org/books/beginning-perl/
3. http://users.cs.cf.ac.uk/Dave.Marshall/PERL/

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x						x		
2			x				x					
3				x		x				x		
4		x	x	x		x						
5		x		x			x					

Approved by Sixth Academic Council

15IT611 - INTERNET OF THINGS LABORATORY				
	L	T	P	C
	0	0	4	2

OBJECTIVES:

- To understand how sensors and embedded systems work
- To understand how to program on embedded and mobile platforms including ESP8266 and Android
- To understand how to communicate with other mobile devices using various communication platforms such as Bluetooth and Wi-Fi.

COURSE OUTCOMES:

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

CO1:Understand basics of IoT applications.
CO2:Understandand know to implement various sensors.
CO3:Develop their own IoT applications and deploy it.
CO4:Develop their own IoT applications and deploy it.
CO5:Develop their own IoT applications and deploy it.

LIST OF EXPERIMENTS:

1. Basic Arduino Program with LED Blink
2. Basic Arduino Program with Buzzer Control.
3. Audrino Program for key input with LED and TIMER.
4. Audrino Program with Servo Motor control.
5. Audrino Program with LCD control.
6. Audrino Program with LDR control.
7. Web based Audrino Program with IoT Control.
8. Displaying and Control Sensor value in Web.
9. Web Socketing.
10. Sensor value logging in Cloud.

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TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x		x				x		
2			x				x	x				x
3				x		x		x		x		x
4			x				x	x				x
5		x		x		x				x		

Approved by Sixth Academic Council

15ITW05 - PROGRAMMING WITH PHP LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES:

- To understand the fundamental concepts in PHP.
- To understand the advanced concepts of PHP.
- To learn PHP with MySQL.

COURSE OUTCOMES:

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

CO1: Understanding the basics of PHP.
CO2: Understanding the concepts of Control flows, Strings, Arrays and Functions.
CO3: Understanding the OOP concepts with PHP.
CO4: Handling forms in PHP and advanced PHP.
CO5: Understanding MySQL with PHP.

LIST OF EXPERIMENTS

1. Programs on datatypes and variables.
2. Programs on Flow controls
3. Programs on Strings and Arrays.
4. Programs on Class and Objects.
5. Programs on Inheritance.
6. Programs on PHP Forms.
7. Programs on JQuery with PHP.
8. Programs on Files with PHP.
9. Programs on cookies and sessions.
10. Programs on Mysql with PHP.

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x						x		x
2											x	
3			x				x			x	x	
4						x					x	x
5				x		x				x		

15ITWO6 - PROGRAMMING WITH PYTHON LABORATORY				
	L	T	P	C
	0	0	4	2

OBJECTIVES:

- To learn how to design and program Python applications.
- To learn how to build and package Python modules for reusability.
- To learn how to read and write files in Python.
- To learn how to use class inheritance in Python for reusability.
- To learn how to use exception handling in Python applications for error handling.

COURSE OUTCOMES:

.

CO 1 : Understand and apply the basics of the Python programming language
CO 2 : Execute Python code in a variety of environments.
CO 3 : Use the correct Python control flow construct.
CO 4 : Trap various errors via the Python Exception Handling model.
CO 5 : Create their own classes and use existing Python classes.

LIST OF EXPERIMENTS

1. Write basic programs of Python.
2. Write a python program on Decision Making and Looping.
3. Write a python program on functions.
4. Write a python program on operators.
5. Write a python program on tuples and methods.
6. Write a python program on modules.
7. Write a python program on File Handling methods.
8. Write a python program on Inheritance.
9. Write a python program on Matching and Searching.
10. Write a python program on Grouping with Parentheses.

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x					x			x			
2									x		x	
3										x		
4				x		x			x			x
5	x					x			x			

15ITW07 - PROGRAMMING WITH JAVA 2 ENTERPRISE EDITION LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES :

- Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
- Design and develop Web applications
- Designing applications using pre-built frameworks.

COURSE OUTCOMES:

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

CO1: Make a reusable software component, using Java Bean.
CO2: Create dynamic web pages, using Servlets and JSP.
CO3: Invoke the remote methods in an application using Remote Method Invocation.
CO4: Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).
CO5: Develop Stateful, Stateless and Entity Beans.

LIST OF EXPERIMENTS:

1. Program illustrating Simple Servlet Showing Different Styles of a Phrase.
2. Program illustrating Displaying Multiplication Table in Servlet for a Number Entered in Html Page.
3. Programs illustrating Manipulating Strings in Servlet Entered in Html.
4. Programs illustrating the Designing a Login Form Using Html and Displaying the Contents of the Login Form along with Date and Time in Servlet.
5. Program illustrating Registering a New User and Displaying the Number of Visits Made by the Existing User using Cookies.
6. Programs illustrating Finding the Presence of a value and its Position in the Cookie List, otherwise Registering the Value as a Cookie.
7. Write programs illustrating Mark List Processing in Servlet with Records Taken from MS-Access.
8. Programs illustrating Client – Server Communication using RMI.
9. Programs illustrating Incorporating HTML in JSP.

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x				x						x
2	x						x			x		
3		x				x						x
4				x					x	x		
5		x	x								x	

Approved by Fifth Academic Council

15ITW08 - PROGRAMMING WITH PERL LABORATORY

L	T	P	C
0	0	4	2

OBJECTIVES :

- To understand the fundamental concepts in Perl.
- To learn fundamental operations, arrays, functions in Perl.
- To have a knowledge in using OOP with Perl.
- To understand the Perl CGI.
- To have a knowledge in using MySQL and DBI.

COURSE OUTCOMES:

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

CO1: Get the introduction about basics of Perl.
CO2: Understand the Operators, Arrays, and Functions.
CO3: Understand OOP concepts.
CO4: Familiarize with Perl CGI.
CO5: Understand the MySQL and DBI.

LIST OF EXPERIMENTS

1. Write a Perl program to create Arrays and Hashes.
2. Write a Perl program to create Loops, Arguments and I/O.
3. Write a Perl program to create Functions and Arguments.
4. Write a Perl program to create File Reader.
5. Write a Perl program to create a Simple Class using Object Oriented Interface.
6. Sending an E-Mail through Perl.
7. Write a Perl CGI program for Red, Green and Blue to Hexadecimal Converter.
8. Write a Perl CGI program to create a Web Page Counter.
9. Write a Perl program to connect MySQL and DBI.
10. Working with various database transactions using Perl and DBI.

TOTAL (P:60) = 60 PERIODS

Mapping of Course Outcomes and Programme Outcome

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x		x						x		
2			x				x					
3				x		x				x		
4		x	x	x		x						
5		x		x			x					

15GE611 - COMPREHENSION

L	T	P	C
0	0	2	1

OBJECTIVE:

- To encourage the students to comprehend the knowledge acquired from the first Semester to Sixth Semester of B.E Degree Course through periodic exercise.

COURSE OUTCOMES:

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

CO1 Understand and comprehend any given problem related to Information Technology field.
CO2 Assess the studied topics
CO3 Recall the learnt technologies
CO4 Understand analytical part of the technology
CO5 Enrich with the depth knowledge of various technologies

METHOD OF EVALUATION:

The student will be assessed for his understanding of the basic principles of the core engineering subjects. The internal assessment for a total of 50 marks will be evaluated by a committee comprising of the faculty members of the department. The committee will conduct three written examinations of objective question type from the subjects as follows

- Test 1 - C Programming, Data Structures, Operating systems, Computer Networks.
- Test 2 - Java Programming, Database Systems, Computer Architecture, Software Engineering.
- Test 3 - Mobile Computing, Web technology, Object Oriented Analysis and Design.

The end semester examination, which carries a total of 50 marks, will be an objective question type examination conducted by a committee of one internal examiner appointed by the COE of our college.

TOTAL (P:30) = 30 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x						x	x
2			x									
3					x		x			x	x	
4						x				x	x	
5						x				x		

Approved by Fifth Academic Council

15GY611 - SOFT SKILLS APTITUDE AND REASONING – II

(Common to All Branches)

L	T	P	C
0	0	2	0

OBJECTIVE:

- To enhance the students to write and speak fluently with the help of grammatical structures.
- To develop students to workout solution for problems that involves mathematical aptitude.
- To develop students to workout solutions for problems that involves general reasoning.

COURSE OUTCOMES:

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

CO1 : Write and speak fluently without any grammatical errors.

CO2 : Solve aptitude problems with ease.

CO3 : Solve reasoning problems with ease.

UNIT I SOFT SKILLS **(10)**

Grammar – Synonyms and Antonyms, Error Spotting, Statement Completion, Idioms & Phrases, One word Substitution, Confusable Words, Jumbled Words / Sentences, Reading Comprehension, Theme Detection, Punctuation – Job Application with Resume – Written Communication - Impromptu Speech – Group Discussion – Mock Interview.

UNIT II APTITUDE **(10)**

Simple Interest - Probability - Speed & Distance – Time & Work - Calendar - Clock

UNIT III REASONING **(10)**

Analogy - Blood Relations - Directions - Data Interpretation - Data sufficiency

TOTAL (L:30) = 30 PERIODS

TEXT BOOKS:

1. Thorpe, Edgar and Shawick Thorpe, *Objective English,* 3rd ed. New Delhi: Pearson, 2011 Print.
2. Khattar, Dinesh, *Quantitative Aptitude*, 3rd ed. New Delhi: Pearson, 2014 Print.

REFERENCES:

1. Prasad, Hari Mohan & Uma Rani Sinha, *Objective English for Competitive Examinations,* 4th ed.New Delhi: Tata McGraw Hill Education Pvt.Ltd., 2010 Print.
2. Aggarwal R.S., *A Modern Approach to Verbal & Non Verbal Reasoning*, Revised Edition, New Delhi: S.Chand Publishers, 2017 Print.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1							x	x	x	x		x
2												x
3							x	x				x

Approved by Fifth Academic Council

15ITX09 - SOCIAL NETWORK ANALYSIS

L	T	P	C
3	0	0	3

OBJECTIVES :

- Understand the concept of semantic web and related applications.
- Learn knowledge representation of Web Mining.
- Understand human behaviour in social web and related communities.
- Learn visualization of social networks.

COURSE OUTCOMES:

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

CO 1: Develop semantic web related applications.
CO 2: Represent knowledge using ontology.
CO 3 : Predict human behaviour in social web and related communities.
CO 4: Visualize Web Content Mining.
CO 5: Understand Web Linkage Mining.

UNIT I - INTRODUCTION (9)

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 KNOWLEDGE REPRESENTATION (9)

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modelling 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 AND NETWORKS (9)

Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods 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 - WEB CONTENT MINING (9)

Web Content Mining: Vector Space Model, Web Search, Activities on Web archiving, Personalized Web Search, Feature Enrichment of Short Texts, Latent Semantic Indexing, Automatic Topic Extraction from Web Documents Opinion.

UNIT V - WEB LINKAGE MINING (9)

Hyperlinks- co-citation and bibliographic coupling- page rank and HITS algorithm–web community discovery – web graph measurement and modeling- using link information for web page classification.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Guandongxu and Yanchun zhang, “Web mining and social networking: techniques”, “Springer Science and Business Media”, 2011 Bing Liu, “Web Data Mining”, Springer, 2010.
2. Borko Furht, “Handbook of Social Network Technologies and Applications”, 1st Edition, Springer, 2010.
3. Peter Mika, “Social Networks and the Semantic Web”, First Edition, Springer 2007.

REFERENCES:

1. GuandongXu ,Yanchun Zhang and Lin Li, "Web Mining and Social Networking – Techniques and applications", First Edition Springer, 2011.
2. Dion Goh and 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 Soulé-Dupuy, "Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling", IGI Global Snippet, 2009.
4. ohn G. Breslin, Alexander Passant and Stefan Decker, "The Social Semantic Web", Springer, 2009.

Mapping of Course Outcome and Programme Outcomes

Mapping of COs and POs												
COs	**POs**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	x	x				x			x		x	
2			x									
3	x				x			x				
4		x	x	x			x		x		x	x
5		x		x	x					x	x	x

Approved by Fifth Academic Council

15ITX10 - DATA MINING

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand and implement classical models and algorithms in data warehousing and data mining.

COURSE OUTCOMES:

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

CO1: Know the fundamental concepts and benefits of data warehousing and mining.
CO2: Know the data cleaning, integration and transformation.
CO3: Know the data mining techniques.
CO4: Know the correct and accuracy of data.
CO5: Know the cluster analysis and methods.

UNIT I - INTRODUCTION (9)

Introduction: Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases – Relational databases – Data warehouses – Transactional databases – Object oriented databases – Spatial databases – Temporal databases – Text and Multimedia databases – Heterogeneous databases - Mining Issues – Metrics – Social implications of Data mining.

UNIT II - DATA PREPROCESSING (9)

Data Preprocessing: Why Preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization.

UNIT III - DATA MINING TECHNIQUES (9)

Data Mining Techniques: Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining.

UNIT IV - CLASSIFICATION AND PREDICTION (10)

Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy.

UNIT V - CLUSTERING TECHNIQUES (8)

Clustering Techniques: cluster Analysis – Clustering Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis – Introduction to Advanced Topics: Web Mining, Spatial Mining and Temporal Mining.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. J. Han and M. Kamber , Data Mining: Concepts and Techniques, Morgan Kaufmann,3rd Edition 2011.

Mapping of Course Outcome and Programme Outcomes

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x									x	x
2		x	x					x	x			
3				x	x						x	x
4		x	x			x	x					
5		x			x	x						x

Approved by Fifth Academic Council

15ITX11 - WIRELESS NETWORKS

L	T	P	C
3	0	0	3

OBJECTIVES :

- To study about Wireless networks, protocol stack and standards.
- To study about fundamentals of 3G Services, its protocols and applications.
- To study about evolution of 4G Networks, its architecture and applications.

COURSE OUTCOMES:

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

CO1 : Characterize wireless channels.
CO2 : Conversant with the latest 3G/4G and WiMAX networks and its architecture.
CO3 : Design and implement wireless network environment for any application using latest wireless protocols and standards.
CO4 : Implement different type of applications for smart phones and mobile devices with latest network. strategies.
CO5 : Learn about 4G networks.

UNIT -1 - WIRELESS LAN (9)

Introduction-WLAN technologies: Infrared, UHF narrowband, spread spectrum -IEEE802.11: System architecture, protocol architecture, physical layer, MAC layer, 802.11b, 802.11a – Hiper LAN: WATM, BRAN, HiperLAN2 – Bluetooth: Architecture, Radio Layer, Baseband layer, Link manager Protocol, security - IEEE802.16-WIMAX: Physical layer, MAC, Spectrum allocation for WIMAX.

UNIT-2 MOBILE NETWORK LAYER (9)

Introduction - Mobile IP: IP packet delivery, Agent discovery, tunneling and encapsulation, IPV6- Network layer in the internet- Mobile IP session initiation protocol - mobile ad-hoc network: Routing, Destination Sequence distance vector, Dynamic source routing.

UNIT-3 MOBILE TRANSPORT LAYER (9)

TCP enhancements for wireless protocols - Traditional TCP: Congestion control, fast retransmit/fast recovery, Implications of mobility - Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, Transaction oriented TCP - TCP over 3G wireless networks.

UNIT-4 WIRELESS WIDE AREA NETWORK (9)

Overview of UTMS Terrestrial Radio access network-UMTS Core network Architecture: 3G-MSC, 3GSGSN, 3G-GGSN, SMS-GMSC/SMS-IWMSC, Firewall, DNS/DHCP-High speed Downlink packet access (HSDPA)- LTE network architecture and protocol.

UNIT-5 4G NETWORKS (9)

Introduction – 4G vision – 4G features and challenges - Applications of 4G – 4G Technologies: Multicarrier Modulation, Smart antenna techniques, OFDM-MIMO systems, Adaptive Modulation and coding with time slot scheduler, Cognitive Radio.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS :

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

REFERENCES:

1. David Tse and Pramod Viswanath, “Fundamentals of Wireless Communication”, Cambridge University Press, 2005.
2. Upena Dalal, “ Wireless Communication”, Oxford University Press, 2009. 3. Van Nee, R. and Ramji Prasad, “OFDM for wireless multimedia communications”, Artech House, 2000.

Mapping of Course Outcomes and Programme Outcomes

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1			x									
2	x				x				x		x	
3	x		x						x			
4	x		x		x							
5				x		x	x					

Approved by Fifth Academic Council

15ITX12 - MOBILE COMMUNICATION

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand the concepts used in Cellular System.
- To understand the concepts of different Wireless networks
- To study the functions of Mobile Network Layer and Transport Layer.

COURSE OUTCOMES:

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

CO1: Identify the components required to build Cellular Wireless Network.
CO2 : Choose the required wireless network for given application.
CO3 : Identify solution for routing issues, at Network layer.
C04 : Learn about Wireless Adhoc Network.
CO5 : Trace the flow of information in all kind of mobile network applications.

UNIT -1 CELLULAR WIRELESS NETWORKS (9)

Introduction to Mobile Communication - Principles of Cellular Networks- Concept of Cell-Frequency reuse -Operation of Cellular Systems- Handoff, 2G - GSM architecture – GPRS architecture reference model–Advantages and Design Considerations of CDMA, 3G- Design Considerations of WCDMA-TMT 2000,Overview of 4G.

UNIT-2 WIRELESS NETWORKS (9)

Wireless LAN – IEEE 802.11 System Architecture - Infrastructure based and ad-hoc network –Standards & Services- Protocol architecture, Bluetooth- WPAN- Architecture - Protocol stack-LLCAP- IEEE 802.15 and subgroups, WiMAX and IEEE 802.16 Broadband Wireless Access Standards–System and Protocol Architecture – Services.

UNIT-3 MOBILE NETWORK LAYER (9)

Mobile IP-Goals, assumptions and requirements- Entities and terminology- Agent discovery- Registration- Tunneling and encapsulation, DHCP - Client initialization via DHCP, Mobile ad-hoc networks- MANETs and mobile IP, Routing- overview of DSDV & DSR, ad-hoc routing protocols.

UNIT-4 MOBILE TRANSPORT LAYER (9)

Overview of Traditional TCP- Congestion control- Slow start- Fast retransmit/fast recovery, Classical TCP improvements - Indirect TCP- Snooping TCP - Mobile TCP- Selective retransmission-Transaction oriented 6TCP, TCP over 2.5/3G wireless networks.

UNIT-5 MOBILITY SUPPORT (9)

System architecture-Client Proxy as Browser- Network Proxy as Browser Support - Client and Network Proxy with Special Transmission Protocol, Wireless Application Protocol- Forum- Architecture- WDP- WTLS- WTP- WTP classes- WSP-WAE Wireless Telephony Application-User Agent - Logical Architecture, WAP 2.0- Architecture - Protocol Stacks.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS :

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2014.
2. William Stallings, “Wireless Communications and Networks”, Pearson Education, 2007.

REFERENCES:

1. Rappaport, “Wireless Communications: Principles and Practice”, Pearson Education India, 2009.
2. Andreas F. Molisch,“Wireless Communications”, 2nd Edition, Willy Publication, 2010.
3. B.S.Manoj, C.Siva Ram Murthy, “Adhoc Wireless Networks”, Pearson Education, 2014.

Mapping of Course Outcomes and Programme Outcomes

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x					
2	x	x					x		x		x	
3	x	x	x				x		x			
4	x	x	x				x					
5				x		x	x					

Approved by Fifth Academic Council

15ITX13 - CLOUD COMPUTING

L	T	P	C
3	0	0	3

OBJECTIVES :

- To know the role of cloud computing.
- To learn the basics of cloud management and concept of virtualization.
- To work on cloud environment.
- To work on cloud applications.

COURSE OUTCOMES:

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

CO1: Understand the basic terminology used incloud computing.
CO2: Use different virtualization technology in cloud management.
CO3: Design programs involving cloud infrastructure &security.
CO4: Explain the extension of cloud in smart devices.
CO5: Understand the cloud applications.

UNIT I - INTRODUCTION TO CLOUD COMPUTING (9)

Introduction – Characteristics of Cloud Computing – Overview of Cloud Application – Cloud Computing Architecture – Logical Architecture, Types of Clouds, Role of Standard. Cloud computing services – Scalability and Fault Tolerance.

UNIT II - CLOUD MANAGEMENT AND VIRTUALIZATION TECHNIQUES (9)

Creating a virtualized architecture – Data Center, Data center Network Architecture. Concepts of Map Reduce- Fundamental concepts of compute Storage- Network Virtualization- Desktop and application Virtualization- Block and File level Storage Virtualization- Infrastructures Requirements- Benefits of Virtualization.

