B.Tech. (Full Time) - Information Technology
Curriculum & Syllabus
2013 – 2014

FACULTY OF ENGINEERING AND TECHNOLOGY
SRM UNIVERSITY
SRM NAGAR, KATTANKULATHUR – 603 203

B.Tech. Information Technology
Curriculum – 2013
(Applicable for students admitted from the academic year 2013-14 onwards)

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER I			**L**	**T**	**P**	**C**
PD1001	G	SOFT SKILLS I	1	0	1	1
MA1001	B	CALCULUS AND SOLID GEOMETRY	3	2	0	4
PY1001	B	PHYSICS	3	0	0	3
PY1002	B	PHYSICS LAB	0	0	2	1
CY1001	B	CHEMISTRY	3	0	0	3
CY1002	B	CHEMISTRY LAB	0	0	2	1
		Courses from Table I				
		Student shall register for minimum 20 credits in I semester and minimum 20 credits in II semester. However student shall have registered for all the courses enlisted under Semester I and II as well the courses in Table I by the time the registration process is complete in II semester. Keeping this in mind student shall register for the courses in I and II semesters.				

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER II			**L**	**T**	**P**	**C**
PD1002	G	SOFT SKILLS II	1	0	1	1
MA1002	B	ADVANCED CALCULUS AND COMPLEX ANALYSIS	3	2	0	4
PY1003	B	MATERIALS SCIENCE	2	0	2	3
CY1003	B	PRINCIPLES OF ENVIRONMENTAL SCIENCE	2	0	0	2
IT1002	P	IT FUNDAMENTALS	2	0	0	2
IT1003	P	PROGRAM DESIGN & DEVELOPMENT USING C	2	0	2	3
		Courses from Table I				
		Student shall register for minimum 20 credits in I semester and minimum 20 credits in II semester. However student shall have registered for all the courses enlisted under Semester I and II as well the courses in Table I by the time the registration process is complete in II semester. Keeping this in mind student shall register for the courses in I and II semesters.				

TABLE I
COURSES WHICH CAN BE REGISTERED FOR EITHER IN I OR II SEMESTER

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER I / II			L	T	P	C
LE1001	*G*	*ENGLISH*	*1*	*0*	*2*	*2*
LE1002	*G*	*VALUE EDUCATION*	*1*	*0*	*0*	*1*
CS1001	*G*	*PROGRAMMING USING MATLAB*	*1*	*0*	*2*	*2*
*BT1001**	*B*	*BIOLOGY FOR ENGINEERS*	*2*	*0*	*0*	*2*
CE1001	*E*	*BASIC CIVIL ENGINEERING*	*2*	*0*	*0*	*2*
ME1001	*E*	*BASIC MECHANICAL ENGINEERING*	*2*	*0*	*0*	*2*
EE1001	*E*	*BASIC ELECTRICAL ENGINEERING*	*2*	*0*	*0*	*2*
EC1001	*E*	*BASIC ELECTRONICS ENGINEERING*	*2*	*0*	*0*	*2*
ME1005	*E*	*ENGINEERING GRAPHICS*	*1*	*0*	*4*	*3*
*ME1006***	*E*	*WORKSHOP*	*0*	*0*	*3*	*2*
*EC1002***	*E*	*WORKSHOP – ELECTRONICS*	*0*	*0*	*2*	*1*
*EE1002***	*E*	*WORKSHOP – ELECTRICAL ENGINEERING PRACTICES*	*0*	*0*	*2*	*1*
*IT1001***	*E*	*COMPUTER HARDWARE AND TROUBLESHOOTING LAB*	*0*	*0*	*4*	*2*
NC1001/NS1001/ SP1001/ YG1001	*G*	**NCC/NSS/NSO/YOGA*	*0*	*0*	*1*	*1*

*NCC-National Cadet Corps
NSS-National Service Scheme
NSO-National Sports Organization (India)

*Not applicable for B.Tech. Genetic Engineering , Biotechnology and Bioinformatics programs.

**Against workshop course, students of B.Tech. ECE, ICE,EEE ,E& I and TCE shall register for EC1002 and EE 1002 only. Students of B.Tech, CSE and IT shall register for IT 1001 only. Students of all other programs shall register for ME1006 only.

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER III			**L**	**T**	**P**	**C**
LE1003/ LE1004/ LE1005/ LE1006/ LE1007	G	GERMAN LANGUAGE PHASE I / FRENCH LANGUAGE PHASE I/ JAPANESE LANGUAGE PHASE I / KOREAN LANGUAGE PHASE I / CHINESE LANGUAGE PHASE I	2	0	0	2
PD1003	G	APTITUDE I	1	0	1	1
MA1023	B	DISCRETE MATHEMATICS	4	0	0	4
IT1004	**P**	DESIGN AND ANALYSIS OF ALGORITHMS	3	0	0	3
IT1005	**P**	COMPUTER ORGANIZATION AND ARCHITECTURE	3	0	2	4
IT1006	**P**	OBJECT ORIENTED ANALYSIS AND DESIGN	2	0	2	3
		Courses from Table II				
		Students shall registeratleast one course with 2 credits and another course with 4 credits in each of III semester and IV semester from the courses listed in Table II.				
		TOTAL	**20**	**0**	**7**	**23**
		Total contact hours	**27**			

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER IV			**L**	**T**	**P**	**C**
LE1008/ LE1009/ LE1010/ LE1011/ LE1012	G	GERMAN LANGUAGE PHASE II / FRENCH LANGUAGE PHASE II/ JAPANESE LANGUAGE PHASE II / KOREAN LANGUAGE PHASE II / CHINESE LANGUAGE PHASE II	2	0	0	2
PD1004	G	APTITUDE II	1	0	1	1
MA1014	B	PROBABILITY AND QUEUING THEORY	4	0	0	4
IT1007	**E**	PRINCIPLES OF COMMUNICATION SYSTEMS	3	0	0	3
IT1008	**P**	MICROPROCESSORS AND MICROCONTROLLERS	3	0	2	4
IT1009	**P**	DATA STRUCTURES AND ALGORITHMS	2	0	2	3
		Courses from Table II				
		Students shall register atleast one course with 2 credits and another course with 4 credits in each of III semester and IV semester from the courses listed in Table II.				
		TOTAL	**20**	**0**	**7**	**23**
		Total contact hours	27			

TABLE II
COURSES WHICH CAN BE REGISTERED FOR EITHER IN III OR IV SEMESTER

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER III/ VI			**L**	**T**	**P**	**C**
IT1010	**G**	**Professional Ethics**	**2**	**0**	**0**	**2**
IT1011	**P**	**Human Computer Interaction**	**2**	**0**	**0**	**2**
IT1012	**P**	**Object Oriented programming in C++**	**3**	**0**	**2**	**4**
IT1013	**P**	**Programming in Java**	**3**	**0**	**2**	**4**

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER V			**L**	**T**	**P**	**C**
PD1005	G	APTITUDE III	1	0	1	1
IT1014	**P**	SYSTEM INTEGRATION AND ARCHITECTURE	3	0	0	3
IT1015	**P**	DATABASE MANAGEMENT SYSTEMS	3	0	2	4
IT1016	**P**	COMPUTER NETWORKS	3	0	2	4
IT1017	**P**	OPERATING SYSTEMS AND LINUX ADMINISTRATION	3	0	2	4
IT1047	P	INDUSTRIAL TRAINING I (Training to be undergone after IV semester)	0	0	1	1
	P	**Dep. Elective –I**	**3**	**0**	**0**	**3**
	P	**Dep. Elective -II**	3	0	0	3
	P	***Open Elective I***	*3*	*0*	*0*	*3*
		TOTAL	**22**	**0**	**8**	**26**
		Total Contact hours	**30**			

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER VI			**L**	**T**	**P**	**C**
PD1006	G	APTITUDE IV	1	0	1	1
MA1026	B	STATISTICS FOR INFORMATION TECHNOLOGY	4	0	0	4
IT1018	**P**	TCP/IP TECHNOLOGY	3	0	2	4
IT1019	**P**	INFORMATION STORAGE AND MANAGEMENT	3	0	0	3
IT1020	**P**	WEB SYSTEMS AND TECHNOLOGIES	3	0	2	4
IT1049	P	MINOR PROJECT	0	0	2	1
	P	**Dep. Elective III**	**3**	**0**	**0**	**3**
	P	***Open Elective II***	***3***	***0***	***0***	***3***
	P	***Dep. Elective IV***	**3**	**0**	**0**	**3**
		TOTAL	**23**	**0**	**7**	**26**
		Total contact hours	**30**			

COURSE CODE	CATEGORY	COURSE NAME				
SEMESTER VII			**L**	**T**	**P**	**C**
IT1021	**P**	INFORMATION ASSURANCE AND SECURITY	3	0	0	3
IT1022	**P**	INTEGRATIVE PROGRAMMING AND TECHNOLOGY	3	0	2	4
IT1023	**P**	MANAGEMENT INFORMATION SYSTEMS	3	0	0	3
IT1024	**P**	PRINCIPLES OF CLOUD COMPUTING	3	0	2	4
IT1048	**P**	INDUSTRIAL TRAINING II (Training to be undergone after VI semester)	0	0	1	1
	P	***Open Elective III***	***3***	***0***	***0***	***3***
	P	***Dep. Elective V***	**3**	**0**	**0**	**3**
		TOTAL	**18**	**0**	**5**	**21**
		Total contact hours	**23**			
COURSE CODE	**CATEGORY**	**COURSE NAME**				

SEMESTER VIII			**L**	**T**	**P**	**C**
IT1050	P	MAJOR PROJECT / PRACTICE SCHOOL	0	0	24	12
		Total	0	0	24	12
		Total contact hours	24			

OPEN ELECTIVES

COURSE CODE	***CATEGORY***	***COURSE NAME***	***L***	***T***	***P***	***C***
IT1201	***P***	***INFORMATION SECURITY***	***3***	***0***	***0***	***3***
IT1202	***P***	***INTRODUCTION TO DATABASE MANAGEMENT SYSTEM***	***3***	***0***	***0***	***3***
IT1203	***P***	***WEB DESIGN***	***3***	***0***	***0***	***3***