UNIT III -CLOUD SECURITY (9)

Fundamentals- Cloud security services- Design principles- Policy implementation- Security challenges- Security Architecture- Public key infrastructure, Encryption key management, Digital certificates and Key managements. Market based management of clouds.

UNIT IV -HADOOP AND MAP REDUCE (9)

Introduction- Data sources – Data Storage and Analysis – Comparison with other system- Case Study: The Apache HADOOP Project – Cluster Setting. Map Reduce – Weather Dataset – analyzing the Data with UNIX Tools – Analyzing the Data with HADOOP – HADOOP Streaming- HADOOP Pipes.

UNIT V - CLOUD APPLICATIONS (9)

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists –Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Kris Jamsa ,Jones and Bartlett, “Cloud Computing SAAS , PaaS, IaaS, Virualization, Business Models, Security & more”, Student Edition , 2014. (Unit 1,2,3,4)
2. Michael Miller,”Cloud Computing: Web-Based Applications that Change the Way YouWork and Collaborate Online”.Que Publishing, August 2008. (Unit 5)

REFERENCES:

1. Kailash Jayaswal, Jagannath Kallakurchi, Donald J.Houde, Dr.DevenShah , “Cloud Computing, Kogent Learning Solutions” , Indispensable Comprehensive Reference, 2014.
2. Pankaj Sharma, Cloud Computing, S.K. Kataria& Sons Publisher of Engineering and Computer Books,2013.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x					
2	x	x					x		x		x	
3	x	x	x				x		x			
4	x	x	x				x					
5				x		x	x					

Approved by Fifth Academic Council

15ITX14 - ETHICAL HACKING

L	T	P	C
3	0	0	3

OBJECTIVES :

- To investigate the importance of ethical hacking and its implementation in organizations
- It focuses on latest security threats, advanced attack vectors, and practical real time demonstration of the latest Hacking Techniques, methodologies, tools, tricks, and security measures.

COURSE OUTCOMES:

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

CO1 : Know about basic hacking tricks.
CO2 : Learn how to hack networking, web and password.
CO3 : Know types of hacking attacks.
CO4 : Know latest security threats and Hacking Techniques.
CO5 : Develop knowledge of contemporary cyber security issues, and use techniques, skills and modern engineering tools necessary for computer security engineering practice.

UNIT I - INTRODUCTION (9)

Hacking Windows: BIOS Passwords – Windows Login Passwords - Changing Windows Visuals –Cleaning Tracks – Internet Explorer users – Cookies – Netscape Communicator – Register - The Registry Editor – Description of reg file – other systems files – The Untold – Windows Tips – Tricks –Manual – Cleaning Recent Docs Menu and RUN MRU – Internet Explorer Tricks and Tips.

UNIT II -NETWORK HACKING & WEB HACKING (9)

Network Hacking: Telnet – Domain Name Systems – Sockets and Ports – PING – Traceroute , Netstat – Getting Information about a Domain – Port 23 – FTP Port – FTP Client – FTP commands – FTP Hacks. Web Hacking: HTTP Torn Apart – Get Method – Post Method –Head Method – Web Browser – Post Dial Up Screen Hacking – Making Own Browser – Removing Banners from Free ISPs – Difficult to Detect Port Scanner – GEOCITIES-TRIPOD – XOOM.

UNIT III -PASSWORD HACKING (9)

Introduction – Password Cracking – Cracking the Windows – Glide Code – Windows Screen Saver Password – XOR – Internet Connection Password – Windows NT Password – Cracking Unix Password Files – HTTP authentication – BIOS Passwords – Cracking other passwords – Remote Access Sharing Password Decoding – Breaking DES Algorithm – Brute Force Password Cracking –Default Passwords.

UNIT IV ATTACKS (9)

Input Validation Attacks: The Art of Input Validation Attacks – Input Validation Dangers – Hotmail.com- Apache Web Server. Buffer Overflow Attacks: Types of Buffer Overflows – Basic Programming Errors. Privacy Attacks: Trojan Attacks – Detection – Countermeasures – Key logger Attacks – Working.TCP/IP: Checksums – Packet Sequencing – Handshaking –Transport Layer – TCP/UDP Protocols – Link layer. Denial of Services Attacks: Ping of Death – DOS Attacks – Teardrop –SYN Attack – Smurf Attacks – UDP Flooding.

UNIT V -LAWS AND ACTS: (9)

Laws and Ethics, Digital Evidence Controls, Evidence Handling Procedures, Basics of Indian Evidence ACT IPC and CrPC , Electronic Communication Privacy ACT, Legal Policies.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK :

1. Ankit Fadia, “An Unofficial Guide To Ethical Hacking”, Macmillan India Ltd, 2006.

REFERENCE :

1. Matt Walker, “CEH Certified Ethical Hacker All-in-One Exam Guide”, Second Edition McGraw-Hill Osborne Media, 2014**.**

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x									x
2		x							x		x	
3		x	x						x			
4	x	x	x				x			x		x
5				x		x	x					

Approved by Fifth Academic Council

15ITX15 - COMPUTER GRAPHICS AND MULTIMEDIA

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand computational development of graphics with mathematics.
- To provide in-depth knowledge of display systems, image synthesis, shapemodelingof3D.
- To understand basic concepts of color models
- To Experiencedevelopmentofmultimediasoftwarebyutilizingexistinglibrariesanddescriptionsof algorithms.

COURSE OUTCOMES:

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

CO1 : Gain proficiency in 3D computer graphics API programming.
CO2 : Enhance the perspective of modern computer system.
CO3 : Study modeling, analysis and interpretation of 2D&3Dvisualinformation.
CO4 : Study color models and their applications.
CO5 : State the properties of different media streams.

UNIT I - INTRODUCTION ANDOVERVIEW OF GRAPHICSSYSTEMS (8)

Introduction- Use of Computer graphics- Points and Lines- Line Drawing Algorithms (DDA & Bresenham's)- Circle and Ellipse Generating Algorithms- Conic Sections.

UNIT II - TWO-DIMENSIONAL GEOMETRIC TRANSFORMATIONS (8)

Basic transformations and their matrix representations - Homogeneous Coordinates - Composite Transformations- transformations between Coordinate Systems- Affine transformations- Window-to-Viewport Coordinate transformation – Clipping: Point, Line, Polygon, Curve and Text Clipping.

UNIT III -THREE-DIMENSIONAL TRANSFORMATIONS AND VIEWING (9)

Translation –Rotation - Scaling - Reflection-Shears-Composite Transformations-Projections- Parallel and Perspective – Projection Transformations - Clipping.

UNIT IV -COLOR MODELS AND COLOR APPLICATIONS (10)

Properties of Light – XYZ Color Model – Intuitive Color Concepts – RGB Color Model – YIQ Color Model – CMY Color Model – HSV Color Model – Conversion Between HSV and RGB Models –HLV Color Model – Color Selection and Applications.

UNIT V -MULTIMEDIA (10)

Introduction : Definition of multimedia - Multimedia Basics - Where to use Multimedia - Multimedia Elements – Multimedia Applications - Virtual Reality – Delivering Multimedia. Multimedia Systems Architecture: Multimedia Workstation Architecture - High resolution Graphic displays - Multimedia Architecture Based on interface bus - Network architecture for Multimedia systems

TOTAL (L:45) = 45 PERIODS

TEXTBOOKS:

1. D. Hearn &M.P. Baker "Computer Graphics," 4TH edition, Pearson Education, New Delhi,2011.
2. Prabat K Andleigh and Kiran Thakrar,"Multimedia Systems and Design", PHI, 2005.

REFERENCES:

1. W.M. Newman. et.al. "Principle of Interactive Computer Graphics", McGraw Hill Publication, New Delhi, 1995.
2. S.Harrington "Computer Graphics –A Programming Approach", McGraw Hill Publication, New Delhi, 1994.
3. J.D. Foley et. Al "A Fundamental of Computer Graphics" Addition Wesley, London, 1993.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1										x		
2	x			x				x				
3						x				x	x	x
4		x									x	x
5								x				x

Approved by Fifth Academic Council

15ITX16 - INFORMATION STORAGE MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVES :

- To learn basic concepts of storage concepts.
- To learn about cloud storage
- To learn about security in storage technology.

COURSE OUTCOMES:

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

CO1 : Understand the concepts of Storage technology.
CO2 : Understand the storage system architecture.
CO3 : Understand network storage concepts.
CO4 : Understand Virtualization.
CO5 : Understand the concepts of Information storage on cloud.

UNIT I - Introduction to Storage Technology (9)

Data creation and The value of data to a business, Information Lifecycle, Challenges in data storage and data management, Solutions available for data storage, Core elements of a Data Centre infrastructure, role of each element in supporting business activities.

UNIT II - Storage Systems Architecture (9)

Hardware and software components of the host environment, Key protocols and concepts used by each component, Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications, Concept of RAID and its components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Integrated and Modular storage systems, high-level architecture and working of an intelligent storage system.

UNIT III - Introduction to Networked Storage (9)

Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfil the need, Understand the appropriateness of the different networked storage options for different application environments.

UNIT IV - Securing Storage and Storage Virtualization (9)

Information Security, Critical security attributes for information systems, Storage security domains, Analyze the common threats in each domain. Storage Virtualization: Forms, Configurations and Challenges. Types of Storage Virtualization: Block-level and File-Level.

UNIT V - Information storage on Cloud (9)

Introduction – Cloud computing models – Benefits – Challenges – Storage on cloud – Vocabulary – Applications and Services on Cloud – Architectural Framework – Applications in Cloud computing Architecture – Cloud Security and Integration.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Pankaj Sharma, “Information Storage & Management”, S.K Kataria & Sons,2012.

REFERENCES:

1. G. Somasundaram, Alok Shrivastava, EMC Education Series, “ Information Storage and Management”, Wiley, Publishing Inc., 2011.
2. Robert Spalding, “Storage Networks: The Complete Reference”, Tata McGraw Hill, Osborne, 2003.
3. Marc Farley, “Building Storage Networks”, Tata Mc Graw Hill, Osborne. 2001.
4. Meeta Gupta, Storage Area Network Fundamentals, Pearson Education Limited, 2002

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x		x				x		
2		x		x							x	
3			x									
4	x		x	x						x		
5	x		x	x		x			x	x	x	

Approved by Fifth Academic Council

15CSX14 - HUMAN COMPUTER INTERACTIONS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand fundamentals of human computer interaction.
- To design various models for interaction.
- To Learn design techniques and fundamentals of Human Computer Interaction.
- To know various types of existing interfaces and evaluation techniques.
- To understand applications of HCI in emerging trends.

COURSE OUTCOMES:

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

CO1 : Understand the requirements and specifications for the interaction design.
CO2 : Analyze the evaluation techniques of human interaction.
CO3 : Determine the most appropriate HCI methods to meet the needs of a practical software development Project.
CO4 : Identify, analyzes, formulate and solve engineering problems.
CO5 : Understand the impact of engineering solutions in a global, economic, environmental, and societal context.

UNIT-I INTRODUCTION:THE HUMAN AND COMPUTER (9)

The Human: Introduction – Input – output Channels – Human memory – Thinking: reasoning and problem – solving – Individual differences – Psychology and the design of interactive systems –The computer: Introduction – Text entry devices – Positioning – pointing and drawing – Paper: printing and scanning – Memory – Processing and networks.

UNIT -2 INTERACTION AND INTERFACES (9)

The Interaction: Introduction – Models of interaction – Frameworks and HCI – Ergonomics – Interaction styles – Elements of the WIMP interface – Interactivity –The context of the interaction – Experience – Engagement and fun – Paradigms: Introduction – Paradigm for interaction – Expressive interfaces – models of emotions – interface types.

UNIT-3 DESIGNING RULES (9)

Interaction design basics: Introduction –The process of design – User focus–Scenarios – Navigation design – Screen design and layout – Iteration and Prototyping – HCI in the software process: Introduction – The software life cycle – Usability engineering – Iterative design and prototyping – Design rationale – Design rules: Introduction – Principles to support usability – Standards – Guidelines – Golden rules and heuristics –HCI patterns.

UNIT-4 MODELS AND EVALUATION FRAMEWORK (9)

Cognitive models: Introduction – Goal and task hierarchies – Linguistic models – The challenge of display – based systems – Physical and device models – cognitive architecture – Communication and collaboration model: Introduction – Face-to-face communication – Conversation – Text-based communication – Group working –Models of the system: Introduction – Standard Formalism – Interactive models – Continuous behavior.

UNIT-5 INTERFACING APPLICATIONS (9)

Groupware: Introduction – Groupware systems – Computer – mediated communication – Meeting and decision support systems – Shared applications and artifacts – Frameworks for groupware – Implementing synchronous groupware – Hypertext – multimedia and the World Wide Web: Introduction – Understanding hypertext – Finding things – Web technology and issues – Static web content – Dynamic web content.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Alan Dix, Janet Finlay, Gregory D.Abowd and Russell Beale, “Human-Computer Interaction”, Prentice Hall, Third edition, 2009.

REFERENCES:

1. J. Preece, Y. Rogers, H. Sharp, D. Benyon, S. Holland and T. Carey, “Human-Computer Interaction”, Addison Wesley, 1994.
2. Andrew Sears, Julie A. Jacko, “The Human-Computer Interaction Handbook Fundamentals, Evolving Technologies, and Emerging Applications”, Second Edition, Taylor& Francis Group, 2008.
3. Claude Ghaoui, “Encyclopaedia of Human Computer Interaction”, Wiley, 2000.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x									x		x
2	x	x	x							x		x
3	x	x	x			x	x			x		
4	x		x	x			x		x	x		x
5	x		x	x			x					x

15ITX17 - COMPOSING MOBILE APPS

L	T	P	C
3	0	0	3

OBJECTIVES:

This course aims to teach mobile app development using Android as the development platform.

COURSE OUTCOMES:

At the end of this elective, student shall be able to:

CO1 : Appreciate the Mobility landscape
CO2 : Familiarize with Mobile apps development aspects
CO3 : Design and develop mobile apps, using Android as development platform, with key focus on user Experience.
CO4 : Appreciation of nuances such as native hardware play, location awareness, graphics, and multimedia
CO5 : Design, native data handling and background tasks and notifications.

UNIT I - GETTING STARTED WITH MOBILITY (9)

Mobility landscape, Mobile platforms, Mobile apps development, Overview of Android platform, setting up the mobile app development environment along with an emulator, a case study on Mobile app development. App user interface designing – mobile UI resources (Layout, UI elements, Draw-able, Menu), Activity- states and life cycle, interaction amongst activities.

UNIT II - BUILDING BLOCKS OF MOBILE APPS (9)

App functionality beyond user interface – Threads ,Async task, Services – states and lifecycle, Notifications, Broadcast receivers, Telephony and SMS APIs - Native data handling – on-device file I/O, shared preferences, mobile databases such as SQLite, and enterprise data access (via Internet/Intranet)

UNIT III - SPRUCING UP MOBILE APPS (9)

Graphics and animation – custom views, canvas, animation APIs, multimedia – audio/video playback and record, location awareness, and native hardware access (sensors such as accelerometer and gyroscope)

UNIT IV - TESTING MOBILE APPS (9)

Debugging mobile apps, White box testing, Black box testing, and test automation of mobile apps, JUnit for Android, Robotium, MonkeyTalk

UNIT V - TAKING APPS TO MARKET (9)

Versioning, signing and packaging mobile apps, distributing apps on mobile market place.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Anubhav Pradhan, Anil V Deshpande, “Mobile Apps Development”, First Edition, 2013.

REFERENCES:

1. Barry Burd, “Android Application Development All in one for Dummies”, First Edition, 2013.
2. “Teach Yourself Android Application Development In 24 Hours”, SAMS Publication.

Approved by Fifth Academic Council

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
Cos	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x	x	x	x	x	x	x	x
2	x	x		x	x	x		x	x	x	x	x
3		x	x	x	x	x	x	x	x	x	x	x
4		x		x	x	x	x	x	x	x	x	x
5	x				x				x			x

Approved by Fifth Academic Council

15ITX18 - BUILDING ENTERPRISE APPLICATIONS

L	T	P	C
3	0	0	3

OBJECTIVES:

- The aim of this paper includes designing and developing high quality enterprise applications and other task related to it.

COURSE OUTCOMES:

At the end of this elective, student shall be able to

CO1 : Familiarize with concept of Enterprise Analysis and Business Modeling.
CO2 : Understand requirements validation, planning and estimation.
CO3 : Design and document the application architecture.
CO4 : Understand the importance of application framework and designing other application components.
CO5 **:** Construct different solution layers and perform Code review, Code analysis, build process.

UNIT I **(9)**

Introduction to enterprise applications and their types, 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 **(9)**

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

UNIT III **(9)**

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 **(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 **(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 (L:45) = 45 PERIODS

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TEXT BOOKS:

1. Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu "Raising Enterprise Applications", John Wiley Publication.

2. Brett McLaughlin, "Building Java Enterprise Applications", O'Reilly Media Publication.

REFERENCE BOOKS:

1. "Software Requirements: Styles & Techniques", Addison-Wesley Professional.
2. "Software Systems Requirements Engineering: In Practice", McGraw-Hill Osborne Media.
3. "Managing Software Requirements: A Use Case Approach", Second Edition, Pearson Publication.
4. "Software Architecture: A Case Based Approach", Pearson Publication.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x	x	x		x	x		
2	x	x	x		x	x				x		
3		x		x		x		x	x	x	x	x
4	x		x	x	x	x	x		x	x	x	x
5			x		x	x			x	x	x	x

Approved by Fifth Academic Council

15ITX19 - BUSINESS INTELLIGENCE – DATA WAREHOUSING AND ANALYTICS

OBJECTIVES:

L	T	P	C
3	0	0	3

- The proposed elective course exposes engineering/management students to Business Intelligence domain. The Core Modules of this elective includes introduction to BI terminologies and framework, basics of data integration (Extraction Transformation Loading), introduction to multi-dimensional data modeling, basics of enterprise reporting and application of the concepts using open source/Microsoft tools.

COURSE OUTCOMES:

At the end of this elective, student will be able to:

CO1: Differentiate between Transaction Processing and Analytical applications and describe the need for Business Intelligence& Demonstrate understanding of technology and processes associated with Business Intelligence Framework.

CO2 : Demonstrate understanding of Data Warehouse implementation methodology and project life cycle.

CO3 : Given a business scenario, identify the metrics, indicators and make recommendations to achieve the business goal .

CO4 : Design an enterprise dashboard that depicts the key performance indicators which helps in decision making .

CO5: Demonstrate application of concepts using open source/MS Office.

UNIT I - INTRODUCTION TO BUSINESS INTELLIGENCE (9)

Introduction to digital data and its types – structured, semi-structured and unstructured, Introduction to OLTP and OLAP (MOLAP, ROLAP, HOLAP), BI Definitions & Concepts,BI Framework, Data Warehousing concepts and its role in BI, BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities, Business Applications of BI, BI best practices

UNITII - BASICS OF DATA INTEGRATION(EXTRACTION TRANSFORMATION) (9)

Concepts of data integration, needs and advantages of using data integration, introduction to common data integration approaches, Meta data – types and sources, Introduction to data quality, data profiling concepts and applications, introduction to ETL using Pentaho data Integration (formerly Kettle)

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 Microsoft Excel

UNIT IV - BASICS OF ENTERPRISE REPORTING (9)

A typical enterprise, Malcolm Baldrige - quality performance framework, balanced scorecard, enterprise dashboard, balanced scorecard vs. enterprise dashboard, enterprise reporting using MS Access / MS Excel, best practices in the design of enterprise dashboards

UNIT V - PRACTICAL EXPOSURE (9)

Project 1: Data in disparate data sources such as Excel, text file, databases etc. will be provided to the students. They will be expected to extract, cleanse, integrate and load it into the data-warehouse.

Project 2: Design reports according to given business scenarios. The data for the report s is to be pulled from the data-warehouse built in the earlier project.

Integrated Project: Extract data from various data sources, perform transformations, load into target database/spreadsheet, create a cube and pull reports on the data.

. **TOTAL (L:45) = 45 PERIODS**

Approved by Fifth Academic Council

TEXT BOOK:

1. "Fundamentals of Business Analytics" by R.N.Prasad and Seema Acharya.

REFERENCES:

1. Business Intelligence by David Loshin.
2. Business intelligence for the enterprise by Mike Biere.
3. Business intelligence roadmap by Larissa Terpeluk Moss, ShakuAtre.
4. An introduction to Building the Data Warehouse – IBM.
5. Business Intelligence For Dummies – Swain Scheps.
6. Successful Business Intelligence: Secrets to making Killer BI Applications by CindiHowson.
7. Information dashboard design by Stephen Few.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x	x	x				x	x	x
2	x	x		x	x		x		x	x		x
3	x	x	x	x	x	x				x	x	x
4	x	x			x					x		x
5	x				x	x				x	x	x

Approved by Fifth Academic Council

15ITX20 – INFORMATION SECURITY MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVES :

- Understanding of information security model, components and SDLC
- Understanding the security needs, attacks and security issues.
- Understanding of quality control and reliability.
- Understanding of security policies and protocols.
  Understanding of access control devices and analysis tools.

COURSE OUTCOMES:

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

CO 1 : Identify & prioritize threats to information assets.

CO 2 : Recognize the business need for Information Security.

CO 3 : Understand management's role in Information Security

CO 4 : Describe legal and public relations implications of security and privacy issues

CO 5 : Understand how risk is identified and assessed.

UNIT I - INTRODUCTION (9)

History. What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SLDC

UNIT II - SECURITY INVESTIGATION (9)

History. What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SLDC

UNIT III - QUALITY CONTROL AND RELIABILITY (9)

Risk Management: Identifying and Accessing Risk, Assessing and Controlling Risk

UNIT IV - LOGICAL DESIGN (9)

Blueprint for security, Information Security policy, Standards and Practices, ISO 17799/bs 7799, NIST Models, VISA International security model, Design of Security Architecture, Planning for continuity.

UNIT V - PHYSICAL DESIGN (9)

Security Technology, IDS, Scanning and Analysis Tools, Cryptograph, Access Control Devices, Physical Security, Security and Personnel.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Michael E Whitman and Herbert J Mattord, Principles of Information Security", Vikas Publishing House, New Delhi,2003.

REFERENCES:

1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management",Vol 1-3 CRC Press LLC,2004.
2. Stuart Mc Clure, Joel Scrambray,George Kurtz,"Hacking Exposed",TataMcGraw – Hill,2003.
3. Matt Bishop, " Computer Security Art and Science ", Pearson/PHI,2002.

Approved by Fifth Academic Council

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x	x	x				x	x	x
2		x		x			x		x			x
3			x	x		x				x	x	
4	x	x			x							x
5	x			x	x	x				x	x	x

Approved by Fifth Academic Council

15ITX21 - FINITE AUTOMATA

L	T	P	C
3	0	0	3

OBJECTIVE:

- To acquire the knowledge of formal languages and the concept of semantics, context free features in compiler design.

COURSE OUTCOMES:

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

CO1: Understand the concept of languages and regular expression.
CO2: Attain the knowledge of language classes & grammars relationship among them with the help of chomsky hierarchy.
CO3: Understand the design of a compiler given features of the languages.
CO4: Implement practical aspects of automata theory.
CO5: Gain knowledge of powerful compiler generation tools.

UNIT I - FORMAL LANGUAGE AND REGULAR EXPRESSIONS (9)

Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis, lex tools. Context Free grammars and parsing: Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL(1) parsing.

UNIT II - SEMANTICS (9)

Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification. Semantics: Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

UNIT III -CONTEXT SENSITIVE FEATURES (9)

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

UNIT IV - RUN TIME STORAGE (9)

Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation. Code optimization: Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

UNIT V - CODE GENERATION (9)

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

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Michael Sipser, "Introduction to Theory of computation", 3rd Edition, 2013.
2. Aho, Ullman, Ravisethi ,"Compilers Principles, Techniques and Tools", Pearson Education,2013.

REFERENCES:

1. Andrew W.Appel," Modern Compiler Construction in C "Cambridge University Press,2011.
2. LOUDEN "Compiler Construction", Thomson,2010.

Mapping of Course Outcome and Programme Outcome

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1			x	x		x	x			x		x
2	x	x			x						x	
3	x		x	x			x			x		x
4											x	x
5	x		x		x		x			x		

Approved by Fifth Academic Council

15CSX20 - ARTIFICIAL INTELLIGENCE

L	T	P	C
3	0	0	3

OBJECTIVE:

- To illustrate the basic concepts of logic and knowledge-based agents.
- To build the most basic concepts, representations and algorithms for planning, to explain the method of achieving goals.
- To introduce the most basic concepts, representations and algorithms for planning, to explain the method of achieving goals.
- To understand the basic concepts of several learning techniques.

COURSE OUTCOMES:

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

CO1 Understand the fundamentals of knowledge representation of agents.

CO2 An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.

CO3 Understand the representation of states, algorithm for planning and real world problems.

CO4 Analysis and compare the different learning process and apply to the probability theory.

CO5 Understand the different limitations of current Artificial Intelligence techniques.

UNIT I INTRODUCTION (9)

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT II KNOWLEDGE AND LOGICAL REASONING (9)

Knowledge Based Agents – Logical Agents – Propositional Logic – Inferences – First-order Logic – Inferences in First order Logic – Forward Chaining – Backward Chaining – Unification and Lifting – Resolution

UNIT III PLANNING STRATAGIES (9)

Introduction – Planning problem – Planning with State Space Search – Partial order Planning – Planning Graphs – Plan graph for Heuristic Estimation – Plan Graph Algorithm – Planning with proportional logic – Planning and Acting in the real world – Time, Schedules, and Resources.

UNIT IV UNCERTAIN KNOWLEDGE AND REASONING (9)

Uncertainty – Review of Probability - Probabilistic Reasoning – Bayesian Networks – Inferences in Bayesian Networks – Inference by Enumeration – Variable Elimination Algorithm – Temporal Models – Hidden Markov Models.

UNIT V LEARNING TECHNIQUES (9)

Learning from Observation –Forms of Learning – Ensemble Learning – Computational Learning Theory – Inductive Learning – Decision Trees – Decision Trees as Performance Elements – Expressiveness of Decision Tree – Explanation Based Learning – Statistical learning Methods –Reinforcement Learning

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. S. Russel and P. Norvig, “Artificial Intelligence – A Modern Approach”, Third Edition, Pearson Education, 2010.

REFERENCES:

1. David Poole, Alan Mackworth, Randy Goebel, ”Computational Intelligence: a logical approach”, Oxford University Press, 2004.
2. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem solving”, Fourth Edition, Pearson Education, 2002.
3. J. Nilsson, “Artificial Intelligence: A new Synthesis”, Elsevier Publishers, 1998.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x		x		x			x	
2	x	x	x	x					x		x	
3	x	x	x	x					x		x	
4	x	x	x	x					x		x	
5	x		x	x		x			x		x	

15ITX22 SOFTWARE QUALITY ASSURANCE

L	T	P	C
3	0	0	3

OBJECTIVE:

- Understand the basic tenets of software quality and quality factors.
- Be exposed to the Software Quality Assurance (SQA) architecture and the details of SQA components.
- Understand of how the SQA components can be integrated into the project life cycle.
- Be familiar with the software quality infrastructure.
- Be exposed to the management components of software quality.

COURSE OUTCOMES:

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

CO1 : Utilize the concepts in software development life cycle.
CO2 : Demonstrate their capability to adopt quality standards.
CO3 : Assess the quality of software product.
CO4 : Apply the concepts in preparing the quality plan & documents.
CO5 : Explain and construct quality-oriented software development processes

UNIT I INTRODUCTION TO SOFTWARE QUALITY & ARCHITECTURE (9)

Need for Software quality – Quality challenges – Software quality assurance (SQA) – Definition and objectives – Software quality factors- McCall's quality model – SQA system and architecture – Software Project life cycle Components – Pre project quality components – Development and quality plans.

UNIT II SQA COMPONENTS AND PROJECT LIFE CYCLE (9)

Software Development methodologies – Quality assurance activities in the development process- Verification & Validation – Reviews – Software Testing – Software Testing implementations – Quality of software maintenance – Pre-Maintenance of software quality components – Quality assurance tools – CASE tools for software quality – Software maintenance quality – Project Management.

UNIT III SOFTWARE QUALITY INFRASTRUCTURE (9)

Procedures and work instructions - Templates - Checklists – 3S developmenting - Staff training and certification Corrective and preventive actions – Configuration management – Software change control – Configuration management audit -Documentation control – Storage and retrieval.

UNIT IV SOFTWARE QUALITY MANAGEMENT & METRICS (9)

Project process control – Computerized tools - Software quality metrics – Objectives of quality measurement – Process metrics – Product metrics – Implementation – Limitations of software metrics – Cost of software quality – Classical quality cost model – Extended model – Application of Cost model.

UNIT V STANDARDS, CERTIFICATIONS & ASSESSMENTS (9)

Quality management standards – ISO 9001 and ISO 9000-3 – capability Maturity Models – CMM and CMMI assessment methodologies - Bootstrap methodology – SPICE Project – SQA project process standards – IEEE st 1012 & 1028 – Organization of Quality Assurance – Department management responsibilities – Project management responsibilities – SQA units and other actors in SQA systems.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Daniel Galin, "Software Quality Assurance", Pearson Publication, 2009.

REFERENCES:

1. Alan C. Gillies, "Software Quality: Theory and Management", International Thomson Computer Press, 1997.
2. Mordechai Ben-Menachem "Software Quality: Producing Practical Consistent Software", International Thompson Computer Press, 1997.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x		x		x				x
2		x	x		x							x
3			x	x							x	x
4		x	x		x				x		x	
5	x		x	x		x			x		x	x

15ITX23 - KNOWLEDGE MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVE:

- Learn the Evolution of Knowledge management.
- Be familiar with tools.
- Be exposed to Applications.
- Be familiar with some case studies.

COURSE OUTCOMES:

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

CO1 : Use the knowledge management tools.

CO2 : Identify technologies that are most useful for capturing/acquiring, organizing, distributing, and sharing knowledge within an enterprise.

CO3 : Develop knowledge management Applications.

CO4 : Explain how to formulate a knowledge management strategy, identify major requirements

CO5: Design and develop enterprise applications.

UNIT I INTRODUCTION (9)

Introduction: An Introduction to Knowledge Management - The foundations of knowledge management- including cultural issues- technology applications organizational concepts and processes- management aspects- and decision support systems. The Evolution of Knowledge management: From Information Management to Knowledge Management - Key Challenges Facing the Evolution of Knowledge Management - Ethics for Knowledge Management.

UNIT II CREATING THE CULTURE OF LEARNING AND KNOWLEDGE SHARING (9)

Organization and Knowledge Management - Building the Learning Organization. Knowledge Markets: Cooperation among Distributed Technical Specialists – Tacit Knowledge and Quality Assurance.

UNIT III KNOWLEDGE MANAGEMENT- THE TOOLS (9)

Telecommunications and Networks in Knowledge Management - Internet Search Engines and Knowledge Management - Information Technology in Support of Knowledge Management - Knowledge Management and Vocabulary Control - Information Mapping in Information Retrieval - Information Coding in the Internet Environment - Repackaging Information.

UNIT IV KNOWLEDGEMANAGEMENT- APPLICATION (9)

Components of a Knowledge Strategy - Case Studies (From Library to Knowledge Center, Knowledge Management in the Health Sciences, Knowledge Management in Developing Countries).

UNIT V FUTURE TRENDS AND CASE STUDIES (9)

Advanced topics and case studies in knowledge management - Development of a knowledge management map/plan that is integrated with an organization's strategic and business plan - A case study on Corporate Memories for supporting various aspects in the process life -cycles of an organization.

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Srikantaiah, T.K., Koenig, M., “Knowledge Management for the Information Professional” Information Today, Inc., 2000.

REFERENCES:

1. Nonaka, I., Takeuchi, H., “The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation”, Oxford University Press, 1995.

Approved by Fifth Academic Council

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1			x	x		x		x				
2												
3	x	x	x	x							x	
4	x	x							x		x	
5	x		x	x		x			x		x	

Approved by Fifth Academic Council

15ITX24 - ENTERPRISE RESOURCE PLANNING

L	T	P	C
3	0	0	3

OBJECTIVE:

- Organizations perceive ERP as a vital tool for organizational competition as it integrates dispersed organizational systems and enables flawless transactions and production. This course provides a better understanding of how ERP system used to achieve higher levels of integration and improve customer relationships and the supply chain's overall efficiency.

COURSE OUTCOMES:

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

CO1 : Understand the components and modules of ERP System.
CO2 : Obtain Knowledge in development and significance of ERP Systems.
CO3 : Understand the business benefits of ERP System.
CO4 : Able to identify and describe typical functionality in an ERP system.
CO5 : Understand the steps and activities in the ERP life cycle.

UNIT I INTRODUCTION (9)

ERP systems: An Introduction- Definition-Need for Enterprise Resource Planning System-Evolution of ERP-Role of ERP in business. Advanced ERP: Advanced ERP systems-SCM-CRM. ERP and E-Commerce: A concept – ERP and e-commerce Aplications.ERP Architecture: Evolution of ERP Architecture-Types of ERP Architecture.

UNIT II -ERP IMPLEMENTATION (9)

System Development Life cycle: Knowledge of Software Development – System Development Life Cycle. ERP Life Cycle :ERP implementation Life Cycle-SDLC and ERP Life Cycle. Vendors and Consultants-Data Migration Project Management-Success and Failure Factors of an ERP Implementation

UNIT III ERP AND BUSINESS PROCES REENGINERING (9)

Business Process Reengineering-Data Collection Methods. Implementation process and strategies .Related Technologies and ERP:OLAP-Data Mining Business Intelligence-Integration of Related Technologies with ERP.ERP in Action: Operation and Maintenance of the ERP System-Maximizing the ERP System

UNIT IV ERP MARKET (9)

Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software – Epicor – Intutive

UNIT V ERP PRESENT AND FUTURE (9)

Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Alexis Leon, ―ERP DemystifiedII, Tata McGraw Hill, 2 nd Edition, 2008.

REFERENCES:

1. D P Goyal,"Enterprise Resource Planning",Tata McGraw-Hill Education, 2011.
2. Mary Sumner, "Enterprise Resource Planning", Pearson Education, 2007. 3. Jim Mazzullo,"SAP R/3 for Everyone", Pearson, 2007.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x						x				x	x
2		x			x				x			
3			X				x				x	
4		x			x				x			x
5	x						x					x

15GEC03 PROFESSIONAL ETHICS AND HUMAN VALUES

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand the theory of engineering ethics.
- To enable the students to create an awareness on Engineering Ethics and Human Values.
- To instill Moral and Social Values and Loyalty and to appreciate the rights of others.

COURSE OUTCOMES:

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

CO1 Understand the concepts of ethics and values.
CO2 Acquire the knowledge of interpersonal and organizational issues in ethics
CO3 Highlight the ethical issues related to engineering.
CO4 Learn the concepts of engineer's responsibilities and their rights.
CO5 Understand the role of global issues and professional bodies.

UNIT I - HUMAN VALUES (9)

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality.

UNIT II - 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 – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT III - ENGINEERING AS SOCIAL EXPERIMENTATION (9)

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law – The Challenger case study – Bhopal Gas Tragedy and Chernobyl case studies.

UNIT IV – SAFETY, RESPONSIBILITIES AND RIGHTS (9)

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.

UNIT V - GLOBAL ISSUES (9)

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership –Code of Conduct – Corporate Social Responsibility.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOKS:

1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", 4th Edition , Tata Mc Graw Hill, New Delhi, 2014.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India Private Limited, New Delhi, 20012.

REFERENCES:

1. Charles D. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics – Concepts and Cases", Cengage Learning, 2009
3. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2008
4. http://www.slideworld.org/slidestag.aspx/human-values-and- Professional-ethics
5. www.mne.psu.edu/lamancusa/ProdDiss/Misc/ethics.ppt.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1						x		x				
2						x		x				
3						x		x	x			x
4						x		x	x			
5						x		x	x			x

15GEC04 - TOTAL QUALITY MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand total quality management concept s and principles and the various tools available to achieve total quality management, statistical approach for quality control, ISO & QS certification process and its needs for the industries.

COURSE OUTCOMES:

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

CO1 Acquire various concepts of quality management.
CO2 Implement various principles of quality management.
CO3 Impart quality using statistical process.
CO4 Use the various tools to maintain quality.
CO5 Implement the quality system for ISO certification.

UNIT I – INTRODUCTION **(9)**

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements- Quality planning - Quality councils - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality.

UNIT II - TQM PRINCIPLES **(9)**

Leadership - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal – Continuous process improvement – PDSA cycle,5S,Kaizen – Supplier Partnership – Partnering, Supplier selection - Supplier Rating.

UNIT III - TQM TOOLS AND TECHNIQUES- I **(9)**

The seven traditional tools of quality - New management tools - Six sigma: Concepts, Methodology, applications to manufacturing, service sector including IT - Bench marking - Reason to bench mark, Bench marking process - FMEA - Stages, Types.

UNIT IV - TQM TOOLS AND TECHNIQUES- II **(9)**

Control Charts - Process Capability - Concepts of Six Sigma - Quality Function Deployment (QFD) - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures.

UNIT V - QUALITY SYSTEMS **(9)**

Need for ISO 9000 - ISO 9001-2008 Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOK:

1. Dale H. Besterfiled, et at., "Total quality Management", Pearson Education Asia, Third Edition, Indian Reprint, 2011.

REFERENCES:

1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", 8th ed., First Indian Edition, Cengage Learning, 2012.
2. Subburaj Ramasamy , “Total Quality Management”, Tata McGrawHill, First reprint 2009.
3. Suganthi. L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd., 2006.
4. Janakiraman. B and Gopal .R.K., "Total Quality Management - Text and Cases", Prentice Hall (India) Pvt. Ltd., 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	X	x	X			x						
2		x	X			x						
3		x	X		x							
4		x	X		x							
5		x	X			x		x				

NANDHA ENGINEERING COLLEGE

(An Autonomous Institution affiliated to Anna University Chennai and approved by AICTE, New Delhi)
Erode-638 052, Tamilnadu, India, Phone: 04294 – 225585

List of Open Electives for

All B.E. / B.Tech. Programmes [R15]

(This Curriculum and Syllabi are applicable to Students admitted from the academic year [2015-2016] to [2016-2017])

DECEMBER 2018

Approved by Seventh Academic Council

OPEN ELECTIVES (OE)								
SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	15CEZ01	Energy conservation in buildings	OE	3	3	0	0	3
2.	15CEZ02	Waste Management	OE	3	3	0	0	3
3.	15CEZ03	Air Pollution Management	OE	3	3	0	0	3
4.	15CEZ04	Building Services	OE	3	3	0	0	3
5.	15CSZ01	Software Engineering Methodologies	OE	3	3	0	0	3
6.	15CSZ02	Design Thinking	OE	3	3	0	0	3
7.	15CSZ03	Open Source Software	OE	3	3	0	0	3
8.	15CSZ04	Information Security	OE	3	3	0	0	3
9.	15ECZ01	Avionics	OE	3	3	0	0	3
10.	15ECZ02	Consumer Electronics	OE	3	3	0	0	3
11.	15ECZ03	Modern wireless communication system	OE	3	3	0	0	3
12.	15ECZ04	Electronic Testing	OE	3	3	0	0	3
13.	15EEZ01	Renewable Energy Technology	OE	3	3	0	0	3
14.	15EEZ02	Energy Conservation and Auditing	OE	3	3	0	0	3
15.	15EEZ03	Electrical Machines	OE	3	3	0	0	3
16.	15EEZ04	Wind and Solar Electrical Systems	OE	3	3	0	0	3
17.	15EIZ01	Autotronix	OE	3	3	0	0	3
18.	15EIZ02	Fiber Optic Sensors	OE	3	3	0	0	3
19.	15EIZ03	Industrial Automation	OE	3	3	0	0	3
20.	15EIZ04	Ultrasonic Instrumentation	OE	3	3	0	0	3
21.	15ITZ01	PC Hardware and Trouble Shooting	OE	3	3	0	0	3
22.	15ITZ02	Cyber Crime Investigations and Digital Forensics	OE	3	3	0	0	3
23.	15ITZ03	Developing Mobile Apps	OE	3	3	0	0	3
24.	15ITZ04	Software Project Management	OE	3	3	0	0	3
25.	15MEZ01	Six Sigma	OE	3	3	0	0	3
26.	15MEZ02	Project Management	OE	3	3	0	0	3
27.	15MEZ03	Electric Vehicle Technology	OE	3	3	0	0	3
28.	15MEZ04	Value Engineering	OE	3	3	0	0	3
29.	15MYZ01	Mathematical Structures	OE	3	3	0	0	3
30.	15MYZ02	Optimization Techniques	OE	3	3	0	0	3
31.	15MYZ03	Statics for Engineers	OE	3	3	0	0	3
32.	15MYZ04	Statistics for Engineers	OE	3	3	0	0	3
33.	15PYZ01	Nanomaterials	OE	3	3	0	0	3
34.	15PYZ02	Nuclear physics and reactors	OE	3	3	0	0	3
35.	15PYZ03	Space science and technology	OE	3	3	0	0	3
36.	15CYZ01	Chemistry for engineers	OE	3	3	0	0	3
37.	15CYZ02	Soil chemistry	OE	3	3	0	0	3
38.	15CYZ03	Organic chemistry	OE	3	3	0	0	3

15CEZ01 ENERGY CONSERVATION IN BUILDINGS
(*Common to All branches except Civil Engineering)*

L	T	P	C
3	0	0	3

OBJECTIVE:

- To get idea on energy estimates considering about climate zones.
- To gain knowledge on energy conservation in buildings and monitoring systems

COURSE OUTCOMES:

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

CO1: Get idea on climate effects on building systems.
CO2: Perform energy estimation for buildings
CO3: Implement thermal insulation techniques in buildings.
CO4: Plan for the energy conservation methods in buildings.
CO5: Apply monitoring and control of energy systems in buildings.