		DEPARTMENT ELECTIVES				
COURSE CODE	**CATEGORY**	**COURSE NAME**	**L**	**T**	**P**	**C**
DATABASE						
IT1101	P	DATA WAREHOUSING AND DATA MINING	3	0	0	3
IT1102	P	KNOWLEDGE MANAGEMENT	3	0	0	3
IT1103	P	TEXT MINING	3	0	0	3
IT1104	P	DATABASE ADMINISTRATION	2	0	2	3
IT1105	P	BACKUP RECOVERY SYSTEMS AND ARCHITECTURE	3	0	0	3
IT1106	P	E-COMMERCE	3	0	0	3
IT1107	P	BUSINESS INTELLIGENCE	3	0	0	3
IT1108	P	BUSINESS ANALYTICS	3	0	0	3
IT1109	P	ENTERPRISE RESOURCE PLANNING	3	0	0	3
IT1110	P	DATA SCIENCE AND BIG DATA ANALYTICS	2	0	2	3
MULTIMEDIA						
IT1111	P	MULTIMEDIA TOOLS AND APPLICATIONS	2	0	2	3
IT1112	P	COMPUTER GRAPHICS	2	0	2	3
IT1113	P	DIGITAL AUDIO AND COMPUTER MUSIC	3	0	0	3
IT1114	P	GAME PROGRAMMING	2	0	2	3
IT1115	P	MULTIMEDIA NETWORKS	3	0	0	3
IT1116	P	COMPUTER ANIMATION: ALGORITHMS & TECHNIQUES	2	0	2	3
NETWORKS & SECURITY						
IT1117	P	CRYPTOGRAPHY	3	0	0	3
IT1118	P	SECURE CODING PRINCIPLES	2	0	2	3
IT1119	P	NETWORK SECURITY	2	0	2	3

IT1120	P	FORENSICS AND INCIDENT RESPONSE	2	0	2	3
IT1121	P	BIOMETRICS	3	0	0	3
IT1122	P	WIRELESS AND MOBILE COMMUNICATION	3	0	0	3
IT1123	P	NETWORK DESIGN AND MANAGEMENT	3	0	0	3
IT1124	P	MULTILAYER SWITCHING	3	0	0	3
IT1125	P	NETWORK SIMULATION & MODELLING	3	0	0	3
PROGRAMMING & WEB SYSTEMS						
IT1126	P	INTERACTIVE WEB PAGE SCRIPTING	3	0	0	3
IT1127	P	PROGRAMMING MULTIMEDIA FOR THE WEB	3	0	0	3
IT1128	P	ADVANCED WEB APPLICATION DEVELOPMENT	2	0	2	3
IT1129	P	ADVANCED JAVA PROGRAMMING	2	0	2	3
IT1130	P	MOBILE APPLICATION DEVELOPMENT	2	0	2	3
IT1131	P	VISUAL PROGRAMMING	2	0	2	3
IT1132	P	CLOUD APPLICATION DEVELOPMENT	2	0	2	3
IT1140	P	PYTHON PROGRAMMING	2	0	2	3
SOFTWARE/HARDWARE SYSTEMS						
IT1133	P	DATA COMPRESSION	3	0	0	3
IT1134	P	PARALLEL PROGRAMMING USING OPENCL	3	0	0	3
IT1135	P	SOFTWARE TESTING	3	0	0	3
IT1136	P	PARALLEL ARCHITECTURE & ALGORITHMS	3	0	0	3
IT1137	P	GENETIC ALGORITHMS	3	0	0	3
IT1138	P	INTERNET OF THINGS	3	0	0	3
IT1139	P	PERVASIVE COMPUTING	3	0	0	3
IT1141	P	MACHINE LEARNING	3	0	0	3
IT1142	P	FUNDAMENTALS OF VIRTUALIZATION	3	0	0	3

CS1139	P	NATURAL LANGUAGE PROCESSING	3	0	0	3

Summary of credits										
Category	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**Total**	**%**
G (Excluding open and departmental electives)	4	4	3/5	5/3	1	1			18	10.00
B (Excluding open and departmental electives)	12	11	4	4		4			35	19.45
E (Excluding open and departmental electives)	7	6		3					16	8.89
P (Excluding open and departmental electives)		5	16/14	11/13	16	12	15	12	87	48.33
Open Elective					3	6			9	5.00
Dep. Elective					6	3	6		15	8.33
Total	23	26	23	23	26	26	21	12	180	100

STUDENT OUTCOMES AS PROVIDED BY COMPUTING ACCREDITATION COMMISSION (CAC), ABET, USA

(a) An ability to apply knowledge of computing and mathematics appropriate to the discipline
(b) An ability to analyze a problem, and identify and define the computing requirements
(c) appropriate to its solution
(d) An ability to design, implement, and evaluate a computer-based system, process, component,
(e) or program to meet desired needs

(f) An ability to function effectively on teams to accomplish a common goal
(g) An understanding of professional, ethical, legal, security and social issues and responsibilities
(h) An ability to communicate effectively with a range of audiences
(i) An ability to analyze the local and global impact of computing on individuals, organizations,
(j) and society
(k) Recognition of the need for and an ability to engage in continuing professional development
(l) An ability to use current techniques, skills, and tools necessary for computing practice.
(m) An ability to use and apply current technical concepts and practices in the core information
(n) technologies. [IT]
(o) An ability to identify and analyze user needs and take them into account in the selection,
(p) creation, evaluation and administration of computer-based systems. [IT]
(q) An ability to effectively integrate IT-based solutions into the user environment. [IT]
(r) An understanding of best practices and standards and their application. [IT]
(s) An ability to assist in the creation of an effective project plan. [IT]

STUDENT OUTCOMES AS PROVIDED BY ENGINEERING ACCREDITATION COMMISSION (EAC), ABET, USA*

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within
(d) realistic constraints such as economic, environmental, social, political, ethical, health and
(e) safety, manufacturability, and sustainability
(f) an ability to function on multidisciplinary teams
(g) an ability to identify, formulate, and solve engineering problems
(h) an understanding of professional and ethical responsibility
(i) an ability to communicate effectively
(j) the broad education necessary to understand the impact of engineering solutions in a
(k) global, economic, environmental, and societal context
(l) a recognition of the need for, and an ability to engage in life-long learning

(m) a knowledge of contemporary issues
(n) an ability to use the techniques, skills, and modern engineering tools necessary for
(o) engineering practice.

- Applicable to other than Professional Category Courses

ENGINEERING SCIENCES AND TECHNICAL ART category
SEMESTER I

		L	T	P	C
PD1001	**SOFT SKILLS I**	**1**	**0**	**1**	**1**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				

PURPOSE	
To enhance holistic development of students and improve their employability skills.	
INSTRUCTIONAL OBJECTIVES	
1.	To develop inter personal skills and be an effective goal oriented team player.
2.	To develop professionals with idealistic, practical and moral values.
3.	To develop communication and problem solving skills.
4.	To re-engineer attitude and understand its influence on behavior.

UNIT I-SELF ANALYSIS **(4 hours)**
SWOT Analysis, Who am I, Attributes, Importance of Self Confidence, Self Esteem

UNIT II –ATTITUDE **(4 hours)**
Factors influencing Attitude, Challenges and lessons from Attitude.

Change Management
Exploring Challenges, Risking Comfort Zone, Managing Change

UNIT III-MOTIVATION **(6 hours)**
Factors of motivation, Self talk, Intrinsic & Extrinsic Motivators.

UNIT IV-GOAL SETTING **(6 hours)**
Wish List, SMART Goals, Blue print for success, Short Term, Long Term, Life Time Goals.

Time Management
Value of time, Diagnosing Time Management, Weekly Planner To do list, Prioritizing work.

UNIT V-CREATIVITY **(10 hours)**
Out of box thinking, Lateral Thinking
Presentation

ASSESSMENT

1. A practical and activity oriented course which has continuous assessment for 75 marks based on class room interaction, activities etc.
2. Presentation – 25 marks

REFERENCES

1. INSIGHT, 2009, Career Development Centre, SRM Publications .
2. Covey Sean, "*Seven Habits of Highly Effective Teens"*, New York, Fireside Publishers, 1998.
3. Carnegie Dale, "*How to win Friends and Influence People"*, New York: Simon & Schuster, 1998.
4. Thomas A Harris, "*I am ok, You are ok* ", New York-Harper and Row, 1972
5. Daniel Coleman, "*Emotional Intelligence"*, Bantam Book, 2006

PD1001 SOFT SKILLS I												
Course designed by		**Career Development Centre**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
					X		X	X		X		
2	Mapping of instructional objectives with student outcome				1		2	3		4		
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)			
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	**T**	**P**	**C**

MA1001	CALCULUS AND SOLID GEOMETRY	3	2	0	4
	Total contact hours - 60 hours				
	(Common to all Branches of Engineering except Bio group)				

PURPOSE	
To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.	
INSTRUCTIONAL OBJECTIVES	
1.	To apply advanced matrix knowledge to Engineering problems.
2.	To equip themselves familiar with the functions of several variables.
3.	To familiarize with the applications of differential equations.
4.	To improve their ability in solving geometrical applications of differential calculus problems
5.	To expose to the concept of three dimensional analytical geometry.

UNIT I-MATRICES (12 hours)

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Cayley – Hamilton theorem orthogonal reduction of a symmetric matrix to diagonal form – Orthogonal matrices – Reduction of quadratic form to canonical form by orthogonal transformations.

UNIT II-FUNCTIONS OF SEVERAL VARIABLES (12hours)

Function of two variables – Partial derivatives – Total differential – Taylor's expansion – Maxima and Minima – Constrained Maxima and Minima by Lagrangian Multiplier method – Jacobians – Euler's theorem for homogeneous function.

UNIT III-ORDINARY DIFFERENTIAL EQUATIONS (12 hours)

Linear equations of second order with constant and variable coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form – Variation of parameter – Simultaneous first order with constant co-efficient.

UNIT IV-GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS (12 hours)

Curvature – Cartesian and polar coordinates – Circle of curvature – Involutes and Evolutes – Envelopes – Properties of envelopes.

UNIT V-THREE DIMENSIONAL ANALYTICAL GEOMETRY **(12 hours)**

Equation of a sphere – Plane section of a sphere – Tangent Plane – Orthogonal Sphere - Equation of a cone – Right circular cone – Equation of a cylinder – Right circular cylinder.