UNIT I CLIMATE (6)

Climate and shelter – Historic buildings – Modern architecture – Examples from different climate zones.

UNIT II ENERGY ESTIMATION (9)

Thermal comfort – Solar geometry and shading – Heating and cooling loads – Energy estimates and site planning – Integrative Modeling methods and building simulation

UNIT III PRINCIPLES OF ENERGY (9)

Principles of Energy conscious building design – Energy conservation in buildings – Day lighting – Water heating and photovoltaic systems – Advances in thermal insulation – Heat gain / loss through building components – Solar architecture

UNIT IV ENERGY CONSERVATION (9)

Passive solar heating – Direct gain – Thermal storage wall – Sunspace – Convective air loop – Passive cooling – Ventilation – Radiation – Evaporation and Dehumidification – Mass effect – Design guidelines

UNIT V MONITORING AND CONTROL SYSTEMS (12)

Energy conservation in building – Air conditioning – HVAC equipment – Computer packages for thermal design of buildings and performance prediction – Monitoring and instrumentation of passive buildings – Control systems for energy efficient buildings – Illustrative passive buildings – Integration of emerging technologies – Intelligent building design principles.

TOTAL: L: 45 = 45 PERIODS

TEXT BOOKS:

1. J.K. Nayak and J.A. PrajapatiHadbook on Energy Consious Buildings, Solar Energy Control MNES, 2006.
2. J.A. Clarke, Energy Simulation in Building Design (2e) Butterworth 2001.

REFERENCES:

1. J.R. Williams, Passive Solar Heating, Ann Arbar Science, 1983.
2. R.W. Jones, J.D. Balcomb, C.E. Kosiewiez, G.S. Lazarus, R.D. McFarland and W.O. Wray, Passive Solar Design Hanbook, Vol.3, Report of U.S. Department of Energy (DOE/CS-0127/3), 1982.
3. M.S. Sodha, N.K., Bansal, P.K. Bansal, A.Kumar and M.A.S. Malik. Solar Passive Building, Science and Design, Pergamon Press, 1986.
4. J.L. Threlkeld, Thermal Environmental Engineering, Prentice Hall, 1970.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**Pos**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x					
2	x	x	x				x					x
3	x		x		x		x					x
4	x		x				x		x			x
5		x		x			x				X	

15CEZ02 WASTE MANAGEMENT

(*Common to All branches except Civil Engineering)*

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand of the basic principles of waste and resource management will be supplemented, where appropriate, by practical problem-solving exercises.
- To provide detailed knowledge and skills in the management, treatment, disposal and recycling options for solid wastes.
- To provide details on resource efficiency plays in conserving resources and contributing to a low carbon economy.

COURSE OUTCOMES:

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

CO1: Understand and apply the basic for solving practical waste management challenges.
CO2: Understand the collection of waste and recycling.
CO3: Understand the fundamental principles of existing and emerging technologies for the treatment of waste.
CO4: Appreciate the role of decision-making tools in the critical assessment of major waste issues.
CO5: Understand the economy and financial aspects of waste management.

UNIT I INTRODUCTION & TYPES OF SOURCES (9)

Problems and need of solid and hazardous waste management - Waste management planning - Toxicology and risk assessment - Legislations on management and handling of different types of wastes.

UNIT II WASTE GENERATION RATES (9)

Composition - Hazardous Characteristics – TCLP tests – waste sampling- reduction of wastes at source – Recycling and reuse. Handling and segregation of wastes at source – storage and collection of municipal solid wastes – Analysis of Collection systems - Need for transfer and transport – Transfer stations -labeling and handling of hazardous wastes.

UNIT III WASTE PROCESSING (9)

Processing technologies – biological and chemical conversion technologies – Composting - thermal conversion technologies - energy recovery – incineration – solidification and stabilization of hazardous wastes - treatment of biomedical wastes.

UNIT IV DISPOSAL (9)

Site selection - design and operation of sanitary landfills - secure landfills and landfill bioreactors – leachate and landfill gas management – landfill closure and environmental monitoring – landfill remediation

UNIT V ECONOMY AND FINANCIAL ASPECTS (9)

Elements of integrated waste management - Economy and financial aspects of waste management. Other Waste Types: Nuclear and Radio Active Wastes.

TOTAL: L: 45 = 45 PERIODS

TEXT BOOKS:

1. 1. Hilary Theisen and Samuel A, Vigil, George Tchobanoglous, Integrated Solid Waste Management, McGraw- Hill, New York, 1993.

REFERENCES:

1. CPHEEO, Manual on Municipal Solid waste management, Central Public Health and Environmental Engineering Organization, Government of India, New Delhi, 2000
2. Michael D. LaGrega, Philip L Buckingham, Jeffrey C. E vans and Environmental Resources Management, Hazardous waste Management, Mc-Graw Hill International edition, New York, 2001.
3. Vesilind P.A., Worrell W and Reinhart, Solid waste Engineering, Thomson Learning Inc., Singapore, 2002.
4. Charles A. Wentz, Hazardous Waste Management, Second Edition, Pub: McGraw Hill International Edition, New York, 1995.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**Pos**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x		x		x					
2			x		x		x					
3				x	x							x
4		x	x				x					
5			X		x				x		x	x

15CEZ03 AIR POLLUTION MANAGEMENT
(*Common to All branches except Civil Engineering)*

L	T	P	C
3	0	0	3

OBJECTIVE:

- To study about the characteristics and effects of air and noise pollution and the methods of controlling the same.
- To know about source inventory and control mechanism.

COURSE OUTCOMES:

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

CO1: Understand about nature and characteristics of air pollutants.
CO2: Identify the basic elements of atmosphere and its stability.
CO3: Design stacks and particulate air pollution control devices to meet applicable standards.
CO4: Understand the basic concepts of air quality management.
CO5: Identify, formulate and solve air and noise pollution problems.

UNIT I SOURCES AND EFFECTS OF AIR POLLUTANTS (9)

Classification of air pollutants – Particulates and gaseous pollutants – Sources of air pollution – Source inventory – Effects of air pollution on human beings, materials, vegetation, animals – global warming-ozone layer depletion, Sampling and Analysis – Basic Principles of Sampling – Source and ambient sampling – Analysis of pollutants – Principles.

UNIT II DISPERSION OF POLLUTANTS (9)

Elements of atmosphere – Meteorological factors – Wind roses – Lapse rate - Atmospheric stability and turbulence – Plume rise – Dispersion of pollutants – Dispersion models – Applications.

UNIT III AIR POLLUTION CONTROL (12)

Concepts of control – Principles and design of control measures – Particulates control by gravitational, centrifugal, filtration, scrubbing, electrostatic precipitation – Selection criteria for equipment - gaseous pollutant control by adsorption, absorption, condensation, combustion – Pollution control for specific major industries.

UNIT IV AIR QUALITY MANAGEMENT (8)

Air quality standards – Air quality monitoring – Preventive measures - Air pollution control efforts – Zoning – Town planning regulation of new industries – Legislation and enforcement – Environmental Impact Assessment and Air quality.

UNIT V NOISE POLLUTION (7)

Sources of noise pollution – Effects – Assessment - Standards – Control methods – Prevention.

TOTAL: L: 45 = 45 PERIODS

TEXT BOOKS:

1. Anjaneyulu, D., “Air Pollution and Control Technologies”, Allied Publishers, Mumbai, 2002.
2. Rao, C.S. Environmental Pollution Control Engineering, Wiley Eastern Ltd., New Delhi, 1996.
3. Rao M.N., and Rao H. V. N., Air Pollution Control, Tata McGraw Hill, New Delhi, 1996.

REFERENCES:

1. Heumann. W.L., "Industrial Air Pollution Control Systems", McGraw Hill, New Yark, 1997.
2. Mahajan S.P., "Pollution Control in Process Industries", Tata McGraw Hill Publishing Company, New Delhi, 1991.
3. Peavy S.W., Rowe D.R. and Tchobanoglous G. "Environmental Engineering", McGraw Hill, New Delhi, 1985.
4. Garg, S.K., “Environmental Engineering Vol. II”, Khanna Publishers, New Delhi, 1998
5. Mahajan, S.P., “Pollution Control in Process Industries”, Tata McGraw Hill, New Delhi, 1991.
6. Thod Godesh, "Air Quality, Lewis India Edition, 2013.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**Pos**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x					x					
2			x		x		x					x
3	x	x	x		x		x				x	x
4			x				x				X	
5		x	x		x						X	x

15CEZ04 BUILDING SERVICES

(*Common to All branches except Civil Engineering)*

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand about electrical systems in building and its specifications.
- To know about the concepts of refrigeration and other safety installations as per NBC
- Planning and scheduling the frequency of inspection and maintenance of building including drainage

COURSE OUTCOMES:

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

CO1: Know about the basic electrical systems in buildings
CO2: Gain knowledge about the modern lighting systems.
CO3: Study about the HVAC systems.
CO4: Be familiar with the concept of planning considerations and fire safety installation in buildings.
CO5: Study about the concepts of plumbing and drainage in building.

UNIT I ELECTRICAL SYSTEMS IN BUILDINGS (9)

Basics of electricity – Single / Three phase supply – Protective devices in electrical installations – Earthing for safety – Types of earthing – ISI specifications – Types of wires, wiring systems and their choice – Planning electrical wiring for building – Main and distribution boards – Transformers and switch gears – Layout of substations

UNIT II PRINCIPLES OF ILLUMINATION & DESIGN (9)

Visual tasks – Factors affecting visual tasks – Modern theory of light and colour –Synthesis of light – Additive and subtractive synthesis of colour – Luminous flux – Candela – Solid angle illumination – Utilisation factor – Depreciation factor – MSCP – MHCP – Lans of illumination – Classification of lighting – Artificial light sources – Spectral energy distribution – Luminous efficiency – Colour temperature – Colour rendering. Design of modern lighting – Lighting for stores, offices, schools, hospitals and house lighting. Elementary idea of special features required and minimum level of illumination required for physically handicapped and elderly in building types.

UNIT III REFRIGERATION PRINCIPLES & APPLICATIONS (9)

Thermodynamics – Heat – Temperature, measurement transfer – Change of state – Sensible heat – Latent heat of fusion, evaporation, sublimation – saturation temperature – Super heated vapour – Sub cooled liquid – Pressure temperature relationship for liquids – Refrigerants – Vapour compression cycle – Compressors – Evaporators – Refrigerant control devices – Electric motors – Starters – Air handling units – Cooling towers – Window type and packaged air-conditioners – Chilled water plant – Fan coil systems – Water piping – Cooling load – Air conditioning systems for different types of buildings – Protection against fire to be caused by A.C. Systems

UNIT IV FIRE SAFETY INSTALLATION (9)

Causes of fire in buildings – Safety regulations – NBC – Planning considerations in buildings like non-combustible materials, construction, staircases and lift lobbies, fire escapes and A.C. systems. Special features required for physically handicapped and elderly in building types – Heat and smoke detectors – Fire alarm system, snorkel ladder – Fire lighting pump and water storage – Dry and wet risers – Automatic sprinklers.

UNIT V PLUMBING AND DRAINAGE (9)

Plumbing fixtures and fixture fittings – Water conserving fittings – Over flows – Strainers and connectors – Prohibited fixtures – Special fixtures – Installation of water closet – Urinals - Flushing devices – Floor drains – Shower stall – Bath tub – Bidets – Minimum plumbing facilities – Rain water harvesting systems – Necessity – Construction – Different types .

TOTAL: L: 45 = 45 PERIODS

TEXT BOOKS:

1. Udayakumar, “A Text Book on Building Services”, Eswar Press, 2007.
2. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968.

REFERENCES:

1. E.R.Ambrose, “Heat Pumps and Electric Heating”, John and Wiley and Sons, Inc., New York, 1968.
2. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968.
3. R.G.Hopkinson and J.D.Kay, “The Lighting of buildings”, Faber and Faber, London, 1969.
4. William H.Severns and Julian R.Fellows, “Air-conditioning and Refrigeration”,John Wiley and Sons, London, 1988.
5. A.F.C. Sherratt, “Air-conditioning and Energy Conservation”, the Architectural Press, London, 1980.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and Pos												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x				x					
2			x				x					
3			x				x					x
4		x	x		x				x			
5		x	x		x		x					x

15CSZ01 SOFTWARE ENGINEERING METHODOLOGIES

(Common to All branches except CSE Branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To Understand the life cycle models of software process
- To Understand fundamental concepts of requirements engineering .
- To learn the systematic procedure for software design
- To Implement the strategies for software testing
- To explore the significance of project planning and management.

COURSE OUTCOMES:

At the end of the course, the student should be able to:

CO1: Identify the key activities in managing a software project.
CO2: Compare different process models.
CO3: Implement the Concepts of requirements engineering.
CO4: Apply systematic procedure for software design and deployment.
CO5: Compare and contrast the various testing and maintenance.

UNIT I: SOFTWARE PROCESS (9)

Introduction –Software Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation.

UNIT II: SOFTWARE REQUIREMENTS (9)

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping -Software document. Analysis and modeling – data, functional and behavioral models – structured analysis and 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 –Component level Design: Designing Class based components, traditional Components.

UNIT IV: SOFTWARE TESTING (9)

Taxonomy of software testing – levels – test activities – types of software test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large - software testing strategies - testing using extreme programming.

UNIT V: SOFTWARE 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 (L:45) = 45 PERIODS**

TEXT BOOK:

1. Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, 7th ed., Mc Graw-Hill International Edition, 2010.

REFERENCES :

1. Ian Sommerville, “Software Engineering”, 9th ed., Pearson Education Asia, 2011.
2. Rajib Mall, “Fundamentals of Software Engineering”, Third Edition, PHI COURSE Private Limited, 2009.
3. Pankaj Jalote, “Software Engineering - A Precise Approach”, Wiley India, 2010.
4. Kelkar S.A., “Software Engineering”, Prentice Hall of India Pvt Ltd, 2007.
5. Stephen R.Schach, “Software Engineering”, Tata McGraw-Hill Publishing Company.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x					x		
2		x	x		x							x
3	x	x	x	x	x				x	x		x
4	x		x	x								x
5	x	x		x	x						x	x

15CSZ02 DESIGN THINKING

(Common to All branches except CSE Branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To acquire Design Thinking skills.
- To learn by doing projects.
- To solve so called "wicked problems" (problems for which neither question nor answer is well defined).

COURSE OUTCOMES:

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

CO1: Have a sense of self-efficacy & creative confidence

CO2: Interpret and visualize the scenario..

CO3: Know how to manage a Design Thinking workshop Layout, roles, times and process.

CO4: Apply Design thinking tools to increase research output.

CO5: Do experiments by creating prototype and by obtaining feedback.

UNIT I INTRODUCTION TO DESIGN THINKING (9)

Overview - Use of Design Thinking – Design Process. Getting Started: Define Challenges – Create a Project Plan. Design Thinking Tools.

UNIT II DISCOVERY (9)

Understand the Challenge: Review the Challenge - Build your Team - Refine your Plan. Prepare Research: Identify Sources of Inspiration - Select Research Participants - Prepare For Fieldwork. Gather Inspiration: Immerse Yourself in Context - Seek Inspiration In Analogous Settings - Learn From Experts - Learn From Users.

UNIT III INTERPRETATION (9)

Tell Stories: Capture Your COURSEs- Share Inspiring Stories. Search for meaning: Find Themes - Make Sense of Findings - Define Insights. Frame Opportunities: Create a Visual Reminder - Make Insights Actionable.

UNIT IV IDEATION (9)

Generate Ideas: Prepare for Brainstorming - Facilitate Brainstorming - Select Promising Ideas - Sketch to Think. Refine Ideas - Do a Reality Check - Describe Your Idea.

UNIT V EXPERIMENTATION AND EVOLUTION (9)

Make Prototypes: Create a Prototype. Get Feedback: Identify Sources for Feedback - Select Feedback Participants - Facilitate Feedback Conversations - Capture Feedback COURSEs - Integrate Feedback. Track COURSEs: Define Success - Document Progress. Move Forward: Plan Next.

TOTAL :(L: 45) = 45 PERIODS

REFERENCES:

1. http://www.designthinkingforeducators.com/toolkit
2. https://hbr.org/2008/06/design-thinking
3. http://asimetrica.org/wp-content/uploads/2014/06/design-thinking.pdf

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x				x	x		x		
2					x							x
3	x			x	x		x	x				x
4	x		x									x
5	x	x		x	x	x	x		x	x		

13CSZ03 OPEN SOURCE SOFTWARE
(*Common to All branches except CSE Branch)*

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand the basics of open source operating systems.
- To gain the knowledge of working with Linux platform and open source database.
- To be familiar with programming languages PHP, Perl, Python.

COURSE OUTCOMES:

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

CO1: Install and run open-source operating systems.
CO2: Gather information about Free and Open Source Software projects from software releases and from sites on the internet.
CO3: Develop programs using PHP.
CO4: Solve problems using Python programming.
CO5: Develop programs using Perl.

UNIT I: INTRODUCTION **(9)**

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources –Application of pen Sources. Open source operating systems: LINUX: Introduction – General Overview – Kernel Mode and user mode – Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals –Development with Linux.

UNIT II: OPEN SOURCE DATABASE **(9)**

MySQL: Introduction – Setting up account –Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings –Date and Time – Sorting Query Results – Generating Summary – Working with metadata – Using sequences –MySQL and Web.

UNIT III: OPEN SOURCE PROGRAMMING LANGUAGES **(9)**

PHP: Introduction – Programming in web environment – variables – constants – data types – operators – Statements – Functions – Arrays – OOP –String Manipulation and regular expression – File handling and data storage – PHP and SQL database – PHP and LDAP – PHP Connectivity – Sending and receiving E-mails –Debugging and error handling – Security –Templates.

UNIT IV: PYTHON **(9)**

Syntax and Style – Python Objects – Numbers – Sequences – Strings –Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output –Errors and Exceptions – Functions – Modules – Classes and OOP –Execution Environment.

UNIT V: PERL **(9)**

Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures – Subroutines, Packages, and Modules- Working with Files –Data Manipulation.

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003.
2. Steve Suchring, “MySQL Bible”, John Wiley, 2002.

REFERENCES:

1. Rasmus Lerdorf and Levin Tatroe, "Programming PHP", O'Reilly, 2002
2. Wesley J. Chun, "Core Phython Programming", Prentice Hall, 2001
3. Martin C. Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4. Steven Holzner, "PHP: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x						x	x		x
2	x	x	x		x					x		x
3	x	x	x	x	x							x
4	x		x	x			x			x	x	x
5	x	x		x	x		x			x	x	x

15CSZ04 INFORMATION SECURITY

(*Common to All branches except CSE branch)*

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand the basics of Information Security
- To know the legal, ethical and professional issues in Information Security
- To know the aspects of risk management
- To become aware of various standards in this area
- To know the technological aspects of Information Security

COURSE OUTCOMES:

At the end of the course, the student should be able to:

CO1: Understand the basics of Information Security

CO2: Know the legal, ethical and professional issues in Information Security

CO3: Know the aspects of risk management

CO4: Become aware of various standards in this area

CO5: Know the technological aspects of Information Security

UNIT I: INTRODUCTION **(9)**

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC.

UNIT II: SECURITY INVESTIGATION **(9)**

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues.

UNIT III: SECURITY ANALYSIS **(9)**

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV: LOGICAL DESIGN **(9)**

Blueprint for Security, Information Security Poicy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V: PHYSICAL DESIGN **(9)**

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

TOTAL (L:45) = 45 PERIODS

TEXT BOOK:

1. Michael E Whitman and Herbert J Mattord, “Principles of Information Security”, Vikas Publishing House, New Delhi, 2017.