REFERENCES

1. K.Ganesan, Sundarammal Kesavan, K.S.Ganapathy Subramanian & V.Srinivasan, Engineering Mathematics, Revised Edition, 2013.
2. Grewal B.S, Higher Engineering Mathematics, Khanna Publications, 42nd Edition,2012.
3. Veerajan. T, Engineering Mathematics I, Tata McGraw Hill Publishing Co, New Delhi, 5th edition, 2006.
4. Kreyszig.E, Advanced Engineering Mathematics, John Wiley & Sons. Singapore, 10th edition, 2012.
5. Kandasamy P etal. Engineering Mathematics, Vol.I (4th revised edition), S.Chand &Co., New Delhi, 2000.
6. Narayanan S., Manicavachagom Pillay T.K., Ramanaiah G., Advanced Mathematics for Engineering students, Volume I (2nd edition), S.Viswanathan Printers and Publishers, 1992.
7. Venkataraman M.K., Engineering Mathematics – First Year (2nd edition), National Publishing Co., Chennai, 2000.
8. David E.Penney and C.Henry Edwards, Single Variable Calculus, Prentice Hall; 6th edition, 2002.

MA1001 CALCULUS AND SOLID GEOMETRY												
Course designed by		**Department of Mathematics**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X				X						
2	Mapping of instructional objectives with student outcome	1-5				1-5						
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical		Professional Subjects (P)				

				Arts (E)	
			X		
4	Broad Area	Structural Engineering	Geotechnical Engineering	Water Resources Engineering	Geomatics Engineering
5	Approval	23rd meeting of academic council, May 2013			

		L	T	P	C
PY1001	**PHYSICS**	**3**	**0**	**0**	**3**
	Total Contact Hours - 45				
	Prerequisite				
	Nil				

PURPOSE

The purpose of this course is to provide an understanding of physical concepts and underlying various engineering and technological applications. In addition, the course is expected to develop scientific temperament and analytical skill in students, to enable them to logically tackle complex engineering problems in their chosen area of application.

INSTRUCTIONAL OBJECTIVES

1.	To appreciate and understand scientific concepts underlying engineering and technological applications
2.	To apply the Physics concepts in solving engineering problems
3.	To educate scientific developments in engineering and technology
4.	To emphasize the significance of Green technology through Physics principles
5.	To provide a modest experience to handle and experiment with various measuring instruments

UNIT I–MECHANICAL PROPERTIES OF SOLIDS AND ACOUSTICS (10 hours)

Mechanical properties of solids: Stress-strain relationship – Hooke's law – Torsional Pendulum – Young's modulus by cantilever – Uniform and non-uniform bending — Stress-strain diagram for various engineering materials –

Ductile and brittle materials – Mechanical properties of Engineering materials (Tensile strength, Hardness, Fatigue, Impact strength, Creep) – Fracture – Types of fracture (Elementary ideas).

Acoustics: Intensity – Loudness – Absorption coefficient and its determination – Reverberation – Reverberation time – Factors affecting acoustics of buildings and their remedies – Sources and impacts of noise – Sound level meter – Strategies on controlling noise pollution – Methods of Ultrasonic production (Magnetostriction and Piezoelectric) – Applications of Ultrasonics in Engineering and medicine.

UNIT II – ELECTROMAGNETIC WAVES, CIRCUITS AND APPLICATIONS (8 hours)

Del operator – grad, div, curl and their physical significances - displacement current –Maxwell's equations – Wave equation for electromagnetic waves – Propagation in free space – Poynting theorem – Characteristic of Transverse electric and magnetic waves – Rectangular and circular waveguides – High powered vacuum-based cavity magnetrons – Applications including radars, microwave oven and lighting systems.

UNIT III–LASERS AND FIBER OPTICS (8 hours)

Lasers: Characteristics of Lasers – Einstein's coefficients and their relations – Lasing action – Working principle and components of CO_2 Laser, Nd-YAG Laser, Semiconductor diode Laser, Excimer Laser and Free electron Laser – Applications in Remote sensing, holography and optical switching – Mechanism of Laser cooling and trapping.

Fiber Optics: Principle of Optical fiber – Acceptance angle and acceptance cone – Numerical aperture – V-number – Types of optical fibers (Material, Refractive index and mode) – Fiber optic communication – Fiber optic sensors.

UNIT IV–QUANTUM MECHANICS AND CRYSTAL PHYSICS (10 hours)

Quantum mechanics: Inadequacies of Classical Mechanics – Duality nature of electromagnetic radiation – De Broglie hypothesis for matter waves – Heisenberg's uncertainty principles –Schrödinger's wave equation – Particle confinement in 1D box (Infinite Square well potential).

Crystal Physics: Crystal directions – Planes and Miller indices – Symmetry elements – Quasi crystals – Diamond and HCP crystal structure –Reciprocal lattice – Diffraction of X-rays by crystal planes – Laue method and powder method – Imperfections in crystals.

UNIT V–GREEN ENERGY PHYSICS (9 hours)

Introduction to Green energy – **Solar energy:** Energy conversion by photovoltaic principle – Solar cells – **Wind energy:** Basic components and principle of wind energy conversion systems – **Ocean energy:** Wave energy – Wave energy conversion devices – Tidal energy – single and double basin tidal power plants – Ocean Thermal Electric Conversion (OTEC) – **Geothermal energy:** Geothermal sources (hydrothermal, geo-pressurized hot dry rocks, magma) – **Biomass:** Biomass and bio-fuels – bio-energies from wastages – **Fuel cells**: H_2O_2 – **Futuristic Energy:** Hydrogen – Methane Hydrates – Carbon capture and storage (CCS).

REFERENCES

1. WoleSoboyejo, "*Mechanical Properties of Engineered Materials*", Marcel Dekker Inc., 2003
2. Frank Fahy, "*Foundations of Engineering Acoustics*", Elsevier Academic Press, 2005
3. Alberto Sona, "*Lasers and their applications*", Gordon and Breach Science Publishers Ltd., 1976
4. David J. Griffiths, "*Introduction to electrodynamics*", 3rd ed., Prentice Hall, 1999
5. AjoyGhatak and S. Lokanathan, "*Quantum Mechanics"*, Fifth Edition, Macmillan, 2009.
6. David J. Griffiths, "*Introduction to Quantum Mechanics",* Second Edition, Pearson, 2009.
7. Charles Kittel, "*Introduction to Solid State Physics*", Wiley India Pvt. Ltd, 7th ed., 2007
8. Godfrey Boyle, "*Renewable Energy: Power sustainable future*", 2nd edition, Oxford University Press, UK, 2004

PY1001 PHYSICS												
Course designed by		**Department of Physics and Nanotechnology**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X		X		X						
2	Mapping of instructional objectives with student outcome	1		3		2						
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
				X								
4	Broad Area (for courses under 'P' only)	Structural Engineering		Geotechnical Engineering		Water Resources Engineering		Geomatics Engineering				
		--		--		--		--				
5	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
PY1002	**PHYSICS LABORATORY**	**0**	**0**	**2**	**1**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				

PURPOSE

The purpose of this course is to develop scientific temper in experimental techniques and to reinforce the physics concepts among the engineering students

INSTRUCTIONAL OBJECTIVES

1.	To gain knowledge in the scientific methods and learn the process of measuring different Physical variables
2.	Develop the skills in arranging and handling different measuring instruments
3.	Get familiarized with experimental errors in various physical

	measurements and to plan / suggest on how the contributions could be made of the same order, so as to minimize the errors.

LIST OF EXPERIMENTS

1. Determination of Young's modulus of a given material – Uniform / Non-uniform bending methods.
2. Determination of Rigidity modulus of a given material – Torsion pendulum
3. Determination of dispersive power of a prism – Spectrometer
4. Determination of laser parameters – divergence and wavelength for a given laser source –laser grating/ Particle size determination using laser
5. Study of attenuation and propagation characteristics of optical fiber cable
6. Calibration of voltmeter / ammeter using potentiometer
7. Construction and study of IC regulation properties of a given power supply
8. Study of V-I and V-R characteristics of a solar cell
9. Mini Project – Concept based Demonstration

REFERENCES

1. G.L.Souires, "*Practical Physics*, 4th Edition, Cambridge University, UK, 2001.
2. R.K.Shukla and Anchal Srivastava, "*Practical Physics*", 1st Edition, New Age International (P) Ltd, New Delhi, 2006.
3. D. Chattopadhyay, P. C. Rakshit and B. Saha, "*An Advanced Course in Practical Physics*", 2nd ed., Books & Allied Ltd., Calcutta, 1990

PY1002 PHYSICS LABORATORY	
Course designed by	Department of Physics and Nanotechnology

1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X	X			X						
2	Mapping of instructional objectives with student outcome	1	3			2						
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
				X								
4	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
CY1001	**CHEMISTRY**	3	0	0	3
	Total Contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

To enable the students to acquire knowledge in the principles of chemistry for engineering applications

INSTRUCTIONAL OBJECTIVES

1.	The quality of water and its treatment methods for domestic and industrial applications.
2.	The classification of polymers, different types of polymerizations, preparation, properties and applications of important polymers and FRPs.
3.	The phase rule and its application to one and two component systems.
4.	The principle, types and mechanism of corrosion and protective coatings.
5.	The classification and selection of lubricants and their applications.
6.	The basic principles, instrumentation and applications of analytical techniques

UNIT I-WATER TREATMENT **(9 hours)**

Water quality parameters: Physical, Chemical & Biological significance - Hardness of water - estimation of hardness (EDTA method) - Dissolved oxygen – determination (Winkler's method), Alkalinity - determination - disadvantages of using hard water in boilers: Scale, sludge formation - disadvantages - prevention - treatment: Internal conditioning - phosphate, calgon and carbonate conditioning methods - External: Zeolite, ion exchange methods - desalination - reverse osmosis and electrodialysis - domestic water treatment.