REFERENCES:

1. Micki Krause, Harold F. Tipton, “ Handbook of Information Security Management”, Vol 1-3 CRC Press LLC, 2004.
2. Stuart Mc Clure, Joel Scrambray, George Kurtz, “Hacking Exposed”, Tata McGraw Hill, 2003
3. Matt Bishop, “ Computer Security Art and Science”, Pearson/PHI, 2002.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x				x		x		x
2		x	x	x	x							x
3	x			x	x			x	x	x		x
4	x		x	x				x				x
5	x	x	x	x	x			x	x	x		x

15ECZ01 - AVIONICS

(Common to All Branches except ECE branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand the needs for avionics for both Civil and military aircraft.
- To introduce various digital electronic principles and working operations of digital circuit.
- To integrate the digital electronics with cockpit equipments.
- To understand the various principles in flight disk and cockpit panels.

COURSE OUTCOMES:

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

CO1 : Describe the hardware required for aircraft.
CO2 : Interfacing with analog and digital systems.
CO3 : Design avionics system architecture.
CO4 : Describe Civil and Military Cockpits.
CO5 : Design of flight control systems and Radar systems.

UNIT- I INTRODUCTION TO AVIONICS (9)

Need for Avionics in civil and military aircraft and space systems – Integrated Avionics system – Typical avionics sub systems – Design approaches and recent advances - Application Technologies.

UNIT- II PRINCIPLES OF DIGITAL SYSTEMS (9)

Digital Computers – Digital number system- number systems and codes-Fundamentals of logic and combinational logic circuits –Digital arithmetic – interfacing with analogue systems - Microprocessors – Memories.

UNIT- III DIGITAL AVIONICS ARCHITECTURE (9)

Avionics system architecture– salient features and applications of Data buses MIL–STD 1553 B–ARINC 429–ARINC 629.

UNIT- IV FLIGHT DECK AND COCKPITS (9)

Control and display technologies CRT, LED, LCD, EL and plasma panel - Touch screen - Direct voice input (DVI) - Civil cockpit and military cockpit : MFDS, HUD, MFK, HOTAS 63.

UNIT- V AVIONICS SYSTEMS (9)

Communication Systems - Navigation systems - Flight control systems - Radar electronic warfare - Utility systems Reliability and maintainability - Certification .

TOTAL :(L: 45) =45 PERIODS

TEXT BOOKS:

1. Middleton, D.H. “Avionics Systems”, Longman Scientific and Technical, Longman Group UK.Ltd, England, 1989.
2. Spitzer, C.R. “Digital Avionics Systems”, Prentice Hall, Englewood Cliffs, N.J., U.S.A., 1987.

REFERENCES:

1. Malcrno A.P. and Leach, D.P., “Digital Principles and Application”, Tata McGraw-Hill, 1990.
2. Gaonkar, R.S., “Microprocessors Architecture – Programming and Application”, Wiley and Sons Ltd., New Delhi, 1990.
3. Cary R .Spitzer, “The Avionics Handbook”, CRC Press, 2000.
4. Brain Kendal, “Manual of Avionics”, The English Book House, 3rd Edition, New Delhi, 1993.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x									
2	x	x		x								x
3		x	x	x								x
4		x		x	x							x
5		x	x		x							x

15ECZ02 - CONSUMER ELECTRONICS
(Common to All Branches except ECE branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To study the basics of audio and video technology.
- To understand the electronic gadgets and telecommunication systems.
- To analyze and design consumer appliances.

COURSE OUTCOMES:

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

CO1 : Know the concepts of audio system.
CO2 : Know the concepts of video system.
CO3 : Analysis different techniques involved in audio and video processing.
CO4 : Identification of new developments in office equipment and domestic appliances.
CO5 : Know the working concepts of consumer applications.

UNIT - I AUDIO SYSTEM COMPONENTS (9)

Introduction to wave motion – Interference and superposition of waves – Beats, Resonance, Echos – characteristics of microphones – types of microphone – wireless microphones – Types of headphones – Loudspeakers

UNIT-II AUDIO PROCESSING (9)

Audio Filters, Types of AGC – Loudspeaker Impedance matching – Pre-emphasis and De-emphasis noise reduction – Optical recording and reproduction – stereophony, Quadraphony – Stereo controls –Equalizers –Mixer.

UNIT - III VIDEO STANDARDS AND SYSTEMS (9)

Elements of a TV system, scanning process – resolution, interlacing, composite signal The Kell factor. LED, LCD, Types of TV camera-Color TV systems- The NTSC system-The PAL systems- The SECAM system. Broadcasting of TV programs-Digital Video Recorder and CCTV Surveillance system

UNIT - IV COMMUNICATION AND CONSUMER GADGETS (9)

Radio system – VHF and UHF – Cellular communication - Types of mobile phones – Establishing cell- Smart card– Facsimile machine – electronic calculators – Digital clocks– Xerography - TV Remote.

UNIT - V CONSUMER APPLICATIONS (9)

Washing Machines – electronic controller, fuzzy logic, Hardware and Software development – Air Conditioners – Components, Remote Controls, Unitary and central air conditioner systems – Bar Coders – Bar codes, scanner and decoder – Set Top Box – Types, firmware development, Interactive program guides.

TOTAL :(L: 45)= 45 PERIODS

TEXT BOOK:

1. S.P.Bali, Consumer Electronics, Pearson Education, 2005.

REFERENCES:

1. C.A. Schuler and W.L.Mc Namee, Modern Industrial Electronics, McGraw Hill, 2002.
2. D.J. Shanefield, Industrial Electronics for Engineers, Chemists and Technicians, Jaico Publishing House, 2007

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x					x			x
2		x			x			x		x		
3					x							x
4	x							x		x		
5	x		x		x			x		x		

15ECZ03 - MODERN WIRELESS COMMUNICATION SYSTEMS

(Common to All Branches except ECE branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To learn the comprehensive background concepts of wireless and mobile communication.
- To know the flavor of personal communication systems.
- To study the highlights of the latest communication networks and out the next generation networks.

COURSE OUTCOMES:

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

CO1 : Know the fundamentals of basic mobile communication wireless networks.

CO2 : Have a detailed overview of different networking topologies and multiple access methods.

CO3 : Have the information about the several generation of personal communication technologies

CO4 : Know about the principles of operation of the different access technologies like FDMA,TDMA, SDMA and CDMA

CO5 : Identify the different data services and short range networks used in mobile networks.

UNIT- I TRANSMISSION FUNDAMENTALS (9)

Cellphone Generations: 1G, 2G, 2.5G, 3G & 4G Transmission Fundamentals: Time domain & Frequency domain concep Carrier-based signalling, spread- spectrum signalling.

UNIT –II NETWORK CONCEPTS (9)

Communication Networks: LANs, MANs, WANs, circuit switching, packet switching, ATM Cellular Networks: Cells, duplex FDMA, TDMA, SDMA, CDMA, spectral efficiency.

UNIT- III PERSONAL COMMUNICATION SERVICES (9)

GSM, HSCSD, GPRS, D-AMPS, CDMA One, CDMA Two, Packet Data Systems.

UNIT- IV 3G & BEYOND (9)

IMT-2000, W-CDMA, CDMA 2000, EDGE, Wi-Fi, WiMAX, OFDM.

UNIT- V MOBILE DATA SERVICES & SHORT-RANGE NETWORKS (9)

Mobile Data Services: Messaging, wireless web, WAP, site design Short-Range Wireless Networks:Unlicensed spectrum phones, mobile OSs, smart phone applications.

TOTAL :(L: 45)= 45 PERIODS

TEXT BOOKS:

1. Andy Dornan, “The essential guide to wireless communications applications: from cellular systems to Wi-Fi”, 2nd Edition, Prentice Hall, 2002.
2. Misra, “Wireless Communications and Networks: 3G & Beyond”, Tata McGraw-Hill, 2013.

REFERENCES:

1. Theodore S. Rappaport, “Wireless Communications: Principles and Practice”, 2nd Edition,
2. Pearson Education, 2009.
3. William Stallings, “Wireless communications and networking”, Prentice Hall, 2005

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x									
2	x	x		x								x
3		x	x	x								x
4		x		x	x							x
5		x	x		x							x

15ECZ04 - ELECTRONIC TESTING

(Common to All Branches except ECE branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand the basics of testing and the testing equipments.
- To understand the different testing methods.
- To learn about testable system design.

COURSE OUTCOMES:

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

CO1 : Have knowledge of different types of faults and fault modeling.
CO2 : Design the different testing schemes for Digital circuits.
CO3 : Know the testing schemes for memories and mixed signal systems.
CO4 : Have knowledge of various testability design schemes.
CO5 : Diagnosis the Faults at module level.

UNIT I - INTRODUCTION **(9)**

Test process and automatic test equipment, test economics and product quality, fault modeling.

UNIT II - DIGITAL TESTING **(9)**

Logic and fault simulation, testability measures, combinational and sequential circuit test generation.

UNIT III - ANALOG TESTING **(9)**

Memory Test, DSP Based Analog and Mixed Signal Test, Model based analog and mixed signal test, delay test, IIDQ test.

UNIT IV - DESIGN FOR TESTABILITY **(9)**

Built-in self-test, Scan chain design, Random Logic BIST, Memory BIST, Boundary scan test standard, Analog test bus, Functional Microprocessor Test, Fault Dictionary, Diagnostic Tree, Testable System Design, Core Based Design and Test Wrapper Design, Test design for SOCs, Pre-Silicon to Post silicon test for FPGA.

UNIT V - LOADED BOARD TESTING **(9)**

Unpowered short circuit tests, unpowered analog tests, Powered in-circuit analog, digital and mixed Signal tests, optical and X-ray inspection procedures, functional block level design of in-circuit test Equipment

TOTAL :(L: 45) =45 PERIODS

TEXT BOOKS:

1. Michael L. Bushnell and Vishwani D. Augural, “Essentials of Electronic Testing for Digital, Memory & Mixed-Signal VLSI Circuits”, Springer, 2006.
2. Mehdi Dehbashi, Görschwin Fey “Debug Automation from Pre-Silicon to Post-Silicon” Springer, 25-Sep-2014.

REFERENCE:

1. Dimitris Gizopouilos, “Advances in Electronic Testing”, Springer 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x					x			x
2		x			x			x		x		
3					x							x
4	x							x		x		
5	x		x		x			x		x		

15EEZ01 RENEWABLE ENERGY TECHNOLOGY

L	T	P	C
3	0	0	3

(Common to All Branches except EEE branch)

OBJECTIVE:

- To emphasis the current energy status and role of renewable energy
- To know about the various concept of solar and wind energy
- To know about the various concept of biomass and other renewable energy sources

COURSE OUTCOMES:

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

CO1: Plan appropriate kind of energy for the future development.
CO2: Know about solar energy concepts, techniques and its applications.
CO3: Identify the concepts, various wind turbines, storage and environmental aspects of wind energy.
CO4: Understand the concepts of biomass energy conversion technologies and plant design considerations.
CO5: Know some other renewable energy sources.

UNIT I : INTRODUCTION (9)

World energy status, Current energy scenario in India, Environmental aspects of energy utilization, Environment-Economy - Energy and Sustainable Development, Energy planning. Reserves of Energy resources - Renewable energy resources - Potentials - Achievements - applications - Technical and social implications, issues in grid integration of power from renewable energy sources.

UNIT II : SOLAR ENERGY (9)

Basic concepts, Solar radiation – Measurement, Solar thermal systems – Flat plate and concentrating collectors, Solar passive space – Solar heating and cooling techniques – Solar desalination – Solar Pond – Solar cooker – Solar dryers – Solar furnaces – Solar pumping – Solar green house- Solar thermal electric power plant – Solar photo voltaic conversion – Solar cells – PV applications – Hybrid systems.

UNIT III : WIND ENERGY (9)

Introduction – Availability- Wind power plants, Power from the wind, Wind energy conversion systems, site characteristics – Wind turbines types – Horizontal and vertical axis – Design principles of wind turbine – Blade element theory - Magnus effect – Performance – Wind energy Applications – Hybrid systems – Wind energy storage – Safety and environmental aspects.

UNIT IV : BIOMASS ENERGY (9)

Biomass – Usable forms- composition – Fuel properties – Applications – Biomass resource – Biomass conversion technologies – Direction combustion – Pyrolysis – Gasification – Anaerobic digestion –Bioethanol and Biodiesel Production – Economics – Recent developments – Energy farming – Biogas technology – Family biogas plants – Community and institutional biogas plants – design consideration – Applications

UNIT V : OTHER RENEWABLE ENERGY SOURCES (9)

Tidal energy – Wave energy – Open and closed OTEC Cycles – Small hydro – Geothermal energy – Social and environmental aspects – Fuel cell technology: Types, principle of operation, applications –Hydrogen energy production – Storage – Transportation – Utilization.

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Godfrey Boyle, “Renewable Energy”, Power for a Sustainable Future, Oxford University Press, U.K, 1996.
2. Twidell.J.W & Weir.A, “Renewable Energy Sources”, EFN Spon Ltd., UK, 1986.
3. Tiwari.G.N, “Solar Energy - Fundamentals Design”, Modelling and applications, Narosa PublishingHouse, NewDelhi, 2002.

REFERENCES:

1. Kothari P, K C Singal and Rakesh Ranjan, “Renewable Energy Sources and Emerging Technologies”, PHI Pvt. Ltd.,New Delhi, 2008.
2. G.D. Rai, “Non Conventional Energy Sources”, Khanna Publishers, New Delhi, 1999.
3. S.P. Sukhatme, “Solar Energy”, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x					x			x
2		x			x			x		x		
3					x							x
4	x							x		x		
5	x		x		x			x		x		

15EEZ02 ENERGY CONSERVATION AND AUDITING | **L T P C**
(Common to All Branches except EEE branch) | **3 0 0 3**

OBJECTIVE:

- To enable the students to acquire the knowledge of energy conservation measures in thermal and electrical energy systems.

COURSE OUTCOMES:

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

CO1: Understand the concepts of energy status and conservation principle.
CO2: Measure the energy conservation in steam systems
CO3: Know about the energy conservation concepts of various fluid machineries
CO4: Identify electrical energy conservation in various industries
CO5: Know the energy management techniques and policies

UNIT I ENERGY CONSERVATION PRINCIPLES **(9)**

Energy scenario - Principles of energy conservation - Resource availability - Energy savings - Current energy consumption in India - Roles and responsibilities of energy managers in industries.

UNIT II ENERGY CONSERVATION IN STEAM SYSTEMS **(9)**

Power plant components - Conservation measures in steam systems, losses in boiler - Methodology of upgrading boiler performance - Blow down control, excess air control - Pressure reducing stations - Condensate recovery - Condensate pumping - Thermo compressor - Recovery of flash steam - Air removal and venting - Steam traps -Cooling towers.

UNIT III ENERGY CONSERVATION IN FLUID MACHINERY **(9)**

Centrifugal pumps - Energy consumption and energy saving potentials - Design consideration - Minimizing over design - Fans and blowers : specification, safety margin, choice of fans, controls and design considerations - Air compressor and compressed air systems: selection of compressed air layout, energy conservation aspects to be considered at design stage.

UNIT IV ELECTRICAL ENERGY CONSERVATION **(9)**

Potential areas for electrical energy conservation in various industries: conservation methods, energy management opportunities in electrical heating, lighting system, cable selection - Energy efficient motors - Factors involved in determination of motor efficiency - Adjustable AC drives - Variable speed drives - Energy efficiency in electrical system.

UNIT V ENERGY AUDITING **(9)**

Energy audit : need, preliminary audit, detailed audit, methodology and approach - Instruments for audit, monitoring energy and energy savings.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Reay.D.A, "Industrial energy conservation", Pergamon Press, 1st ed., 2003.
2. Albert Thumann, "Handbook of energy audits", 6th ed., The Fairmount Press, 2003.

REFERENCES:

1. Smith.C.B, “Energy Management Principles”, Pergamon Press, 2006.
2. Hamies, “Energy Auditing and Conservation; Methods, Measurements, Management and Case study”, Hemisphere, 2003.
3. Trivedi. P.R and Jolka .K.R, “ Energy Management”, Common Wealth Publication, 2002.

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x					x			x
2		x			x					x		
3												x
4	x											
5	x		x		x			x		x		

15EEZ03 ELECTRICAL MACHINES

(Common to All Branches except EEE branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To disseminate an overview of various electric machines used in industries, power generation and home appliances with a technical know-how on the control techniques

COURSE OUTCOMES:

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

CO1: Understand the constructional details and principle of operation of DC motors,induction machines, alternators, transformers and fractional horse-power motors

CO2: Evaluate the performance of starting and operating characteristics of various electrical machines used in industrial and domestic applications

CO3: Choose an appropriate method of speed control and braking for the drive motors

CO4: Understand the concepts of synchronous motors

CO5: Understand the manufacturing concepts in machines

UNIT I : DC MOTORS **(9)**

Construction and working principle, emf equation, torque equation, starting and running characteristics, speed control, braking, duty of operation, choice of motors.

UNIT II : TRANSFORMERS **(9)**

Construction and working principle, equivalent circuit, regulation and efficiency, autotransformers, industrial applications – welding transformer and furnace transformer.

UNIT III : THREE PHASE INDUCTION MACHINES **(9)**

Construction and working principle. Induction motors - torqueequation, torque–slip characteristics, starting and running characteristics, speed control, braking, choice of motor for industrial applications and traction.

UNIT IV : SYNCHRONOUS MACHINES **(9)**

Construction, principle of operation and types, various types of excitation systems, stand alone and grid connected modes of operation, voltage and frequency control.

UNIT V : FRACTIONAL HORSE POWER MACHINES **(9)**

Factory Automation: Flexible Manufacturing Systems concept – Automatic feeding lines, ASRS, transfer lines, automatic inspection – Computer Integrated Manufacture – CNC - Intelligent automation - Industrial networking, - Bus standards - HMI Systems - DCS and SCADA - Wireless controls.

TOTAL: 45 PERIODS

TEXTBOOKS:

1. D.P.Kothari and I.J.Nagrath, 'Electric Machines', McGraw Hill Education Private Limited, 4th ed, 2010.
2. Ashfaq Husain, 'Electric machines', Dhanpat Rai & Company, 2nd ed, 2002.

REFERENCES:

1. Gopal K. Dubey, 'Fundamentals of Electrical Drives', Narosa publishing house, 2nd ed, 2011.
2. A Fitzgerald , Charles Kingsley , Stephen Umans, 'Electric Machinery', McGraw Hill Education Private Limited, 6th ed, 2002.
3. K. Murugesh Kumar, 'Induction & Synchronous Machines', Vikas Publishing House Pvt Ltd., 2009.
4. Edward Hughes, 'Electrical and Electronic Technology', Dorling Kindersley (India) Pvt. Ltd., 10th ed, 2011.

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x					x			x
2		x			x	x	x					
3		x						x	x			
4		x			x	x		x	x			
5		x						x				

15EEZ04 WIND AND SOLAR ELECTRICAL SYSTEMS

L	T	P	C
3	0	0	3

(Common to All Branches except EEE branch)

OBJECTIVE:

- To familiarize the students with basics of solar and wind energy systems and various techniques for the conversion of solar and wind energy into electrical energy.

COURSE OUTCOMES:

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

CO1: Describe the solar radiation, measurements and characteristics of solar PV cell.
CO2: Develop the model of a PV system and its applications.
CO3: Describe the basic types and mechanical characteristics and model of wind turbine.
CO4: Analyze the electrical characteristics and operation of various wind-driven electrical generators.
CO5: Understand various power electronic converters used for hybrid system.

UNIT I INTRODUCTION TO SOLAR (9)

Basic characteristics of sunlight – solar spectrum – insolation specifics– irradiance and irradiation pyranometer – solar energy statics- Solar PV cell – I-V characteristics –P-V characteristics– fill factor- Modeling of solar cell– maximum power point tracking.

UNIT II PHOTO VOLATIC (9)

PV module – blocking diode and bypass diodes– composite characteristics of PV module – PV array– PV system –PV-powered fan–PV fan with battery backup – PV-powered pumping system – PV powered lighting systems–grid- connected PV systems.

UNIT III WIND ENERGY (9)

Wind source–wind statistics-energy in the wind –turbine power characteristics - aerodynamics – rotor types – parts of wind turbines– braking systems–tower- control and monitoring system.

UNIT IV GENERAL CHARACTERISTICS OF INDUCTION GENERATORS (9)

Grid-connected and self-excited systems – Steady state equivalent circuit - Performance predetermination – Permanent magnet alternators: steady-state performance.