UNIT II-POLYMERS AND REINFORCED PLASTICS (9 hours)

Classification of polymers - types of polymerization reactions - mechanism of addition polymerization: free radical, ionic and Ziegler - Natta - effect of structure on the properties of polymers - strength, plastic deformation, elasticity and crystallinity -Preparation and properties of important resins: Polyethylene, PVC, PMMA, Polyester, Teflon, Bakelite and Epoxy resins - compounding of plastics - moulding methods - injection, extrusion, compression and calendaring - reinforced plastics - FRP – Carbon and Glass-applications.

UNIT III-PHASE EQUILIBRIA,LUBRICANTS AND ADHESIVES (9 hours)

Phase rule: Statement - explanation of the terms involved - one component system (water system only). Condensed phase rule - thermal analysis - two component systems: simple eutectic, Pb-Ag; compound formation, Zn-Mg. Lubricants: Classification –solid, semi solid, liquid, emulsion- properties – selection of lubricants for different purposes, Adhesives: classification-natural, synthetic, inorganic- Adhesive action - applications.

UNIT IV-CORROSION AND ITS CONTROL (9 hours)

Corrosion: Basic concepts - mechanism of chemical, electrochemical corrosion - Pilling Bedworth rule – Types of Electrochemical corrosion - galvanic corrosion - differential aeration corrosion - pitting corrosion - stress corrosion – Measurement of corrosion (wt. loss method only) - factors influencing corrosion.

Corrosion control: Cathodic protection - sacrificial anodic method - corrosion inhibitors. Protective coatings: surface preparation for metallic coatings - electro plating (copper plating) and electroless plating (Nickel plating) - chemical conversion coatings - anodizing, phosphating & chromate coating.

UNIT V-INSTRUMENTAL METHODS OF ANALYSIS (9 hours)

Basic principles, instrumentation and applications of potentiometry, UV - visible spectroscopy, infrared spectroscopy, atomic absorption spectroscopy and flame photometry .

REFERENCES

1. Jain.P.C and Monika Jain, "*Engineering Chemistry*", Danpat Rai publishing company (P) Ltd, New Delhi, 2010.
2. Kamaraj.P & Arthanareeswari. M, *Applied Chemistry, 9th Edition*, Sudhandhira Publications, 2012.
3. Jeyalakshmi.R & Ramar. P, *Engineering Chemistry*, 1st Edition, Devi Publications, Chennai, 2006
4. Helen P Kavitha, *Engineering Chemistry - I, Scitech* Publications, 2nd edition, 2008.

CY1001 CHEMISTRY												
Course designed by		**Department of Chemistry**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
			x	**x**		**x**						**x**
2	Mapping of instructional objective with student outcome		**1,6**	**3**		**2,5**						**4**
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)	
					x							
4	Approval	23rd meeting of Academic Council, May 2013										

		L	**T**	**P**	**C**

CY1002	CHEMISTRY LABORATORY	0	0	2	1
	Total Contact hours - 30				
	Prerequisite				
	Nil				

PURPOSE	
To apply the concepts of chemistry and develop analytical skills for applications in engineering.	
INSTRUCTIONAL OBJECTIVES	
1.	To enable the students to understand the basic concepts involved in the analyses.

LIST OF EXPERIMENTS

1. Preparation of standard solutions
2. Estimation of total, permanent and temporary hardness by EDTA method
3. Conductometric titration - determination of strength of an acid
4. Estimation of iron by potentiometry.
5. Determination of molecular weight of polymer by viscosity average method
6. Determination of dissolved oxygen in a water sample by Winkler's method
7. Determination of Na / K in water sample by Flame photometry (Demonstration)
8. Estimation of Copper in ore
9. Estimation of nickel in steel
10. Determination of total alkalinity and acidity of a water sample
11. Determination of rate of corrosion by weight loss method.

REFERENCES

1. Kamaraj & Arthanareeswari ,"*Practical Chemistry (work book")* – , Sudhandhira Publications, 2011.
2. Helen P. Kavitha ,Chemistry Laboratory Manual –, Scitech Publications, 2008.

CY1002 CHEMISTRY LABORATORY	
Course designed by	**Department of Chemistry**

1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
		x	**x**									**x**
2	Mapping of instructional objective with student outcome	**1**	**1**									**1**
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)	
					x							
4	Approval	23rd meeting of Academic Council, May 2013										

SEMESTER II

		L	T	P	C
PD1002	**SOFT SKILLS II**	**1**	**0**	**1**	**1**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				

PURPOSE

To enhance holistic development of students and improve their employability skills.

INSTRUCTIONAL OBJECTIVES

1.	To develop inter personal skills and be an effective goal oriented team player.
2.	To develop professionals with idealistic, practical and moral values.
3.	To develop communication and problem solving skills.
4.	To re-engineer attitude and understand its influence on behavior.

UNIT I -INTERPERSONAL SKILLS (6 hours)

Understanding the relationship between Leadership Networking & Team work, Realizing Ones Skills in Leadership, Networking & Team Work, and Assessing Interpersonal Skills Situation description of Interpersonal Skill.

Team Work

Necessity of Team Work Personally, Socially and Educationally

UNIT II -LEADERSHIP (4 hours)

Skills for a good Leader, Assessment of Leadership Skills

Change Management

Exploring Challenges, Risking Comfort Zone, Managing Change

UNIT III-STRESS MANAGEMENT (6 hours)

Causes of Stress and its impact, how to manage & distress, Understanding the circle of control, Stress Busters.

Emotional Intelligence

What is Emotional Intelligence, emotional quotient why Emotional Intelligence matters, Emotion Scales. Managing Emotions.

UNIT IV-CONFLICT RESOLUTION (4 hours)

Conflicts in Human Relations – Reasons Case Studies, Approaches to conflict resolution.

UNIT V-DECISION MAKING (10 hours)

Importance and necessity of Decision Making, process of Decision Making, Practical way of Decision Making, Weighing Positives & Negatives.

Presentation

ASSESSMENT

1. A practical and activity oriented course which has a continuous assessment for 75 marks based on class room interaction, activities etc.,
2. Presentation - 25 marks

REFERENCES

1. INSIGHT, 2009. Career Development Centre, SRM Publications
2. Covey Sean, *Seven Habit of Highly Effective Teens*, New York, Fireside Publishers, 1998.
3. Carnegie Dale, *How to win Friends and Influence People*, New York: Simon & Schuster, 1998.
4. Thomas A Harris, *I am ok, You are ok* , New York-Harper and Row, 1972
5. Daniel Coleman, *Emotional Intelligence*, Bantam Book, 2006

PD1002 SOFT SKILLS II												
Course designed by		Career Development Centre										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k

					X		X	X		X		
2	Mapping of instructional objectives with student outcome				1		2	3		4		
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)			
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

MA1002	ADVANCED CALCULUS AND COMPLEX ANALYSIS	L	T	P	C
		3	2	0	4
	Total contact hours - 60 hours				
	(Common to all Branches of Engineering except Biogroup)				

PURPOSE

To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.

INSTRUCTIONAL OBJECTIVES

1	To have knowledge in multiple calculus
2	To improve their ability in Vector calculus
3	To equip themselves familiar with Laplace transform
4	To expose to the concept of Analytical function
5	To familiarize with Complex integration

UNIT I-MULTIPLE INTEGRALS (12 hours)

Double integration in Cartesian and polar coordinates – Change of order of integration – Area as a double integral – Triple integration in Cartesian coordinates – Conversion from Cartesian to polar – Volume as a Triple Integral.

UNIT II-VECTOR CALCULUS (12 hours)

Gradient, divergence, curl – Solenoidal and irrotational fields – Vector identities (without proof) – Directional derivatives – Line, surface and volume integrals –Green's, Gauss divergence and Stoke's theorems (without

proof) – Verification and applications to cubes and parallelopipeds only.

UNIT III-LAPLACE TRANSFORMS (12 hours)

Transforms of simple functions – Basic operational properties – Transforms of derivatives and integrals – Initial and final value theorems – Inverse transforms – Convolution theorem – periodic functions – Applications of Laplace transforms for solving linear ordinary differential equations up to second order with constant coefficients only.

UNIT IV-ANALYTIC FUNCTIONS (12 hours)

Definition of Analytic Function – Cauchy Riemann equations – Properties of analytic functions - Determination of harmonic conjugate – Milne-Thomson's method – Conformal mappings: 1/z, az , az+b and bilinear transformation.

UNIT V-COMPLEX INTEGRATION (12 hours)

Line integral – Cauchy's integral theorem (without proof) – Cauchy's integral formulae and its applications – Taylor's and Laurent's expansions (statements only) – Singularities – Poles and Residues – Cauchy's residue theorem – Contour integration – Unit circle and semi circular contour.

REFERENCES

1. K.Ganesan, Sundarammal Kesavan, K.S.Ganapathy Subramanian & V.Srinivasan, "*Engineering Mathematics"*, Revised Edition, 2013.
2. Grewal B.S, "*Higher Engg Maths"*, Khanna Publications, 42nd Edition,2012.
3. Veerajan, T., "*Engineering Mathematics I"*, Tata McGraw Hill Publishing Co., New Delhi, 5th edition, 2006.
4. Kreyszig.E, "*Advanced Engineering Mathematics"*, 10th edition, John Wiley & Sons. Singapore,2012.
5. Kandasamy P etal,"*Engineering Mathematics"*, Vol.I (4th revised edition), S.Chand &Co., New Delhi,2000.
6. Narayanan S., Manicavachagom Pillay T.K., Ramanaiah G.," *Advanced Mathematics for Engineering students"*, Volume I (2nd edition), S.Viswanathan Printers and Publishers, 1992.
7. Venkataraman M.K.,"*Engineering Mathematics – First Year"* (2nd edition), National Publishing Co., Chennai,2000

MA1002 ADVANCED CALCULUS AND COMPLEX ANALYSIS												
Course designed by		**Department of Mathematics**										
1	Student	a	b	c	d	e	f	g	h	i	j	k

	Outcome	X				X						
2	Mapping of instructional objectives with student outcome	1-5				1-5						
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences & Technical Arts (E)			Professional Subjects (P)		
				X								
4	Broad Area	Structural Engineering		Geotechnical Engineering			Water Resources Engineering			Geomatics Engineering		
5	Approval	23rd meeting of academic council, May 2013										

		L	T	P	C
PY1003	**MATERIALS SCIENCE**	**2**	**0**	**2**	**3**
	Total Contact Hours - 60				
	Prerequisite				
	Nil				

PURPOSE

The course introduces several advanced concepts and topics in the rapidly evolving field of material science. Students are expected to develop comprehension of the subject and to gain scientific understanding regarding the choice and manipulation of materials for desired engineering applications.

INSTRUCTIONAL OBJECTIVES

1.	To acquire basic understanding of advanced materials, their functions and properties for technological applications
2.	To emphasize the significance of materials selection in the design process
3.	To understand the principal classes of bio-materials and their functionalities in modern medical science
4.	To get familiarize with the new concepts of Nano Science and Technology
5.	To educate the students in the basics of instrumentation, measurement, data acquisition, interpretation and analysis

UNIT I–ELECTRONIC AND PHOTONIC MATERIALS (6 hours)

Electronic Materials: Fermi energy and Fermi–Dirac distribution function – Variation of Fermi level with temperature in intrinsic and extrinsic semiconductors – Hall effect – Dilute Magnetic Semiconductors (DMS) and their applications

Superconducting Materials: Normal and High temperature superconductivity – Applications.

Photonic Materials: LED – LCD – Photo conducting materials – Photo detectors (CCD) – Photonic crystals and applications – Elementary ideas of Non-linear optical materials and their applications.

UNIT II–MAGNETIC AND DIELECTRIC MATERIALS (6 hours)

Magnetic Materials: Classification of magnetic materials based on spin – Hard and soft magnetic materials – Ferrites, garnets and magnetoplumbites – Magnetic bubbles and their applications – Magnetic thin films – Spintronics and devices (Giant magneto resistance, Tunnel magneto resistance and Colossal magneto resistance).

Dielectric Materials: Polarization mechanisms in dielectrics – Frequency and temperature dependence of polarization mechanism – Dielectric loss – Dielectric waveguide and dielectric resonator antenna – Piezoelectric, pyroelectric and ferroelectric materials and their applications.

UNIT III–MODERN ENGINEERING AND BIOMATERIALS (6 hours)

Modern Engineering Materials: Smart materials – Shape memory alloys – Chromic materials (Thermo, Photo and Electro) – Rheological fluids – Metallic glasses – Advanced ceramics – Composites.

Bio-materials: Classification of bio-materials (based on tissue response) – Comparison of properties of some common biomaterials – Metallic implant materials (stainless steel, cobalt-based and titanium-based alloys) – Polymeric implant materials (Polyamides, polypropylene, Acrylic resins and Hydrogels) – Tissue replacement implants – Soft and hard tissue replacements – Skin implants – Tissue engineering – Biomaterials for organ replacement (Bone substitutes) – Biosensor.

UNIT IV–INTRODUCTION TO NANOSCIENCE AND NANOTECHNOLOGY (6 hours)

Basic concepts of Nanoscience and Nanotechnology – Quantum wire – Quantum well – Quantum dot – fullerenes – Graphene – Carbon nanotubes – Material processing by chemical vapor deposition and physical vapor deposition – Principle of SEM, TEM, AFM, Scanning near-field optical microscopy (SNOM) – Scanning ion-conducting microscopy (SCIM) – Potential uses of nanomaterials in electronics, robotics, computers, sensors, sports equipment, mobile electronic devices, vehicles and transportation – Medical applications of nanomaterials.

UNIT V–MATERIALS CHARACTERIZATION

(6 hours)

X-ray diffraction, Neutron diffraction and Electron diffraction– X-ray fluorescence spectroscopy – Fourier transform Infrared spectroscopy (FTIR) – Ultraviolet and visible spectroscopy (UV-vis) – Thermogravimetric Analysis (TGA) – Differential Thermal Analysis (DTA) – Differential Scanning Calorimetry (DSC).

PRACTICALS **(30 hours)**

1. Determination of resistivity and band gap for a semiconductor material – Four probe method / Post-office box
2. Determination of Hall coefficient for a semiconducting material
3. To study V-I characteristics of a light dependent resistor (LDR)
4. Determination of energy loss in a magnetic material – B-H curve
5. Determination of paramagnetic susceptibility – Quincke's method
6. Determination of dielectric constant for a given material
7. Calculation of lattice cell parameters – X-ray diffraction
8. Measurement of glucose concentration – Electrochemical sensor
9. Visit to Advanced Material Characterization Laboratory (Optional)

REFERENCES

1. Rolf E. Hummel, "*Electronic Properties of Materials"*, Springer, New York, 4th ed., 2011
2. Dennis W. Prather, "*Photonic Crystals: Theory, Applications, and Fabrication"*, John Wiley & Sons, Hoboken, 2009
3. James R. Janesick, "*Scientific Charge-Coupled Devices",* Published by SPIE - The International Society for Optical Engineering, Bellingham, Washington, 2001
4. David M. Pozar, "*Microwave Engineering*", John Wiley & Sons, 3rd ed., 2005
5. F. Silver and C. Dillion, "*Biocompatibility: Interactions of Biological and Implantable Materials*", VCH Publishers, New york, 1989

6. Severial Dumitriu, "*Polymeric Biomaterials*" Marcel Dekker Inc, CRC Press, Canada 2001
7. G. Cao, "*Nanostructures and Nanomaterials: Synthesis, Properties and Applications*", Imperial College Press, 2004.
8. T.Pradeep, "*A text book of Nanoscience and Nanotechnology"*, Tata McGraw Hill, New Delhi, 2012.
9. Sam Zhang, "*Materials Characterization Techniques*", CRC Press, 2008

PY1003 MATERIALS SCIENCE												
Course designed by		**Department of Physics and Nanotechnology**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X	X		X	X						X
2	Mapping of instructional objectives with student outcome	1	5		4	2						3
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
				X								
4	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
CY1003	**PRINCIPLES OF ENVIRONMENTAL SCIENCE**	**2**	**0**	**0**	**2**
	Total Contact hours - 30				
	Prerequisite				
	Nil				
PURPOSE					
The course provides a comprehensive knowledge in environmental science,					

environmental issues and the management.	
INSTRUCTIONAL OBJECTIVES	
	To gain knowledge on the importance of environmental education and ecosystem.
	To acquire knowledge about environmental pollution- sources, effects and control measures of environmental pollution.
	To understand the treatment of wastewater and solid waste management.
	To acquire knowledge with respect to biodiversity, its threats and its conservation and appreciate the concept of interdependence.
	To be aware of the national and international concern for environment for protecting the environment

UNIT I - ENVIRONMENTAL EDUCATION AND ECOSYSTEMS (6 hours)

Environmental education: Definition and objective. Structure and function of an ecosystem – ecological succession –primary and secondary succession - ecological pyramids – pyramid of number, pyramid of energy and pyramid of biomass.

UNIT II - ENVIRONMENTAL POLLUTION (6 hours)

Environmental segments – structure and composition of atmosphere - Pollution – Air, water, soil , thermal and radiation – Effects – acid rain, ozone layer depletion and green house effect – control measures – determination of BOD, COD, TDS and trace metals.

UNIT III - WASTE MANAGEMENT (6 hours)

Waste water treatment (general) – primary, secondary and tertiary stages.
Solid waste management: sources and effects of municipal waste, bio medical waste - process of waste management.

UNIT IV - BIODIVERSITY AND ITS CONSERVATION (6 hours)

Introduction: definition - genetic, species and ecosystem diversity – bio diversity hot spots - values of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - threats to biodiversity: habitat loss, poaching of wildlife – endangered and endemic species of India, Conservation of biodiversity: in-situ and ex-situ conservations.

UNIT V - ENVIRONMENTAL PROTECTION (6 hours)

National concern for environment: Important environmental protection acts in India – water, air (prevention and control of pollution) act, wild life conservation and forest act – functions of central and state pollution control boards - international effort – key initiatives of Rio declaration, Vienna convention, Kyoto protocol and Johannesburg summit.

REFERENCES

1. De.A.K., "*Environmental Chemistry"*, New Age International, New Delhi, 1996.
2. Kamaraj.P & Arthanareeswari.M, "*Environmental Science – Challenges and Changes"*, , Sudhandhira Publications, 4th Edition 2010.
3. Sharma.B.K. and Kaur, "*Environmental Chemistry",* Goel Publishing House, Meerut, 1994.
4. Dara S.S., "*A Text Book of Environmental Chemistry and pollution control",* S.Chand & Company Ltd., New Delhi, 2004.
5. Jeyalakshmi.R, "*Principles of Environmental Science"*,Devi Publications, Chennai,1st Edition ,2006.
6. Helen P Kavitha, "*Principles of Environmental Science*", Sci tech Publications, 2nd Edition , 2008.

CY1003 – PRINCIPLES OF ENVIRONMENTAL SCIENCE												
Course designed by		**Department of Chemistry**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
				x		**x**	**x**		**x**	**x**	**x**	
2	Mapping of instructional objective with student outcome			**5**		**2**	**4**		**1,3**	**3**	**2, 5**	
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)	
					x							
4	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
IT1002	**IT FUNDAMENTALS**	**2**	**0**	**0**	**2**

	Total Contact hours - 30				
	Prerequisite				
	Nil				

PURPOSE

Any discipline of engineering, when learned through formal education programs, necessitates having a specially designed course which covers the fundamentals of various focus areas of that discipline. With this in mind, the course on IT fundamentals is designed to provide the students with fundamental know how's of different topics in Information Technology in addition to stressing the need for interpersonal skills development.