UNIT V HYBRID SYSTEMS (9)

Power electronic converters for interfacing wind electric generators – Power quality issues - Wind-diesel systems – Wind-solar systems.

TOTAL = 45 PERIODS

TEXT BOOKS:

1. S N Bhadra, S Banerjee and D Kastha, 'Wind Electrical Systems', Oxford University Press, 1st Edition, 2005.
2. Chetan Singh Solanki, 'Solar Photovoltaics: Fundamentals, Technologies and Applications' PHI Learning Publications, 2nd Edition, 2011.

REFERENCES:

1. Roger A. Messenger and Jerry Ventre, "Photovoltaic Systems Engineering", Taylor and Francis Group Publications, 2nd Edition, 2003.
2. M. Godoy Simoes and Felix A. Farret, "Alternative Energy Systems: Design and Analysis with Induction Generators", CRC Press, 2nd Edition, 2008.
3. Ion Boldea, 'The Electric Generators Handbook- Variable Speed Generators', CRC Press, 2010.
4. Bin Wu, Yongqiang Lang, Navid Zargari, Samir Kouro, "Power Conversion and Control of Wind Energy Systems", IEEE Press Series on Power Engineering, John Wiley & Sons, 2011.
5. S. Sumathi,L. Ashok Kumar,P. Surekha ,'Solar PV and Wind Energy Conversion Systems', Springer 2015.

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x					x			x
2		x			x			x		x		
3					x							x
4	x							x		x		
5	x		x		x			x		x		

15EIZ01 AUTOTRONIX

(Common to ALL Branches Except EIE)

L	T	P	C
3	0	0	3

OBJECTIVE:

This course focuses on the extent and nature of electronic circuitry in automotive systems including monitoring and control circuits for engines, emission control system, ignition systems and fuel systems. The course imparts applications of sensors on automotive systems .

COURSE OUTCOMES:

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

CO1: Understand the application of electronics in automotive industry.
CO2: Identify different control systems in automotives and their control.
CO3: Design and implement various control algorithms in automotives.
CO4: Demonstrate different instrumentation systems in automotives.
CO5: Identify, formulate and solve real time engineering problems.

UNIT I FUNDAMENTALS OF AUTOMOTIVE ELECTRONICS (9)

Electronic Engine Management System – Components – Open and Closed Loop Control Strategies – PID Control – Look Up Tables – Introduction – Modern Control Strategies Like Fuzzy Logic and Adaptive Control – Controlled Parameters – SI and CI Engines.

UNIT II SENSORS AND ACTUATORS (9)

Introduction – Basic Sensor Arrangement – Types Of Sensors – Hall Effect Sensor – Hot Wire Anemometer – Thermistor – Piezo-Electric Sensor – Piezo-Resistive Sensors – Oxygen Concentration Sensor – Lambda Sensor – Crankshaft Angular Position Sensor – Cam Position Sensor – Mass Air Flow (MAF) Rate – Manifold Absolute Pressure (MAP) – Throttle Plate Angular Position – Engine Oil Pressure Sensor – Vehicle Speed Sensor – Stepper Motors – Relays – Detonation Sensor – Emission Sensors.

UNIT III SPARK IGNITION ENGINE MANAGEMENT (9)

Feedback Carburetor System – Throttle Body Injection – Multi Point Fuel Injection System – Injection System Controls –Advantage of Electronic Ignition Systems – Three Way Catalytic Converter – Conversion Efficiency Versus Lambda – Group and Sequential Injection Techniques – Fuel System Components – Advantages of Electronic Ignition Systems – Solid State Ignition Systems – Principle Of Operation – Types – Contact Less Electronic Ignition System – Electronic Spark Timing Control.

UNIT IV COMPRESSION IGNITION ENGINE MANAGEMENT (9)

Fuel Injection System – Parameters Affecting Combustion – Noise and Emissions in CI Engines – Pilot, Main, Advanced – Post Injection and Retarded Post Injection – Electronically Controlled Unit Injection System – Layout of the Common Rail Fuel Injection System – Fuel Injector – Fuel Pump – Rail Pressure Limiter – Flow Limiter – Working Principle – EGR Valve Control in Electronically Controlled Systems.

UNIT V DIGITAL ENGINE CONTROL SYSTEM (9)

Open Loop and Closed Loop Control System – Engine Cooling and Warm Up Control – Idle Speed Control – Acceleration and Full Load Enrichment – Deceleration Fuel Cut-off – Fuel Control Maps – Open Loop Control of Fuel Injection – Closed Loop Lambda Control – Exhaust Emission Control – On Board Diagnostics: Diagnostics – Future Automotive Electronic Systems.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOKS:

1. Arthur Primrose Young, Leonard Griffiths, “Automobile Electrical and Electronic Equipment: Theory and Practice for Students, Designers, Automobile Electricians and Motorists”, London Butterworths, Ninth Edition, 1986.
2. William Ribbens, “Understanding Automotive Electronics: An Engineering Perspective”, Butterworth-Heinemann, Seventh Edition, 2013.

REFERENCES:

1. Allan Bonnick, “Automotive Computer Controlled Systems” Taylor & Francis, Fifth Edition, 2001.
2. Tom Denton, “Automobile Electrical and Electronics Systems”, Butterworth- Heinemann, Fourth Edition, 2004.
3. Robert Bosch GmbH and Horst Bauer, “Gasoline-Engine Management”, Bentley Publishers, Second Edition, 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1				x			x	x				
2						x	x		x			
3	x		x	x		x	x					
4	x	x									x	
5			x	x		x	x					

15EIZ02 FIBER OPTIC SENSORS
(Common to ALL Branches Except EIE)

L	T	P	C
3	0	0	3

OBJECTIVE:

- This course introduces fundamental physical principles of both classical and modern optics as well as principles of optical design used in the engineering of optical systems.
- The course also provides exposure to practical aspects of optical materials and devices.
- The intention of the course is to provide foundation of basic principles, design methodology, and practical considerations needed to design or use optical and laser instruments in engineering practice.

COURSE OUTCOMES:

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

CO1: Understand the basic concepts of optical fibres and their properties.
CO2: Have adequate knowledge about the Industrial applications of optical fibres.
CO3: Relate and identify different types of lasers and their applications.
CO4: Demonstrate industrial applications of lasers.
CO5: Understand holography and medical applications of laser.

UNIT I OPTICAL FIBRES AND THEIR PROPERTIES (9)

Principles of light propagation through a fibre - Different types of fibres and their properties, fibre characteristics – Absorption losses – Scattering losses – Dispersion – Connectors & splicers – Fibre termination – Optical sources – Optical detectors.

UNIT II INDUSTRIAL APPLICATION OF OPTICAL FIBRES (9)

Fibre optic sensors–Fibre optic instrumentation system – Different types of modulators –Interferometric method of measurement of length – Moire fringes – Measurement of pressure, temperature, current, voltage, liquid level and strain.

UNIT III LASER FUNDAMENTALS (9)

Fundamental characteristics of lasers –Three level and four level lasers – Properties of laser – Laser modes – Resonator configuration – Q-switching and mode locking – Cavity damping – Types of lasers – Gas lasers, solid lasers, liquid lasers, semiconductor lasers.

UNIT IV INDUSTRIAL APPLICATION OF LASERS (9)

Laser for measurement of distance, length, velocity, acceleration, current, voltage and atmospheric effect – Material processing – Laser heating, welding, melting and trimming of material – Removal and vaporization.

UNIT V HOLOGRAM AND MEDICAL APPLICATIONS (9)

Holography – Basic principle - Methods – Holographic interferometry and application, Holography for non-destructive testing – Holographic components – Medical applications of lasers, laser and tissue interactive – Laser instruments for surgery, removal of tumours of vocal cards, brain surgery, plastic surgery, gynaecology and oncology.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOKS:

1. J.M. Senior, 'Optical Fibre Communication – Principles and Practice', Prentice Hall of India, 2009.
2. J. Wilson and J.F.B. Hawkes, 'Introduction to Opto Electronics', Prentice Hall of India, 2001.

REFERENCES:

1. Donald J.Sterling Jr, 'Technicians Guide to Fibre Optics', 3rd Edition, Vikas Publishing House, 2000.
2. M. Arumugam, 'Optical Fibre Communication and Sensors', Anuradha Agencies, 2002.
3. John F. Read, 'Industrial Applications of Lasers', Academic Press, 2004.
4. Monte Ross, 'Laser Applications', McGraw Hill, 2008
5. G. Keiser, 'Optical Fibre Communication', McGraw Hill, 2003.
6. Mr. Gupta, 'Fiber Optics Communication', Prentice Hall of India, 2004.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1				x			x	x				
2						x	x		x			
3	x		x	x		x	x					
4	x	x									x	
5			x	x		x	x					

Approved by Seventh Academic Council

15EIZ03 INDUSTRIAL AUTOMATION
(Common to ALL Branches Except EIE)

L	T	P	C
3	0	0	3

OBJECTIVE:

- This course produces students who can use their multidisciplinary skills to meet growing demand from an industry that is pushing the limits of technology by exploiting the growing convergence of these fields.
- The course aims to provide knowledge on fundamentals of robots, robot programming, and its vision system and apply to demonstrate their knowledge in real time application.

COURSE OUTCOMES:

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

CO1: Demonstrate the concepts of robotic principles and various robot configurations.
CO2: Develop solutions for the robot position and orientation for given application.
CO3: Identify the appropriate configuration for the application.
CO4: Design intelligence systems incorporating real time data capturing using vision systems.
CO5: Understand robotic programming and develop simple robotic systems.

UNIT I BASIC CONCEPTS (9)

Definition and origin of robotics –different types of robotics–various generations of robots –degrees of freedom – Asimov's laws of robotics – dynamic stabilization of robots.

UNIT II POWER SOURCES AND SENSORS (9)

Hydraulic, pneumatic and electric drives–determination of HP of motor and gearing ratio–variable speed arrangements –path determination –micro machines in robotics–machine vision–ranging –laser –acoustic–magnetic, fiber optic and tactile sensors.

UNIT III MANIPULATORS, ACTUATORS AND GRIPPERS (9)

Construction of manipulators–manipulator dynamics and force control–electronic and pneumatic manipulator control circuits–end effectors–U various types of grippers–design considerations.

UNIT IV KINEMATICS AND PATH PLANNING (9)

Solution of inverse kinematics problem–multiple solution jacobian work envelop–hill climbing Techniques – robot programming languages

UNIT V CASE STUDIES (9)

Mutiple robots–machine interface–robots in manufacturing and non-manufacturing applications –robot cell design–selection of robot.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOKS:

1. Industrial Robotics (SIE): Technology, Programming and Applications Nicholas Odrey, Mitchell Weiss, Mikell Groover, Roger Nagel, Ashish Dutta , Mcgrawhill, 2012.
2. Ghosh, Control in Robotics and Automation: Sensor Based Integration, Allied Publishers, Chennai, 1999.

REFERENCES:

1. S.R. Deb, Robotics technology and flexible Automation, John Wiley, USA 1992.
2. C.R. Asfahl., Robots and manufacturing Automation, John Wiley, USA 1992.
3. R.D. Klafter, T.A. Chimielewski, M. Negin, Robotic Engineering –An integrated approach, Prentice Hall of India, New Delhi, 1994.
4. P.J. Mc Kerrow, Introduction to Robotics, Addison Wesley, USA, 1991.
5. Issac Asimov I Robot, Ballantine Books, New York, 1986.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1				x			x	x				
2						x	x		x			
3	x		x	x		x	x					
4	x	x									x	
5			x	x		x	x					

15EIZ04 ULTRASONIC INSTRUMENTATION
(Common to ALL Branches Except EIE)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To know the generation and detection of ultrasonic waves and to provide knowledge on the concepts of Ultrasonic Instrumentation.

COURSE OUTCOMES:

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

CO1: Understand the applications of ultrasonic instrumentation
CO2: Characterize the ultrasonic waves
CO3: Analyze the sensors used in ultrasonic application
CO4: Apply the concepts to make simple applications
CO5: Model and analyze ultrasonic systems.

UNIT I ULTRASONIC WAVE CHARACTERISTICS (9)

Principles and propagation of various waves, Characterization of ultrasonic transmission, Reflection and Transmission coefficients, Intensity and attenuation of sound beam.

UNIT II GENERATION/DETECTION OF ULTRASONIC WAVES (9)

Magnetostrictive and piezoelectric effects, Detection of Ultrasonic Waves: Mechanical, Optical and Electrical Method, Precise Measurement: Pulse– echo Overlap, Cross correlation

UNIT III ULTRASONIC TEST METHODS (9)

Ultrasonic test methods: pulse echo, transit time, resonance, direct contact and immersion type and ultrasonic methods of flaw detection.

UNIT IV ULTRASONIC MEASUREMENTS (9)

Ultrasonic measurements: ultrasonic methods of measuring thickness, depth and flow, variables affecting ultrasonic testing in various applications.

UNIT V ULTRASONIC APPLICATIONS (9)

Ultrasonic methods of flaw detection, Flow meters, Density measurement, Viscosity measurement, Level measurement, Sensor for Temperature and Pressure measurements, Measuring thickness, Depth, Rail Inspection, SONAR, Inspection of Welds and defect detection in welds

TOTAL :(L: 45) = 45 PERIODS

TEXTBOOKS:

1. Baldev Raj, V.Rajendran, P.Palanichamy, “Science and Technology of Ultrasonics”,Alpha Science International, UK, 2004.
2. LawrenceE.Kinsler, Austin R.Frey, Alan B.Coppens, James V. Sanders, “Fundamentals of Acoustics,” John Wiley and Sons Inc,USA, 2000.

REFERENCES:

1. J.David N.Cheeke,”Fundamentals and Applications of Ultrasonic Waves,” CRC Press, Florida, 2002
2. L.A. Bulavin, YU.F.Zabashta, “Ultrasonic Diagnostics in Medicine,” VSP, Koninklijke, Brill,Boston, 2007.
3. Emmanuel P. Papadakis, “Ultrasonic Instruments and Devices”Academic Press,1999.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1				x			x	x				
2						x	x		x			
3	x		x	x		x	x					
4	x	x									x	
5			x	x		x	x					

15ITZ01 - PC HARDWARE AND TROUBLE SHOOTING

(Common to All branches except IT Branchs)

L	T	P	C
3	0	0	3

OBJECTIVE:

- This course will provide participant a much needed knowledge of computer hardware and networking, enabling them to identify and rectify the onboard computer hardware, software and network related problems.
- Upgrading of existing hardware / software as and when required. The main aspect of this program is to eliminate cost for the computer engineer boarding the vessel for troubleshoot, install / configure the application program and network related problems and there by charging exorbitant fees to ship owners / managers.

COURSE OUTCOMES:

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

CO1: Disassemble and reassemble a working computer Handle and repair

CO2 : Establish a local computer network & Load and configure a working Windows Operating System

CO3 : Make minor repairs and upgrades to a laptop computer& evaluate a computer system for individual customers, making suggestions to optimize the system for the individual

CO4 : Implement the design using Objective C and Ios

CO5 : Configure the power management features on a computer system, Troubleshoot, configure and repair printers.

UNIT I INTRODUCTION (9)

Introduction - Computer Organization – Number Systems and Codes – Memory – ALU – CU – Instruction prefetch – 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 :(L: 45) = 45 PERIODS

TEXT BOOK:

1. B. Govindarajalu, "IBM PC Clones Hardware, Troubleshooting and Maintenance", 2/E, TMH, 2002.

REFERENCES:

1. Peter Abel, Niyaz Nizamuddin, “IMB PC Assembly Language and Programming”, Pearson Education, 2007.
2. Scott Mueller, “Repairing PC's”, PHI,1992

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	
1							x	x	x		x	
2				x								
3		x							x			
4		x		x			x			x	x	
5		x	x		x		x	x			x	

15ITZ02 - CYBERCRIME INVESTIGATIONS AND DIGITAL FORENSICS

(Common to All branches except IT Branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To give knowledge of constitutional and case law to search and capture digital evidence, determine the most effective and appropriate forensic response strategies to digital evidence, and provide effective proof in a case involving digital evidence.

COURSE OUTCOMES:

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

CO1: To have various ideas about cybercrime.

CO2: To have knowledge of the various issues of cybercrime.

CO3 : To investigate and find the cybercrime.

CO4: To identify the cybercrime.

CO5: To have clear idea of the various laws and acts.

UNIT I INTRODUCTION **(9)**

Introduction and Overview of Cyber Crime - Nature and Scope of Cyber Crime - Types of Cyber Crime: Social Engineering - Categories of Cyber Crime - Property Cyber Crime.

UNIT II CYBER CRIME ISSUE **(9)**

Unauthorized Access to Computers - Computer Intrusions - White collar Crimes - Viruses and Malicious Code - Internet Hacking and Cracking - Virus Attacks – Software Piracy - Intellectual Property - Mail Bombs - Exploitation - Stalking and Obscenity in Internet - Digital laws and legislation - Law Enforcement Roles and Responses.

UNIT III INVESTIGATION **(9)**

Introduction to Cyber Crime Investigation - Investigation Tools – Discovery - Digital Evidence Collection - Evidence Preservation - E-Mail Investigation – Tracking - IP Tracking - E-Mail Recovery - Hands on Case Studies - Encryption and Decryption Methods - Search and Seizure of Computers - Recovering Deleted Evidences - Password Cracking.

UNIT IV DIGITAL FORENSICS **(9)**

Introduction to Digital Forensics - Forensic Software and Hardware - Analysis and Advanced Tools - Forensic Technology and Practices - Forensic Ballistics and Photography - Face, Iris and Fingerprint Recognition - Audio Video Analysis - Windows System Forensics - Linux System Forensics - Network Forensics.

UNIT V LAWS AND ACTS **(9)**

Laws and Ethics - Digital Evidence Controls - Evidence Handling Procedures - Basics of Indian Evidence ACT IPC and CrPC - Electronic Communication Privacy ACT - Legal Policies.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOKS:

1. Nelson Phillips and Enfinger Steuart, —Computer Forensics and Investigationsll, Cengage Learning, New Delhi, 2009.
2. Kevin Mandia, Chris Prosise, Matt Pepe, —Incident Response and Computer Forensics —Tata McGraw - Hill, New Delhi, 2006.

REFERENCES:

1. Robert M Slade, Software Forensics , Tata McGraw Hill, New Delhi, 2005.
2. Bernadette H Schell, Clemens Martin, —Cybercrime, ABC – CLIO Inc, California, 2004.
3.Understanding Forensics in IT — NIIT Ltd, 2005.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	
1							x	x	x			
2				x			x		x			
3						x			x			
4				x		x				x	x	
5			x		x		x	x			x	

15ITZ03 - DEVELOPING MOBILE APPS

(Common to All branches except IT Branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- Understand system requirements for mobile applications.
- Generate suitable design using specific mobile development frameworks.
- Generate mobile application design.
- Implement the design using specific mobile development frameworks.
- Deploy the mobile applications in marketplace for distribution.

.

COURSE OUTCOMES:

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

CO1: Describe the requirements for mobile applications

CO2: Explain the challenges in mobile application design and development

CO3: Implement the design using Android SDK

CO4: Implement the design using Objective C and iOS

CO5: Deploy mobile applications in Android and iPone marketplace for distribution

UNIT I INTRODUCTION **(9)**

Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications – Requirements gathering and validation for mobile applications.

UNIT II BASIC DESIGN **(9)**

Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – User interfaces for mobile applications – touch events and gestures – Achieving quality constraints – performance, usability, security, availability and modifiability.

UNIT III ADVANCED DESIGN **(9)**

Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

UNIT IV TECHNOLOGY I - ANDROID **(9)**

Introduction – Establishing the development environment – Android architecture – Activities and views – Interacting with UI – Persisting data using SQLite – Packaging and deployment – Interaction with server side applications – Using Google Maps, GPS and Wifi – Integration with social media applications.

UNIT V TECHNOLOGY II - IOS **(9)**

Introduction to Objective C – iOS features – UI implementation – Touch frameworks – Data persistence using Core Data and SQLite – Location aware applications using Core Location and Map Kit – Integrating calendar and address book with social media application – Using Wifi - iPhone marketplace.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOKS:

1. http://developer.android.com/develop/index.html.

2. Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012

REFERENCES:

1. Charlie Collins, Michael Galpin and Matthias Kappler, “Android in Practice”, DreamTech,2012
2. James Dovey and Ash Furrow, “Beginning Objective C”, Apress, 2012
3. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS 6 Development: Exploring the iOS SDK”, Apress, 2013.