INSTRUCTIONAL OBJECTIVES

1.	Describe the components of IT systems and their interrelationships
2.	Describe the relationship between IT and other computing disciplines
3.	Describe the elements of an IT application and Business process integration
4.	Develop and follow the professional skills that are expected out of an IT professional
5.	Understand the application domain of IT

UNIT I-PERVASIVE THEMES IN IT (8 hours)

Components of IT Systems (Hardware, Software, Networks, User) - Data and Information - Information Management – ICT - Networking - Programming – HCI design principles - Web and Multimedia foundations – Information Assurance and Security

UNIT II-IT AND ITS RELATED DISCIPLINES (5 hours)

Problem Space of Computing - Computing Disciplines – Definition of IT - Relationship between IT and other computing disciplines - Relationship between IT and non computing disciplines

UNIT III-ORGANIZATIONAL ISSUES (7 hours)

Emergence of complexity in IT – Tools and Techniques to handle complexity – Elements of an IT application – Business Processes - Project Management - Cost Benefit Analysis - Integration of Processes

UNIT IV-IT AS A (5 hours)

Professionalism–Responsibility - Interpersonal Skills - Life-long Learning-Computing Ethics - Crime, Law, Privacy and Security

UNIT V-APPLICATION DOMAIN (5 hours)

Medical Applications- Business Applications- Law Enforcement and Political Processes- E-commerce- Manufacturing- Education- Entertainment – Agriculture–BioInformatics

TEXT BOOK

1. Compilation Notes, Department of Information Technology, SRM University

REFERENCES

1. Brian.K.Williams, Stacey.C.Sawyer,*Using Information Technology – A Practical Introduction to Computers and Communication*, Tata McGraw Hill Publishing Company Ltd., New Delhi, 6th Education, 2005.
2. Jedlicka.L, *Computers in Our World*, Thompson Course Technologies, 2003
3. Shelley.G, Vermaat.M, Cashman.T, *Discovering Computers 2005: A Gateway to Information*, Thompson Course Technologies, 2005

<table>
<tr><th colspan="13">IT1002 IT FUNDAMENTALS</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="11">Department of Information Technology</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student Outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td colspan="2">g</td><td>h</td><td>i</td><td>j</td><td>k</td></tr>
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<tr><td>2</td><td>Mapping of instructional objectives with student outcome</td><td></td><td></td><td></td><td></td><td></td><td>4</td><td colspan="2">1
2
3
5</td><td>4</td><td></td><td></td><td></td></tr>
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<tr><td colspan="2"></td><td colspan="4"></td><td colspan="3"></td><td colspan="2">X</td><td></td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Broad Area (for courses under ‘P’ only)</td><td colspan="2">Programming</td><td colspan="4">Networking</td><td>Data base</td><td>Web System</td><td colspan="2">Human Computer Interaction</td><td>Platform Technologies</td></tr>
<tr><td colspan="2">X</td><td colspan="4">X</td><td>X</td><td>X</td><td colspan="2">X</td><td></td></tr>
<tr><td>5</td><td>Approval</td><td colspan="11">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
IT1003	**PROGRAM DESIGN AND**	**2**	**0**	**2**	**3**

	DEVELOPMENT USING C				
	Total contact hours – 60				
	Prerequisite				
	Nil				

PURPOSE
Knowledge of problem solving and programming concepts is essential for those who develop applications for users. Hence to provide the required knowledge, this course imparts basic knowledge in C programming along with the concepts of design and development of programs using C.

INSTRUCTIONAL OBJECTIVES	
1.	Gain knowledge about problem solving in computers
2.	Understand the basic components and structure of a C program
3.	Develop proficiency in basic programming skills

UNIT I-INTRODUCTION TO PROBLEM SOLVING AND PROGRAMMING (5 hours)

Creative thinking and problem solving skills, visualization and memory - Problem Solving Concepts - Problem Solving in everyday life, types of problems, problem solving concepts for computers, Algorithms and Flow charts; Programming Concepts -preprocessing, compilation, assembling and linking.

UNIT II-OVERVIEW OF C (8 hours)

Structure of C program, constants, variables and data types, operators and expressions – arithmetic operators, bitwise operators, evaluation of expressions, precedence of operators and associativity, mathematical functions –Managing Input/Output Operations – Decision making and branching structures –Looping structures

UNIT III-FUNCTIONS (4 hours)

User defined functions and its elements - definition of functions - return values and their types - function calls - function declaration - types of functions - scope, visibility of variables in functions - recursion - structures and functions.

UNIT IV-ARRAYS, STRUCTURES AND UNIONS (8 hours)

Arrays: single dimensional, two dimensional and multi-dimensional arrays, dynamic arrays - character arrays and strings – string handling functions -

structures and unions – accessing structure members, arrays within structures, arrays of structures, structures within structures

UNIT V-POINTERS (5 hours)

Pointers, declaration, passing pointers to functions, accessing a variable, character strings, pointers to functions and structures; Introduction to shell programming

LIST OF EXERCISES (30 hours)

1. Programs to demonstrate the use of scanf( ) and printf( ) functions
2. Programs to evaluate arithmetic expressions
3. Programs using conditional statements
4. Programs using for-while - do…while
5. Programs on arrays
6. Programs to perform matrix addition and multiplication
7. Programs to implement functions
8. Programs to illustrate recursion
9. Programs to Illustrate pointers

TEXT BOOK

1. Maureen Sprankle, "*Problem Solving and Programming Concepts*", Pearson,7th Edition, 2011
2. E.Balagurusamy,"*Programming in ANSI C"*, Tata McGrawHill, 5thEdition, 2011.

REFERENCES

1. Y.P. Kanetkar, "*Let us C*", BPB Publications, 8th Edition, 2008.
2. Steve Oualline, " *Practical C Programming*", O'Reilly Publishers, 2011.
3. Byron Gottfried, "*Programming with C*", Schaum's Outline Series, 2nd Edition, 2000.

IT1002 IT FUNDAMENTALS												
Course designed by		**Department of Information Technology**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X		X						X		
2	Mapping of instructional	1		2						3		

	objectives with student outcome										
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)			
								X			
4	Broad Area (for courses under 'P' only)	Programming		Net working		Data base	Web System	Human Computer Interaction		Platform Technologies	
		X									
5	Approval	23rd meeting of Academic Council, May 2013									

COURSES WHICH CAN BE REGISTERED FOR EITHER IN I OR II SEMESTER

		L	T	P	C
LE1001	**ENGLISH**	**1**	**0**	**2**	**2**
	Total contact hours -45				
	Prerequisite				
	Nil				

PURPOSE

To help students achieve proficiency in English and develop their professional communication skills to meet the demand in the field of global communication to enable them to acquire placement anywhere with ease and confidence.

INSTRUCTIONAL OBJECTIVES

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

UNIT I-INVENTIONS **(9 hours)**

A. Grammar and Vocabulary – Tense and Concord:

B. Listening and Speaking – Common errors in Pronunciation (Individual sounds); Process description (Describing the working of a machine, and the manufacturing process)

C. Writing – Interpretation of data (Flow chart, Bar chart)

D. Reading -- (Reading Comprehension -- Answering questions)

UNIT II-ECOLOGY (9 hours)

A. Grammar and Vocabulary – Error Analysis – Synonyms and Antonyms, Parallelisms
B. Listening and Speaking - Conducting Meetings
C. Writing – Notice, Agenda, Minutes , letters to the editor via email : Email etiquette
D. D Reading Comprehension – Summarizing and Note-making

UNIT III-SPACE (9 hours)

A. Grammar and Vocabulary – tense and concord; word formation
B. Listening and Speaking – Distinction between native and Indian English (Speeches by TED and Kalam) – accent, use of vocabulary and rendering;
C. Writing – Definitions and Essay writing
D. Reading Comprehension – Predicting the content

UNIT IV-CAREERS (9 hours)

A. Grammar and Vocabulary –Homonyms and Homophones
B. Listening and Speaking – – Group Discussion
C. Writing Applying for job, cover letter and resume
D. Reading, etymology (roots ; idioms and phrases), Appreciation of creative writing.

UNIT V-RESEARCH (9 hours)

A. Grammar and Vocabulary – Using technical terms, Analogies
B. Listening and Speaking -- Presentation techniques (Speech by the learner)
C. Writing – Project Proposal
D. Reading Comprehension -- Referencing Skills for Academic Report Writing (Research Methodology – Various methods of collecting data) Writing a report based on MLA Handbook

REFERENCES

1. Department of English and Foreign Languages *English for Engineers*, SRM University Publications,2013
2. Dhanavel, S.P,"*English and Communication Skills for Students of Science and Engineering"*. Units 1-5. Chennai: Orient Blackswan Ltd 2009

3. Meenakshi Raman and Sangeetha Sharama ,"*Technical Communication-Principles and Practice*", Oxford University Press. 2009.
4. Day, R A "*Scientific English: A Guide for Scientists and Other Professionals*",2nd ed. Hyderabad: Universities Press,2000.

LE1001 ENGLISH												
Course designed by		**Department of English and Foreign Languages**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
2	Mapping of instructional objectives with student outcome							**1-5**				
3	Category	General (G)		Basic Sciences (B)				Engineering Sciences and Technical Arts (E)		Professional Subjects (P)		
		X										
5	Approval	23rd meeting of Academic Council, May 2013										

		L	**T**	**P**	**C**
LE1002	**VALUE EDUCATION**	**1**	**0**	**0**	**1**
	Total contact hours- 15				
	Prerequisite				
	Nil				

PURPOSE

To provide guiding principles and tools for the development of the whole person recognizing that the individual is comprised of Physical, Intellectual, Emotional and Spiritual dimensions.

INSTRUCTIONAL OBJECTIVES

1.	To help individuals think about and reflect on different values.
2.	To deepen understanding, motivation and responsibility with regard to making personal and social choices and the practical implications of expressing them in relation to themselves, others, the community and the world at large
3.	To inspire individuals to choose their own personal, social, moral and

	spiritual values and be aware of practical methods for developing and deepening

UNIT I –INTRODUCTION (3 hours)

Definition, Relevance, Types of values, changing concepts of values

UNIT II- INDIVIDUAL AND GROUP (3 hours)

Personal values – Self – Strengths (self-confidence, self-assessment, self-reliance, self-discipline, determination, self-restraint, contentment, humility, sympathy and compassion, gratitude, forgiveness) Weaknesses (Influences -- Peer pressure, familial and societal expectations, media)

UNIT III-SOCIETIES IN (3 hours)

Definition of society; Units of society; Communities – ancient and modern – Agents of change – Sense of survival, security, desire for comfort and ease sense of belonging, social consciousness and responsibility

UNIT IV-ENGINEERING ETHICS (3 hours)

Definition - Societies for engineers – Code of Ethics – Ethical Issues involved in cross border research -- Ethical and Unethical practices – case studies – situational decision making

UNIT V-SPIRITUAL VALUES (3 hours)

What is religion? -- Role of religion – Misinterpretation of religion – moral policing – Consequences -- Religion as spiritual quest – Aesthetics and religion

REFERENCES

1. Department of English and Foreign Languages SRM University. 2013 *Rhythm of Life* **.** SRM University Publications.
2. Values **(**Collection of Essays)., 1996. Published by : Sri Ramakrishna Math, Chennai-4.