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Mapping of COs and POs												
COs	**POs**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	
1								x				
2					x		x					
3		x				x			x			
4				x		x		x		x	x	
5			x		x		x	x			x	

15ITZ04 - SOFTWARE PROJECT MANAGEMENT

(Common to All branches except IT Branch)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To plan and manage projects at each stage of the software development life cycle (SDLC).
- To train software project managers and other individuals involved in software project planning and tracking and oversight in the implementation of the software project management process.
- To understand successful software projects that support organization's strategic goals.

.

COURSE OUTCOMES:

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

CO1: Evaluate and select the most desirable projects & Identify desirable characteristics of effective project managers.

CO2: Apply appropriate approaches to plan a new project.

CO3: Apply appropriate methodologies to develop a project schedule.

CO4: Develop a suitable budget for a new project & Identify important risks facing a new project.

UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT (9)

Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II PROJECT EVALUATION (9)

Strategic Assessment – Technical Assessment – Cost Benefit Analysis –Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

UNIT III ACTIVITY PLANNING (9)

Objectives – Project Schedule – Sequencing and Scheduling Activities –NetworkPlanning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning And Control.

UNIT IV MONITORING AND CONTROL (9)

Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Priortizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNIT V MANAGING PEOPLE AND ORGANIZING TEAMS (9)

Introduction – Understanding Behavior – Organizational Behaviour: A Background –Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation– The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team –Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies.

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOK:

1. Bob Hughes, Mikecotterell, “Software Project Management”, Third Edition, Tata McGraw Hill, 2004.

REFERENCES:

1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, “Software Project Management”, Pearson Education, 1999.
3. Jalote, “Software Project Management in Practice”, Pearson Education, 2002.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	
1	x							x	x			
2			x				x					
3		x				x			x			
4	x			x				x		x	x	
5			x		x		x	x			x	

Approved by Seventh Academic Council

15MEZ01 SIX SIGMA

(Common to All Branches except Mechanical Engineering)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To introduce the techniques and phases of six sigma
- To acquire knowledge on design for six sigma during product development stage
- To introduce the lean concepts in service sectors

COURSE OUTCOMES:

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

CO1: Formulate the six sigma project definition for process improvement in an industry
CO2: Summarize the stages in preparation of technical requirements and team formation
CO3: Create a project definition document and/or assess the process condition through collected data
CO4: Apply the six sigma tools the analyze the process parameters and/or identify the scope for process improvement
CO5: Recommend a system to sustain the results and/or list the tools in design for six sigma and lean servicing

UNIT I : INTRODUCTION **(9)**

Overview of Six Sigma and Lean Manufacturing - 6 sigma, TQM & MBNQA - common terms - organizational success factors - leadership, strategic initiative - internal communication - launching of 6 sigma - organizational structure - six sigma training plan - project selection - assessing organizational readiness - common pitfalls - work as a process - vertical functions and horizontal processes.

UNIT II : PREPARATION PHASE **(9)**

Voice of the customer - importance, identify the customer, collect VOC data, Critical-to-Quality customer requirements - project management - challenges - project culture - project management processes - team typing-team stages - understanding team dynamics - forming, storming, norming, performing, characteristics of effective teams.

UNIT III : DEFINE AND MEASURE PHASE **(9)**

DMAIC Phases - define phase overview - project charter - voice of the customer - high level process map - project team - measure phase overview - statistical methods - normal distribution - Population Parameters Vs Sample Statistics - sampling plan - data collection plan - choosing statistical software - measure tools - measurements - cost of poor quality - probability distributions - measurement system analysis - Process Capability.

UNIT IV: ANALYZE AND IMPROVE PHASE **(9)**

Overview - process analysis - hypothesis testing - statistical tests and tables - tools for analyzing relationships among variables - survival analysis - improve phase overview - process redesign - generating improvement alternatives - design of experiments - pilot experiments - Cost/Benefit Analysis - implementation plan - card one case study improve phase results.

UNIT V : CONTROL PHASE, DESIGN FOR SIX SIGMA AND LEAN SERVICING **(9)**

Control phase overview - control plan - process scorecard - failure mode and effects analysis - SPC Charts - final project report and documentation - design for six sigma overview - DFSS Tools - Quality Function Deployment - TRIZ - Lean Production Overview - lean servicing concepts - getting started with lean - continuous flow production.

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. Michael L George, David T Rowlands, and Bill Kastle, “What is Lean Six Sigma”, McGraw Hill, New York, 2004
2. Betsi Harris Ehrlich, “Transactional Six Sigma and Lean Servicing”, St. Lucie Press, 2002.

REFERENCES:

1. Kai Yang and Basem El Haik, “Design for Six Sigma”, McGraw Hill, New York, 2004
2. Thomas Pyzdek, “Six Sigma Handbook: Complete Guide for Green belts, Black belts and Managers at All Levels”, Tata McGraw Hill Companies Inc, 2003
3. Donald W Benbow and Kubiak T M, “Certified Six Sigma Black Belt Handbook”, Pearson Education, 2007
4. Urdhwarashe, “Six Sigma for Business Excellence”, 1st ed., Pearson Education India, 2010
5. Gopalakrishnan. N, “Simplified Six Sigma: Methodology, Tools and Implementation, Prentice Hall India, 2012.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x						x			x
2	x	x	x		x		x		x		x	x
3	x	x	x		x		x		x		x	x
4	x	x	x	x	x		x		x		x	x
5	x	x	x	x	x		x		x		x	x

15MEZ02 PROJECT MANAGEMENT
(Common to All Branches except Mechanical Engineering)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To gain knowledge about project, project management and its basics
- To know stages of project management in an organization
- To understand the roles and responsibilities of a project manager

COURSE OUTCOMES:

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

CO1: Demonstrate the skill set of a project manager
CO2: Develop skills in managing project works by effective team building
CO3: Strategize proper plan and premeditate the risks related to projects
CO4: Phase the project work as various stages and develop skills to control the project
CO5: Apply project management concepts by identifying and carrying out a real time project

UNIT I : PROJECTS, PROJECT MANAGEMENT AND PROJECT MANAGER (9)

Project Management - process context - interpersonal and behavioral context - organizational context - defining project success - responsibilities of project manager - common challenges expected to face - skill requirements and functional competencies - unofficial job duties - value of introspection and self-awareness to the soft side

UNIT II : PROJECT DEFINITION, EFFECTIVE TEAM BUILDING (9)

Evolution of projects - understanding the problem - identification of optimum solution - development of solution and preliminary plan - formal launching of project - evaluation of political environment - mechanics of building a team - team leadership - fostering teamwork and synergism - getting the most from team members

UNIT III : PROJECT PLANNING, RISK AND UNCERTAINTY (9)

Project Planning - estimating - scope management - time management - cost management - project management software - understanding risk and uncertainty - managing risk - identifying what can hurt you - quantifying how badly you can get hurt - analyzing the biggest threats - responding to high-threat problems - accommodating uncertainty

UNIT IV: PROJECT CONTROL AND INTERFACES (9)

Project Control - Establishing a Baseline of Measurement - Information Needs - Information Gathering - ensuring Good Information - Analyzing the Information - Reacting to the Information - Project Interfaces - Roles of Internal Stakeholders and External Stakeholders - Other Interfaces - Considerations in Interface Management

UNIT V : PROJECT COMMUNICATION, DOCUMENTATION AND CONCLUSION (9)

Configuration plan - documentation and communication road map - methods of communicating - guidelines for effective communication - conducting high quality meetings - communication skills - key project documentation - early termination - key elements in project closure - punch list approach - project completion checklist

TOTAL (L:45) : 45 PERIODS

TEXTBOOKS:

1. Gary R. Heerkens, "Project Management", 2nd ed., McGraw-Hill Book Company, 2013

REFERENCES:

1. Harold Kerzner, "Project Management", 12th ed., John Wiley & Sons, 2017
2. John M Nicholas, Herman Steyn, "Project Management for Engineering, Business and Technology", 5th ed., Taylor&Francis, 2016
3. Prasanna Chandra, "Projects : Planning, Analysis, Selecting, Financing, Implementation and Review", 8th ed., McGraw Hill Education, 2017
4. Eric W Larson and Clifford F Gray, Gautam V Desai, "Project Management: The Managerial Process", 6thed., McGraw Hill Education, 2017

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x			x			x			x
2	x		x		x		x		x		x	x
3	x		x		x		x		x		x	x
4	x	x	x	x	x		x		x		x	x
5	x	x	x	x	x		x		x		x	x

15MEZ03 ELECTRIC VEHICLE TECHNOLOGY

(Common to All Branches except Mechanical Engineering)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To introduce the working principles of batteries and their types
- To acquire knowledge on applications of alternative energy sources in vehicles
- To introduce the electrical drives, mathematical modeling and design considerations

COURSE OUTCOMES:

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

CO1: Differentiate the types of batteries which are used in electrical vehicles
CO2: List the types of alternative energy sources and/or working principles of fuel cells
CO3: Assess the potential of hydrogen energy in vehicles and energy storage techniques
CO4: Recommend an electrical drive and its controller in vehicular applications
CO5: Explain the concepts of electric vehicle modeling and design aspects

UNIT I : INTRODUCTION AND BATTERIES (9)

Types of electric vehicle - battery parameters - lead acid batteries - nickel based batteries - battery charging - designer‟s choice of battery - use of batteries in hybrid vehicles - battery modelling.

UNIT II : ALTERNATIVE ENERGY SOURCES AND FUEL CELLS (9)

Solar photovoltaics - wind power - flywheels - super capacitors - supply rails - hydrogen fuel cells - fuel cell thermodynamics - connecting cells in series - water and thermal management in PEM fuel cell.

UNIT III : HYDROGEN SUPPLY AND STORAGE (9)

Introduction - fuel reforming - fuel cell requirements, steam reforming, partial oxidation and autothermal reforming, further fuel processing, mobile applications - storage as hydrogen - chemical methods.

UNIT IV: ELECTRIC MACHINES AND CONTROLLERS (9)

Brushed DC electric motor - DC regulation and voltage conversion - brushless electric motors - motor cooling, efficiency, size and mass - electrical machines for hybrid vehicles.

UNIT V : ELECTRIC VEHICLE MODELLING AND DESIGN CONSIDERATIONS (9)

Introduction - tractive effort - modelling vehicle acceleration and electric vehicle range - simulations - aerodynamic considerations - rolling resistance - transmission efficiency - vehicle mass - general issues

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. James Larminie, John Lowry, “Electric Vehicle Technology Explained”, John Wiley & Sons Ltd., 2015
2. Iqbal Husain, “Electric and Hybrid Vehicles”, 2nd ed., CRC Press, 2010.

REFERENCES:

1. Mehrdad Ehsani, Yimin Gao, Ali Emadi, “Modern Electric, Hybrid Electric, and Fuel Cell Vehicles”, 2nd ed., CRC Press 2009
2. Chau.K.T, “Electric vehicle machines and drives”, Wiley-IEEE Press, 2015
3. James D Halderman, “Hybrid and Alternative Fuel Vehicles”, 3rd Revised edition, Pearson Education, 2012
4. Jingyu Yan , Huihuan Qian , Yangsheng Xu, “Hybrid Electric Vehicle Design and Control”, McGraw-Hill Professional Publishing, 2013
5. Chris Mi; M. Abul Masrur and David Wenzhong Gao, “Hybrid Electric Vehicles”, John Wiley & Sons, 2011

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x		x		x				x	x
2	x		x		x		x				x	x
3	x		x		x		x				x	x
4	x		x		x		x				x	x
5	x		x		x		x				x	x

15MEZ04 VALUE ENGINEERING

(Common to All Branches except Mechanical Engineering)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To introduce the concept of value engineering for eliminating the unnecessary costs of a product
- To acquire knowledge on various value engineering techniques, team dynamics and job plan
- To introduce the financial aspects and human factors of value engineering

COURSE OUTCOMES:

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

CO1: Estimate the value of a product and/or identify the primary and secondary functions of a product
CO2: Determine the cost, worth of a product and their elements
CO3: Demonstrate the value engineering techniques for industrial applications
CO4: Summarize the stages in team dynamics and value engineering job plan
CO5: Illustrate the financial aspects and human factors of value engineering

UNIT I : VALUE AND FUNCTION (9)

Seven types values - economic value - cost, use, esteem and exchange values - mathematical model of value - types and levels of functions - function identification - method of finding functions of a product - case study - vocabulary of verbs and nouns.

UNIT II : COST AND WORTH (9)

Cost and price - elements of cost - direct material, direct labour, direct expenses, overheads - calculation of cost - case study - method of determining function cost - evaluation of worth - guidelines to find out worth - value gap and value index.

UNIT III : VALUE ENGINEERING TECHNIQUES (9)

Brainstorming and Gordon techniques - feasibility ranking - morphological analysis technique - ABC analysis - probabilistic approach - make or buy - function-cost-worth analysis - FAST - weighted evaluation method - evaluation matrix - life cycle cost.

UNIT IV: TEAM DYNAMICS AND JOB PLAN (9)

Team structure - team building - physical, intellectual, spiritual transformations - job plan - orientation phase - information phase - function phase - creative phase - evaluation phase - recommendation phase - implementation phase - audit phase.

UNIT V : FINANCIAL ASPECTS AND HUMAN RELATION (9)

Break-even point - payback period - return on investment - discounted cash flows - balance sheet and profit and loss account - human aspects in value engineering - individual ego states - techniques of transactions - human interactions - Managerial grid

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. Mukhophadhyaya A K, "Value Engineering", Sage Publications Pvt. Ltd., New Delhi, 2003
2. Mukhophadhyaya A K, "Value Engineering Mastermind", Sage Publications Pvt. Ltd., New Delhi, 2009

REFERENCES:

1. Richard J Park, "Value Engineering - A plan for inventions", St.Lucie Press, London, 1998.
2. Iyer. S. S, "Value Engineering: A How to Manual", 3rd ed., New age publishers, 2009
3. Larry W Zimmesman. P E , "VE - A Practical approach for owners designers and contractors", 1st ed., CBS Publishers, Delhi, 1992
4. Theodore C. Fowler, "Value Analysis in Design", John Wiley & Sons, 1997
5. Arthus E Mudge, "Value Engineering", McGraw Hill book company, 1971

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x			x				x			x
2	x	x			x				x		x	x
3	x	x			x				x		x	x
4	x	x			x				x		x	x
5	x	x			x				x		x	x

15MYZ01- MATHEMATICAL STRUCTURES

(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand the basic concepts of logic and their applications.
- To give you a familiarity with rigour and a grounding in the art of formal reasoning.
- To understand the concepts of sets and relations.
- To understand basic concepts of functions.
- To understand the characteristic of a group and the coset

.

COURSE OUTCOMES:

At the end of this course, the students would know

CO1 : To extend the logical and mathematical ability to deal with abstraction.
CO2 : Be aware of counting principle
CO3 : Exposed to concepts and properties of set theory
CO4 : Identify and analyze the basic proofs involving functions.:
CO5 : Be exposed to concepts and properties of algebraic structures such as Semi groups

UNIT I - PROPOSITIONAL CALCULUS **(9)**

Propositions - Logical connectives-Compound propositions - Conditional and biconditional propositions - Truth tables - Tautologies and Contradictions - Logical and Equivalences and implications - DeMorgan's Laws - Normal forms

UNIT II – PREDICATE CALCULUS **(9)**

Predicates - Statement Function – Variables - free and bound variables – Quantifiers - Universe of discourse -Logical equivalences and implications for quantified statements

.

UNIT III – SET THEORY **(9)**

Cartesian product of sets- Relations of sets-Types of relations and their properties – Relational matrix and the graph of a relation- Equivalence relations – Partial ordering – Poset – Hasse diagram.

UNIT IV – FUNCTIONS **(9)**

Definition – Classification of functions – Composition of functions – Inverse functions – Binary and n-ary operations – Characteristic function of a set..

.

UNIT V – ALGEBRAIC STRUCTURES **(9)**

Algebraic systems - Semi groups and monoids - Groups – Subgroups - Homomorphisms – Normal subgroup and coset – Lagrange's theorem..

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. **Tremblay J.P and Manohar R**, "Discrete Mathematical Structures with Applications to Computer Science" ,Tata McGraw-HILL, New Delhi, ,30th Reprint 2011.
2. **Veerarajan.T,** "Discrete Mathematics with Graph Theory and Combinatorics", Fourth Edition, Tata McGraw Hill , New Delhi, Reprint 2013.

REFERENCES:

1. **Kenneth H.Rosen**, "Discrete Mathematics and its Applications", Fifth Edition, Tata McGraw- Hill publications, New Delhi 2012.
2. **Venkatraman M.K.,** "Discrete Mathematics", The National Publishing Company, Chennai,2007.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x									
2	x	x		x								x
3	x		x				x					
4	x	x					x		x			
5	x	x	x								x	

Approved by Seventh Academic Council

15MYZ02- OPTIMIZATION TECHNIQUES

(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To provide the concept and an understanding of basic concepts in Operations Research.
- To understand, develop and solve mathematical model of Transport and assignment problems.
- To understand, develop and solve mathematical model of linear programming problems.
- To provide Techniques for Analysis and Modeling in Computer Applications.
- To understand network modeling for planning and scheduling the project activities

COURSE OUTCOMES:

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

CO1 : Construct and solve linear programming models to answer business optimization
CO2 : Apply transportation and assignment models to find optimal solution in warehousing and Travelling.
CO3 : Prepare project scheduling using PERT and CPM.
CO4 : Appraise theoretical predictions obtained from Game Theory analyses against real world conflicts.
CO5 : Identify and analyze appropriate queuing model to reduce the waiting time in queue

.

UNIT I - LINEAR PROGRAMMING MODELS **(9)**

Mathematical Formulation - Graphical Solution of Linear Programming Models - Simplex Method - Big-M Method

UNIT II – TRANSPORTATION AND ASSIGNMENT MODELS **(9)**

Mathematical Formulation of Transportation Problem - Methods for Finding Initial Basic Feasible Solution: North West Corner Rule, Least Cost Method, VAM - Optimum solution – Mathematical Formulation of Assignment Models.

UNIT III – PERT AND CPM **(9)**

Network Construction – Critical Path Method – Project Evaluation and Review Technique

UNIT IV– GAME THEORY **(9)**

Definition - Pay-off - Two Person Zero - Sum Games -The Maximin - Minimax Principle - Games without Saddle Points (Mixed Strategies) - 2x2 Games without Saddle Points - Graphical Method for 2xn or mx2 Games.

UNIT V – QUEUING MODELS **(9)**

Characteristics of Queuing Models – Poisson Queues – (M/M/1): (FIFO/∞/∞), (M/M/1): (FIFO/N/∞), (M/M/C): (FIFO/∞/∞), (M/M/C) : (FIFO/N/∞) Models.

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. Taha, H.A. “Operations Research: An Introduction”, 8th Edition, Pearson Education, 2008.
2. V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan, ”Resource Management Techniques”, A.R.Publication, 2002.

REFERENCES:

1. A .M. Natarajan, P. Balasubramani, A.Tamilarasi, “Operations Research” , Pearson Education, Asia, 2005.
2. Prem Kumar Gupta , D.S. Hira “Operations Research”, S. Chand & Company Ltd., New Delhi, Third Edition, 2003.
3. Manmohan .,Kandi swarp.,Gupta., “Operations Research”,Sultan Chand & Sons(first edition),New delhi.”.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x								x
2	x	x					x		x		x	x
3	x	x	x			x					x	
4	x		x								x	x
5	x								x		x	x

15MYZ03- STATICS FOR ENGINEERS
(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To Aware knowledge of parallel forces
- To know the concept of equilibrium of forces.
- To acquire the knowledge of moments and couples.
- To know resultant of co-planar forces acting on a rigid body.
- To learn the necessary and sufficient conditions of equilibrium.
-

COURSE OUTCOMES:

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

CO1 : Knowledge about different types of forces and their resultant
CO2 : To bring the polygon of forces to be in equilibrium.
CO3 : Moments and couples of parallel forces.
CO4 : To know about co-planar forces.
CO5 : Necessary and sufficient conditions to bring the equilibrium of forces.

UNIT I - TYPES OF FORCES **(9)**

Forces acting at a point – Parallelogram law – triangle law

UNIT II – EQUILIBRIUM OF FORCES **(9)**

(λ, μ) theorem – Polygon of forces – conditions of equilibrium.

UNIT III – MOMENTS AND COUPLES **(9)**

Parallel forces – Moments and couples composition of parallel forces (like and unlike).

UNIT IV – CO-PLANAR FORCES **(9)**

Moment of a force about a point – Varignons theorem – Co-planar forces acting on a rigid body – Theorem on three co-planar forces in equilibrium

UNIT V – REDUCTION OF A SYSTEM OF CO-PLANAR FORCES **(9)**

Reduction of a system of co-planar forces to a single force and a couple – necessary and sufficient conditions of equilibrium only – Equation to the line of action of the resultant.

TOTAL (L:45) : 45 PERIODS

TEXT BOOK:

1. M.K.Venkataraman, Statics, Agasthiar Publications, Trichy, 1999

REFERENCES :

1. A.V.Dharmapadam, Statics, S.Viswanathan Printers and Publishing Pvt., Ltd, 1993.

2 P.Duraipandian and Laxmi Duraipandian, Mechanics, S.Chand and Company Ltd, Ram Nagar, New Delhi-55,

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x		x			x		x	
2	x	x	x	x		x			x		x	
3	x	x	x	x		x			x		x	
4	x	x	x	x		x			x		x	
5	x	x	x	x		x			x		x	

15MYZ04- STATISTICS FOR ENGINEERS
(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To assess the validity of statistical conclusions.
- To determine the outcomes and probabilities for experiments.
- To Understand how to develop Null and Alternative Hypotheses
- To understand difference between Parametric and Nonparametric Statistical Procedures.
- To estimate the relationships among variables

COURSE OUTCOMES:

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

CO1 : The fundamental knowledge of basic statistics and probability distribution concepts.
CO2 : Empirical distribution of sample means is closer to bell shaped when the size of the sample increases.
CO3 : The knowledge of test of Hypothesis as well as to calculate confidence limits for a given population parameter for single sample and two sample cases.
CO4 : Various methods of non parametric tests and concepts related to the testing of hypothesis.
CO5 : The application of correlation, regression and time series analysis in various aspects.

UNIT I INTRODUCTION TO STATISTICS **(9)**

Statistics – Definition, Types. Types of variables – Organizing data – Descriptive Measures: Mean, Median, Mode, Standard Deviation, Mean Deviation.

UNIT II INTRODUCTION TO PROBABILITY **(9)**

Basic definitions and rules for probability - conditional probability - independence of events - Probability distributions: Binomial, Poisson and Normal distributions.

UNIT III TESTING OF HYPOTHESIS **(9)**

Hypothesis testing: one sample and two sample tests for means and proportions of large samples(z-test), one sample and two sample tests for means of small samples (t-test), F-test for two sample standard deviations. ANOVA one way and two ways.

UNIT IV NON-PARAMETRIC METHODS **(9)**

Chi-square test for single sample standard deviation. Chi-square tests for independence of attributes and goodness of fit. Rank sum test. Kolmogorov – Smirnov – test for goodness of fit, comparing two populations. Mann – Whitney U test and Kruskal Wallis test.

UNIT V CORRELATION, REGRESSION AND TIME SERIES ANALYSIS **(9)**

Correlation analysis, estimation of regression line. Time series analysis: variations in time series, Trend analysis, Cyclical variations, seasonal variations and irregular variations (Self-study).

TOTAL :(L: 45) = 45 PERIODS

TEXT BOOKS:

1. Richard I.Levin, David S.Rubin, Statistics for Management, 7th Ed, 2011.
2. Aczel A.D. and Sounderpandian J., Complete Business Statistics 6th edition, Tata McGraw – Hill, Publishing company Ltd, New Delhi, 2012.

REFERENCES:

1. Srivatsava TN and Shailaja rego, Statistics for Management Tata McGraw Hill, 2008.
2. Ken Black, Business Statistics, 6th Ed., Wiley India Edition, 2009.
3. Anderson D.R. Sweeney D.J. and Williams T.A., Statistics for business and economics, 9th edition, Thomson (South- Western) Asia, Singapore, 2012.
4. N.D.Vohra, Business Statistics, Tata McGraw Hill, 2012.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x					x		x	
2	x	x	x		x	x	x			x	x	
3	x	x	x			x	x				x	
4	x	x	x	x					x	x	x	
5	x	x	x		x	x					x	

15PYZ01- NANOMATERIALS
(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To provide basic knowledge about nanomaterials
- To understand the properties of nanomaterials and the mechanisms used in characterization
- To provide in-depth knowledge in characterization of nanomaterials in engineering and biology.
- To provide knowledge various testing mechanisms adopted for nanomaterials
- To understand the ways of full utilization of nanomaterials in various fields

COURSE OUTCOMES:

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

CO1 : Acquire knowledge of basics of nanomaterials
CO2 : Understand the peculiar properties of nanomaterials
CO3 : Know the various microscopy techniques involved in analysis of nanomaterials
CO4 : Understand the synthesis of different types of nanomaterials
CO5 : Appreciate the application of nanomaterials in engineering and biology

UNIT I - FUNDAMENTAL PRINCIPLES OF NANOMATERIALS **(9)**

Size & scale, units, scaling Laws, atoms, molecules & clusters, super molecules, nanoscale phenomena; Tunneling, Chemical Bonds (types and strength); Intermolecular forces, molecular and crystalline structures; Hierarchical structures and functionality; Surfaces and interfaces, bulk to surface transition, self-assembly and surface reconstruction.

UNIT II – PROPERTIES OF NANO MATERIALS **(9)**

Size dependence of properties, phenomena and properties at nanoscale; Mechanical/frictional, optical, electrical transport; Magnetic properties.

UNIT III – SYNTHESIS OF NANOMATERIALS **(9)**

Fabrication techniques: Self-assembly, self-replication, sol-gels; Langmuir-Blodgett thin films, nanolithograph, bio-inspired syntheses, microfluidic processes; Chemical vapor deposition; Semiconductors, cadmium sulfide, silicon, fullerenes carbon nanotubes; Nano-composites, nanoporous materials, biological materials.

UNIT IV –NANOMATERIAL CHARACTERIZATION **(9)**

Electron microscopy, scanning probe microscopies, near field microscopy, micro- and near field Raman spectroscopy, surface-enhanced Raman, spectroscopy, X-ray photoelectron spectroscopy.

UNIT V –APPLICATIONS OF NANOMATERIALS **(9)**

Nanoelectronics, Nanosensors, environmental, biological, energy storage and fuel cells.

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1 Edelstein A. A. and Cammarata R .C., "Nanomaterials- Synthesis, Properties and Applications", Institute of Physics Publishing, 1998.
2 Nalwa H.S., "Handbook of Nanostructured Materials and Nanotechnology", Vols. 1- 5, Academic Press 2000.

REFERENCES:

1. Benedek et al G., "Nanostructured Carbon for Advanced Applications", Kluwer Academic Publishers 2001.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											
2	x											
3					x							
4	x				x							
5	x											

15PYZ02- NUCLEAR PHYSICS AND REACTORS
(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To provide knowledge of building block of nature –Nuclei –and its interaction with light
- To provide knowledge about the various reactors and power generation
- To empower knowledge in core science of reactor designing.
- To provide the understanding of different types of reactors
- To provide understanding of effective methods to utilize the nuclear energy

COURSE OUTCOMES:

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

CO1 : Acquire knowledge regarding fundamentals of nuclear reactions
CO2 : Understand the interaction of light with matter
CO3 : Acquire the knowledge about power generation form nuclear reactions
CO4 : Understand the mechanisms involved in reactor designing
CO5 : Enhance knowledge of thermal energy generation and reactor safety

UNIT I - STRUCTURE OF NUCLEI AND REACTIONS **(9)**

Fundamental particles, structure of nuclei; Binding Energy – nuclear stability – radioactive decay-nuclear reactions

UNIT II – INTERACTION OF RADIATION WITH MATTER **(9)**

Neutron interactions- energy loss in scattering collisions. Nuclear fission reaction- gamma ray interaction with matter-charged particles.

UNIT III – NUCLEAR REACTOR AND NUCLEAR POWER **(9)**

Fission chain reaction – reactor fuels. Nuclear power resources- power plants –nuclear reactors

UNIT IV–NUCLEAR REACTOR THEROY **(9)**

One group reactor equation –slab reactor –thermal reactor –reflected reactor

UNIT V –HEAT REMOVAL FROM NUCLEAR REACTORS **(9)**

Heat generations in reactors – heat flow in reactors, heat transfer mechanism. Radiation shielding: Gamma ray shielding, nuclear reactor shielding.

TOTAL (L:45) : 45 PERIODS

TEXT BOOK:

1. Leroy Murray Raymond, :Nuclear Reactor Physics", Prentice Hall

REFERENCE:

1. R. Lamarsh John, J. Baratta Anthony, "Introduction to Nuclear Engineering".

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	**POs**											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											
2			x		x							
3			x				x					
4	x				x							
5	x											

Approved by Seventh Academic Council

15PYZ03- SPACE SCIENCE AND TECHNOLOGY
(Common to All Branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To provide basics of space technology
- To give a knowledge of Space transportation systems
- To provide the understanding of transportation and satellite communication
- To understand the various space programs undertaken by international organizations
- To provide knowledge of application of space technology and manned missions

COURSE OUTCOMES:

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

CO1 : Acquire knowledge about classical theory of satellite orbits.
CO2 : Understand the rocket transportation to space.
CO3 : Acquire the applications of satellite communication and navigation.
CO4 : Appreciate the applications of space technology changed human life.
CO5 : Understand the importance of manned mission.

UNIT I - EARTH AND ORBITING SATELLITES **(9)**

Basic principles -Keplerian orbits and Kepler equations. Orbital elements, from velocity and position information. Perturbation theory and applications, Data receiving and handling

UNIT II – ROCKETS AND ROCKET PROPULSION **(9)**

Rockets and rocket propulsion, liquid fuels, solid fuels, Electromagnetic propulsion, Ion propulsion, Important satellite launching stations –Facilities at !SRO, NASA and ESRO Russian and Chinese facilities.

UNIT III – SATELLITE COMMUNICATION AND GPS **(9)**

Earth to satellite communication, Laser communication, Satellite to satellite communication Global navigation satellite systems, Application of GPS systems.

UNIT IV – APPLICATIONS OF SPACE TECHNOLOGY **(9)**

Physics of the earth's space, Solar observations in infrared, visible and X-rays, Communication satellite and applications, Earth resource monitoring, Remote sensing and others, Hubble space telescope. Military, applications, Weather satellite and applications.

UNIT V – MANNED FLIGHTS **(9)**

Manned flights to moon, Manned orbiting space crafts, NASA Space shuttles, Immunology and infection in space, The ISS and application, Russian space crafts, Skylab.

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

2. Space Science and Technology by Hans Mark, John Wiley and Sons.
3. The Cambridge encyclopedia of Space, missions, applications and exploration by Verger et at, Cambridge University Press 2003

REFERENCE BOOKS :

1. Space environment and it's interaction with spacecraft by C. Uberoi and S.C. Chakravorty, IISc — ISRO Educational Program
2. Introduction to GPS the global positioning system by El-Rabbany, Ahmed, London: Artech house

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											
2	x		x		x							
3	x				x							
4	x				x							
5	x											

15CYZ01-CHEMISTRY FOR ENGINEERS
(Common to all branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- Basic information and applications of chemistry in daily life.
- Imparting knowledge on basic concepts and applications of thermodynamics
- To know about the chemistry of building materials.
- To understand the concepts of phase rule and alloys
- To understand the principles and applications of photochemistry and nuclear chemistry.

COURSE OUTCOMES:

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

CO6 : Identify the role and importance of chemistry in daily life.
CO7 : Understand the thermodynamic and predict the feasibility of chemical reactions.
CO8 : Use the modern engineering tools for building materials and their industrial applications
CO9 : Acquire the knowledge of industrial importance of phase rule and alloys.
CO10 : Outline the principles and applications of photochemistry and nuclear chemistry.

UNIT I : CHEMISTRY IN DAILY LIFE **(9)**

Introduction – role and importance of chemistry in day to day life - Food additives - Fruits - vegetables - milk and egg - constituents and benefits - chemistry of soft drinks – adulterants - simple tests for the identification of adulterants in food stuffs – Fats and Oils – difference – analysis of fats and oils – saponification number – iodine number – principle and applications of green chemistry – safer solvents and auxiliaries

UNIT II : THERMODYNAMICS **(9)**

Thermodynamic process (isothermic, isobaric, isochoric and adiabatic process) – Internal energy – First law of thermodynamics (Mathematical derivation and limitation) – Enthalpy – Second law of thermodynamics - Entropy – Entropy change of an ideal gas and problems - Free energy - work function – Gibbs Helmoltz equation (derivation - applications –Third law and zeroeth law (only statements) – Van't Hoff isotherm (derivation only)

UNIT III : CHEMISTRY OF BUILDING MATERIALS **(9)**

Lime – classification – manufacture - properties of lime – Cement – classification – Portland cement – chemical composition – manufacture – setting and hardening – analysis of cement – concretes – weathering of concrete - special cements - gypsum – plaster of Paris – Glass – manufacture - types - properties and uses .

UNIT IV : PHASE RULE AND ALLOYS **(9)**

Statement and explanation of terms involved – one component system – water system – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic systems (lead – silver system only).

Alloys: Introduction- Definition- Properties of alloys- significance of alloying, Functions and effect of alloying elements - ferrous alloys – nichrome and stainless steel – heat treatment of steel, non-ferrous alloys – brass and bronze.

UNIT V : PHOTOCHEMISTRY & NUCLEAR CHEMISTRY **(9)**

Photochemistry: Laws of photochemistry–Einstein law and Lambert- Beer Law. Quantum efficiency – determination - Photo processes – Fluorescence - Phosphorescence, Chemiluminescence and Photo-sensitization. Nuclear chemistry**:** Nuclear decay – Half life period – Nuclear fission and fusion – Nuclear reactors – light water nuclear power plant – Applications of radioactivity.

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co.,New Delhi , 2012.
2. Ravikrishnan A., "Engineering Chemistry", Sri Krishna Hi-tech Publishing Company Pvt. Ltd.,Chennai, 2015.

REFERENCES:

1. Dara S.S.Umare S.S, “Engineering Chemistry”, S. Chand& Company Ltd., New Delhi 2014.
2. Puri B.R., Sharma L.R. and Pathania M.S., Principles of physical chemistry, ShobanLal Nagin Chand & Co., New Delhi
3. K. Karunakaran et al., “Engineering Chemistry”, Sonaversity, Sona College of Technology,Salem, 2014.

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Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x					x						
2	x						x					
3	x		x									
4	x		x			x						
5	x					x						

15CYZ02- SOIL CHEMISTRY
(Common to all branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To build fundamental knowledge and skills of the students within the different areas of soil chemistry.
- To familiarize the students with the origin of soil, properties of soil and soil forming processes.
- To identify and describe physical, chemical and biological properties of soil that affect agricultural and non-agricultural land.
- To impart basic knowledge on pesticides and fertilizers
- To understand the basic concepts of biomass energy production from wastes.

COURSE OUTCOMES:

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

CO1 : Gain the fundamental knowledge about soil chemistry
CO2 : Understand the properties of soil.
CO3 : Understand the impact of soil fertility in agricultural processes.
CO4 : Gain the knowledge about pesticides and fertilizers.
CO5 : Apply the knowledge to develop energy recovering technology from bio wastes.

UNIT I : SOIL INTRODUCTION **(9)**

Soil – definition – Composition of soil - classification of soils – Soil forming rocks and minerals – Soil forming factors and processes –Chemical weathering–hydration–oxidation–reduction–hydrolysis–solution method.

UNIT II : SOIL PROPERTIES **(9)**

Important physical properties of soil – Soil texture – bulk density – particle density and soil porosity– their importance – Ion exchange in soil – anion exchange capacity – cation exchange capacity – Soil colloids – definition – types – soil inorganic colloids –layer silicate clays – amorphous minerals

UNIT III : SOIL FERTILITY AND BIO FERTILIZERS **(9)**

Soil organic matter – its composition and decomposition – effect of soil organic matter on soil fertility – Humus – formation of humus – maintenance of humus – Bio fertilizers – Introduction – types – importance – Nitrogen fixer – rhizobium – algal bio fertilizers – cyanobacteria.

UNIT IV : PESTICIDES AND FERTILIZER CHEMISTRY **(9)**

Pesticides – classification – Chloro pesticides (Methoxychlor) – organophosphorus pesticides (Parathion) – carbamate pesticides (corbaryl) – Fertilizers – nitrogen fertilizers (urea, ammonium nitrate) – phosphorus fertilizers (single super phosphate, triple super phosphate) – potassium fertilizers (potassium sulphate) – NPK fertilizers (diammonium phosphate)

UNIT V : AGRICULTURAL WASTE AS A BIOMASS **(9)**

Bioenergy from wastes – Introduction – agricultural wastes – sources – utilization as a fuel – Bio chemical conversion of organic wastes – anaerobic digestion – methane production – thermal liquefaction –liquid fuel production – sludge treatment – activated sludge process

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. Brady, N.C and Weil, R.R 2012. The Nature and properties of Soils (13th Ed.). Pearson Education.
2. Clair N Sawyer, Perry I. Mc Carty, Gene F Parkin, Chemistry for Environmental engineering and science, Tata Mc graw – Hill Edition, 2014.

REFERENCES:

1. A text book of Bio technology by S.C.Bhatia, Atlantic publishers – 2015.
2. Samuel L. Disdale, Werner L. Nelson, James D. Beaton, Soil fertility and fertilizers, 8th Edition, Pearson Publishers, 2013.
3. Biofuels from agricultural wastes and Byproducts by Hans Blascheck, Thaddeus Ezeji, Jurgen Scheffran John Wiley & Sons, 2010.

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3	x		x									
4	x		x			x						
5	x					x						

15CYZ03 - ORGANIC CHEMISTRY
(Common to all branches)

L	T	P	C
3	0	0	3

OBJECTIVES

- To understand the basic concepts of organic chemistry.
- To study the type of components in which organic reaction take place.
- To know the preparation ofthe essential organic compounds.
- To impart knowledge on synthetic routes to many types of industrially important organic compounds and their characterization.
- To gain knowledge on carbohydrates, amino acids and proteins

COURSE OUTCOMES

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

CO1 : Apply knowledge of fundamental concepts of organic chemistry.
CO2 : Gain basic principles involved in different chemical synthesis and apply them in chemical industries.
CO3 : Outline the importance of pharmaceutical chemistry.
CO4 : Discuss carbohydrates, amino acids and proteins.
CO5 : Knowledge on various reaction mechanisms, preparation of organic compounds and their properties.

UNIT I : REACTIONS AND REAGENTS **(9)**

Organometallic compounds – Grignard reagent- synthesis of different types of compounds like - alchohol - aldehyde – acid- amine - Acetoacetic ester – tautomerism – base hydrolysis – acid hydrolysis- malonic ester - cyano acetic ester – synthesis of dicarboxylic acids – oxalic acid – succinic acid.

UNIT II : CARBOHYDRATES **(9)**

Monosaccharide - definition – classification - glucose – synthesis and chemical properties of glucose - Disaccharides - definition – classification - sucrose - synthesis and chemical properties of sucrose - Polysaccharides - definition – classification - cellulose - synthesis and chemical properties of cellulose - derivatives of cellulose.

UNIT III : AMINO ACIDS AND PROTEINS **(9)**

Proteins – definition – classification of amino acid - synthesis of alpha amino acid– chemical properties of alpha amino acid – Proteins – classification of proteins - chemical properties of proteins - structure of proteins - denaturation of proteins – colour test of proteins.

UNIT IV : HETEROCYCLIC COMPOUNDS **(9)**

Preparation, physical and chemical properties and uses of pyrrole –furan – thiophene- indole- pyridine – quinoline.

UNIT V : PHARMACEUTICAL CHEMISTRY **(9)**

Synthesis of malonylurea – phenacetin – isoniazid - p-amino benzoic acid (PABA)- chloroquine – sulphaniliamide.

TOTAL (L:45) : 45 PERIODS

TEXT BOOKS:

1. Morrison.R.T, & Boyd R, “Organic Chemistry” Edn., Prentice Hall India Pvt. Ltd. New Delhi, 2014
2. I.L. Finar “Organic Chemistry” Volume. 1, Sixth Edition, 2012.

REFERENCES:

1. Tewari. K.S, Vishnoi.N.k, Malhotra S.N., A Text Book of Organic Chemistry, Vikas publishing House Pvt. Ltd., New Delhi, 1986
2. Lakshmi. S, Pharmaceutical Chemistry First Edition (1995), Sultan Chand and Sons,New Delhi
3. P.L.Soni, A Text Book of organic Chemistry, Sultan Chand and Sons publishing Pvt. Ltd., 18th edition(1985).

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5	x					x						