LE1002 VALUE EDUCATION												
Course designed by		**Department of English and Foreign Languages**										
1	Student outcome	a	b	c	d	e	f	g	h	i	J	k
							x			**x**		
2	Mapping of instructional objectives with student outcome						**1 - 3**			**1-3**		

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)	Professional Subjects (P)
		x			
4	Approval	23rd meeting of Academic Council, May 2013			

		L	T	P	C
CS1001	**PROGRAMMING USING MATLAB**	**1**	**0**	**2**	**2**
	Total Contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

This Lab Course will enable the students to understand the fundamentals and programming knowledge in MATLAB.

INSTRUCTIONAL OBJECTIVES

	To learn the MATLAB environment and its programming fundamentals
	Ability to write Programs using commands and functions
	Able to handle polynomials, and use 2D Graphic commands

LIST OF EXPERIMENTS

1. Practicing MATLAB environment with simple exercises to familiarize Command Window, History, Workspace, Current Directory, Figure window, Edit window, Shortcuts, Help files.
2. Data types, Constants and Variables, Character constants, operators, Assignment statements.
3. Control Structures: For loops, While, If control structures, Switch, Break, Continue statements.
4. Input-Output functions, Reading and Storing Data.
5. Vectors and Matrices, commands to operate on vectors and matrices, matrix Manipulations.
6. Arithmetic operations on Matrices, Relational operations on Matrices, Logical operations on Matrices.
7. Polynomial Evaluation, Roots of Polynomial, Arithmetic operations on Polynomials.
8. Graphics: 2D plots, Printing labels, Grid & Axes box, Text in plot, Bar and Pie chart.

REFERENCES

1. R.K.Bansal, A.K.Goel, M.K.Sharma, "*MATLAB and its Applications in Engineering*", Pearson Education, 2012.

2. Amos Gilat, *"MATLAB-An Introduction with Applications"*, Wiley India, 2009.
3. Stephen.J.Chapman, *"Programming in MATLAB for Engineers"*, Cengage Learning, 2011.

CS1001 PROGRAMMING USING MATLAB												
Course designed by		**Department of Computer Science and Engineering**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
		x	**x**									**x**
2	Mapping of instructional objective with student outcome	**2,3**	**1,2,3**									**1**
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)					Professional Subjects (P)	
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	**T**	**P**	**C**
BT1001	**BIOLOGY FOR ENGINEERS**	**2**	**0**	**0**	**2**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				

PURPOSE

The purpose of this course is to provide a basic understanding of biological mechanisms of living organisms from the perspective of engineers. In addition, the course is expected to encourage engineering students to think about solving biological problems with engineering tools.

INSTRUCTIONAL OBJECTIVES

1.	To familiarize the students with the basic organization of organisms and subsequent building to a living being
2.	To impart an understanding about the machinery of the cell functions that is ultimately responsible for various daily activities.
3.	To provide knowledge about biological problems that require engineering expertise to solve them

UNIT I-BASIC CELL BIOLOGY (6 hours)

Introduction: Methods of Science-Living Organisms: Cells and Cell theory Cell Structure and Function, Genetic information, protein synthesis, and protein structure, Cell metabolism-**Homoeostasis- Cell growth**, reproduction, and differentiation

UNIT II-BIOCHEMISTRY AND MOLECULAR ASPECTS OF LIFE (5 hours)

Biological Diversity --Chemistry of life: chemical bonds--Biochemistry and Human biology--Protein synthesis—Stem cells and Tissue engineering

UNIT III-ENZYMES AND INDUSTRIAL APPLICATIONS (5 hours)

Enzymes: Biological catalysts, Proteases, Carbonic anhydrase, Restriction enzymes, and Nucleoside monophosphate kinases—**Photosynthesis**

UNIT I-MECHANOCHEMISTRY (7 hours)

Molecular Machines/Motors—Cytoskeleton—Bioremediation—Biosensors

UNIT V-NERVOUS SYSTEM, IMMUNE SYSTEM, AND CELL SIGNALING (7 hours)

Nervous system--Immune system- General principles of cell signaling

REFERENCES

1. S. ThyagaRajan, N. Selvamurugan, M. P. Rajesh, R. A. Nazeer, Richard W. Thilagaraj, S. Barathi, and M. K. Jaganthan, "*Biology for Engineers*," Tata McGraw-Hill, New Delhi, 2012.
2. Jeremy M. Berg, John L. Tymoczko and Lubert Stryer, "*Biochemistry*," W.H. Freeman and Co. Ltd., 6th Ed., 2006.
3. Robert Weaver, "*Molecular Biology*," MCGraw-Hill, 5th Edition, 2012,
4. Jon Cooper, "***Biosensors A Practical Approach*" Bellwether Books, 2**004
5. Martin Alexander, "*Biodegradation and Bioremediation,"* Academic Press, 1994
6. Kenneth Murphy, "*Janeway's Immunobiology*," Garland Science; 8th edition, 2011
7. Eric R. Kandel, James H. Schwartz, Thomas M. Jessell, "Principles of Neural Science, McGraw-Hill, 5th Edition, 2012

BT1001 BIOLOGY FOR ENGINEERS	
Course designed by	**Department of Biotechnology**

1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X			X						X	
2	Mapping of instructional objectives with student outcome	1			2						3	
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)	
					X							
4	Approval	23rd meeting of Academic Council, May 2013										

CE1001	BASIC CIVIL ENGINEERING	L	T	P	C
		2	0	0	2
	Total contact hours - 30				
	Prerequisite				
	Nil				

PURPOSE

To get exposed to the glimpses of Civil Engineering topics that is essential for an Engineer.

INSTRUCTIONAL OBJECTIVES

1.	To know about different materials and their properties
2.	To know about engineering aspects related to buildings
3.	To know about importance of surveying and the transportation systems
4.	To get exposed to the rudiments of engineering related to dams, water supply, and sewage disposal

UNIT I-BUILDING MATERILAS (6 hours)

Introduction – Civil Engineering – Materials: Bricks – composition – classifications – properties –uses. Stone – classification of rocks – quarrying – dressing –properties –uses. Timber - properties –uses –ply wood. Cement – grades –types – properties –uses. Steel – types – mild steel – medium steel – hard steel – properties – uses – market forms. Concrete – grade designation – properties – uses.

UNIT II-MATERIAL PROPERTIES (6 hours)

Stress – strain – types – Hook's law – three moduli of elasticity – poisons ratio – relationship – factor of safety. Centroid - center of gravity – problems in symmetrical sections only (I, T and channel sections). Moment of inertia, parallel, perpendicular axis theorems and radius of gyration (definitions only).

UNIT III-BUILDING COMPONENTS (6 hours)

Building – selection of site – classification – components. Foundations – functions – classifications – bearing capacity. Flooring – requirements – selection – types – cement concrete marble – terrazzo floorings. Roof – types and requirements.

UNIT IV-SURVEYING AND TRANSPORTATION (6 hours)

Surveying – objectives – classification – principles of survey. Transportation – classification – cross section and components of road – classification of roads. Railway – cross section and components of permanent way –functions. Water way – docks and harbor – classifications – components. Bridge – components of bridge.

UNIT V-WATER SUPPLY AND SEWAGE DISPOSAL (6 hours)

Dams – purpose – selection of site – types –gravity dam (cross section only). Water supply – objective – quantity of water – sources – standards of drinking water – distribution system. Sewage – classification – technical terms – septic tank – components and functions.

REFERENCES

1. Raju K.V.B., Ravichandran P.T., *Basics of Civil Engineering*, Ayyappa Publications, Chennai, 2012
2. Ramesh Babu, *Civil Engineering* , VRB Publishers, Chennai, 2000
3. Rangwala,S.C., *Engineering Materials*, Charotar Publishing House, Anand, 2012
4. National Building Code of India, Part V, *Building Materials*, 2005
5. Surendra Singh, *Building Materials*, Vikas Publishing Company, New Delhi, 1996

CE1001 BASIC CIVIL ENGINEERING												
Course designed by		**Department of Civil Engineering**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
		x				**x**						**x**
2	Mapping of	1 -				1						2

	instructional objectives with student outcome	4				- 4						- 4
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
							x					
4	Broad area (for 'P'category)	Structural Engineering		Geotechnical Engineering			Water Resources Engineering			Geomatics Engineering		
		-		-			-			-		
5	Approval	23rd meeting of academic council , May 2013										

		L	T	P	C
ME1001	**BASIC MECHANICAL ENGINEERING**	**2**	**0**	**0**	**2**
	Total contact hours - 30				
	Prerequisite				
	Nil				
PURPOSE					
To familiarize the students with the basics of Mechanical Engineering.					
INSTRUCTIONAL OBJECTIVES					
1.	To familiarize with the basic machine elements				
2.	To familiarize with the Sources of Energy and Power Generation				
3.	To familiarize with the various manufacturing processes				

UNIT I-MACHINE ELEMENTS

Springs: Helical and leaf springs – Springs in series and parallel. **Cams:** Types of cams and followers – Cam profile.

Power Transmission: Gears (terminology, spur, helical and bevel gears, gear trains). Belt drives (types). Chain drives. **Simple Problems.**

UNIT II-ENERGY

Sources: Renewable and non-renewable (various types, characteristics, advantages/disadvantages). **Power Generation:** External and internal combustion engines – Hydro, thermal and nuclear power plants (layouts, element/component description, advantages, disadvantages, applications). **Simple Problems.**

UNIT III-MANUFACTURING PROCESSES

Sheet Metal Work: Introduction – Equipments – Tools and accessories – Various processes (applications, advantages / disadvantages). **Welding:** Types – Equipments – Tools and accessories – Techniques employed - applications, advantages / disadvantages – Gas cutting – Brazing and soldering. **Lathe Practice:** Types - Description of main components – Cutting tools – Work holding devices – Basic operations. **Simple Problems**. **Drilling Practice:** Introduction – Types – Description – Tools. S**imple Problems**.

REFERENCES

1. Kumar, T., Leenus Jesu Martin and Murali, G.," *Basic Mechanical Engineering"*, Suma Publications, Chennai,2007.
2. Prabhu, T. J., Jai Ganesh, V. and Jebaraj, S., "*Basic Mechanical Engineering"*, Scitech Publications, Chennai, 2000.
3. Hajra Choudhary, S.K. and HajraChoudhary, A. K., "*Elements of Workshop TechnologyVols. I & II"*, Indian Book Distributing Company Calcutta, 2007.
4. Nag, P.K.," *Power Plant Engineering"*, Tata McGraw-Hill, New Delhi, 2008.
5. Rattan, S.S., "*Theory of Machines"*, Tata McGraw-Hill, New Delhi, 2010.

ME1001 BASIC MECHANICAL ENGINEERING												
Course designed by		**Department of Mechanical Engineering**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X				X						
2	Mapping of instructional objectives with student outcome	1, 2, 3				1, 2, 3						
3	Category	General (G)	Basic Sciences (B)			Engineering Sciences and Technical Art (E)			Professional Subjects (P)			

				X	
4	Approval	23rd meeting of the Academic Council , May 2013			

		L	T	P	C
EE1001	**BASIC ELECTRICAL ENGINEERING**	**2**	**0**	**0**	**2**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				

PURPOSE

This course provides comprehensive idea about circuit analysis, working principles of machines and common measuring instruments.

INSTRUCTIONAL OBJECTIVES

1.	Understand the basic concepts of magnetic circuits, AC & DC circuits.
2.	Explain the working principle, construction, applications of DC & AC machines and measuring instruments.
3.	Gain knowledge about the fundamentals of wiring and earthing

UNIT I –FUNDAMENTALS OF DC CIRCUITS (6 hours)

Introduction to DC and AC circuits, Active and passive two terminal elements, Ohms law, Voltage-Current relations for resistor, inductor, capacitor , Kirchhoff's laws, Mesh analysis, Nodal analysis, Ideal sources – equivalent resistor, current division, voltage division

UNIT II–MAGNETIC CIRCUITS (6 hours)

Introduction to magnetic circuits-Simple magnetic circuits-Faraday's laws, induced emfs and inductances

UNIT III–AC CIRCUITS (6 hours)

Sinusoids, Generation of AC, Average and RMS values, Form and peak factors, concept of phasor representation, J operator. Analysis of R-L, R-C, R-L-C circuits. Introduction to three phase systems - types of connections, relationship between line and phase values.

UNIT IV–ELECTRICAL MACHINES & MEASURING INSTRUMENTS (6 hours)

Working principle, construction and applications of DC machines and AC machines (1 - phase transformers, single phase induction motors: split phase, capacitor start and capacitor start & run motors).
Basic principles and classification of instruments -Moving coil and moving iron instruments .

UNIT V–ELECTRICAL SAFETY, WIRING &INTRODUCTION TO POWER SYSTEM (6 hours)

Safety measures in electrical system- types of wiring- wiring accessories- staircase, fluorescent lamps & corridor wiring- Basic principles of earthing- Types of earthing- Simple layout of generation, transmission & distribution of power.

REFERENCES

1. Smarajt Ghosh, "*Fundamentals of Electrical & Electronics Engineering*", Second edition, PHI
2. Learning, 2007
3. V.K.Metha, Rohit Metha, "*Basic Electrical Engineering*" Fifth edition, S.Chand & Co, 2012
4. Kothari D. P and Nagrath IJ, "*Basic Electrical Engineering*", Second edition, Tata McGraw - Hill, 2009
5. S. K. Bhattacharya, "*Basic Electrical and Electronics Engineering"*, First edition, Pearson Education,2011

EE1001 BASIC ELECTRICAL ENGINEERING												
Course designed by		**Department of Electrical and Electronics Engineering**										
1	Student outcomes	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
		x				**x**						
2	Mapping of instructional objectives with student outcome	1,2,3				1						
3	Category	General (G)			Basic Sciences (B)		Engineering Sciences and Technical Arts(E)			Professional Subjects(P)		

				x	
4	Approval	23rd meeting of Academic Council, May 2013			

		L	T	P	C
EC1001	**BASIC ELECTRONICS ENGINEERING**	**2**	**0**	**0**	**2**
	Total Contact Hours – 30				
	Prerequisite				
	Nil				

PURPOSE

This course provides comprehensive idea about working principle, operation and characteristics of electronic devices, transducers, Digital Electronics and Communication Systems.

INSTRUCTIONAL OBJECTIVES

At the end of the course students will be able to gain knowledge about the

	Fundamentals of electronic components, devices, transducers,
	Principles of digital electronics, and
	Principles of various communication systems

UNIT I-ELECTRONIC COMPONENTS (4 hours)

Passive components – resistors, capacitors & inductors (properties, common types, I-V relationship and uses).

UNIT II-SEMICONDUCTOR DEVICES (7 hours)

Semiconductor Devices - Overview of Semiconductors - basic principle, operation and characteristics of PN diode, zener diode, BJT, JFET, optoelectronic devices (LDR, photodiode, phototransistor, solar cell, optocouplers)

UNIT III –TRANSDUCERS (5 hours)

Transducers - Instrumentation – general aspects, classification of transducers, basic requirements of transducers, passive transducers - strain gauge, thermistor, Hall-Effect transducer, LVDT, and active transducers – piezoelectric and thermocouple.

UNIT IV-DIGITAL ELECTRONICS (7 hours)

Number systems – binary codes - logic gates - Boolean algebra, laws & theorems - simplification of Boolean expression - implementation of Boolean expressions using logic gates - standard forms of Boolean expression.

UNIT V-COMMUNICATION SYSTEMS (7 hours)

Block diagram of a basic communication system – frequency spectrum - need for modulation - methods of modulation - principles of AM, FM, pulse

analog and pulse digital modulation – AM / FM transmitters & receivers (block diagram description only)

REFERENCES

1. T. Thyagarajan, K.P. SendurChelvi, T.R. Rangaswamy, *"Engineering Basics: Electrical, Electronics and Computer Engineering"*, New Age International, Third Edition, 2007.
2. B. Somanathan Nair, S.R. Deepa, "*Basic Electronics",* I.K. International Pvt. Ltd., 2009.
3. Thomas L. Floyd, *"Electronic Devices",* Pearson Education, 9th Edition, 2011.
4. R.K. Rajput, *"Basic Electrical and Electronics Engineering"*, Laxmi Publications, First Edition, 2007.

EC1001 BASIC ELECTRONICS ENGINEERING												
Course designed by		**Department of Electronics and Communication Engineering**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
		X										
2	Mapping of instructional objectives with student outcome	1,2,3										
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences & Technical Arts (E)			Professional Subjects (P)		
							X					
4	Approval	23rd meeting of Academic Council, May 2013										

		L	**T**	**P**	**C**
ME1005	**ENGINEERING GRAPHICS**	**1**	**0**	**4**	**3**
	Total contact hours - 75				
	Prerequisite				
	Nil				

PURPOSE	
1. To draw and interpret various projections of 1D, 2D and 3D objects.	
2. To prepare and interpret the drawings of buildings.	
INSTRUCTIONAL OBJECTIVES	
1.	To familiarize with the construction of geometrical figures
2.	To familiarize with the projection of 1D, 2D and 3D elements
3.	To familiarize with the sectioning of solids and development of surfaces
4.	To familiarize with the Preparation and interpretation of building drawing

UNIT I-FUNDAMENTALS OF ENGINEERING GRAPHICS (2 hours)

Lettering – Two dimensional geometrical constructions – Conics – Representation of three-dimensional objects – Principles of projections – Standard codes – Projection of points.

UNIT II-PROJECTION OF LINES AND SOLIDS (4 hours)

Projection of straight lines – Projection of planes - Projection of solids – Auxiliary projections.

UNIT III-SECTIONS AND DEVELOPMENTS (3 hours)

Sections of solids and development of surfaces.

UNIT IV-PICTORIAL PROJECTIONS (4 hours)

Conversion of Projections: Orthographic projection – Isometric projection of regular solids and combination of solids.

UNIT V-BUILDING DRAWING (2 hours)

Plan, Elevation and section of single storied residential (or) office building with flat RCC roof and brick masonry walls having not more than 3 rooms (planning / designing is not expected in this course) with electrical wiring diagram.

PRACTICAL (60 hours)

REFERENCES

1. Venugopal, K. and Prabhu Raja, V, "*Engineering Graphic"s*, Eighth Edition (Revised), New Age International Publishers, Chennai, 2007.
2. Natarajan, K.V., "*A Text Book of Engineering Graphics"*, 21st Edition, Dhanalakshmi Publishers, Chennai, 2012.
3. Jeyapoovan, T., "*Engineering Drawing and Graphics using AutoCAD"*, Vikas Publishing House Pvt. Ltd., New Delhi, 2010.

4. Bethune, J.D., "*Engineering Graphics with AutoCAD* 2013", PHI Learning Private Limited, Delhi, 2013.
5. Bhatt, N.D., "*Elementary Engineering Drawing (First Angle Projection")*, Charotar Publishing Co., Anand, 1999.
6. Narayanan, K. L. and Kannaiah, P., "*Engineering Graphics"*, Scitech Publications, Chennai, 1999.
7. Shah, M. B. and Rana, B. C., "*Engineering Drawing"*, Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2005.

ME1005 ENGINEERING GRAPHICS												
Course designed by		**Department of Mechanical Engineering**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	K
			×	×				×				
2	Mapping of instructional objectives with student outcome		1, 2, 3, 4	1, 2, 3, 4				1, 2, 3, 4				
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences And Technical Art (E)				Professional Subjects (P)		
						X						
4	Approval	23rd meeting of the Academic Council , May 2013										

		L	**T**	**P**	**C**
IT1001	**COMPUTER HARDWARE AND TROUBLESHOOTING LAB**	**0**	**0**	**4**	**2**
	Total contact hours - 60				
	Prerequisite				
	Nil				
PURPOSE					
This course is designed to enable the students to get a detailed knowledge of all the hardware components that make up a computer and to understand the					

different interfaces required for connecting these hardware devices.	
INSTRUCTIONAL OBJECTIVES	
1.	To understand the components on the motherboard
2.	To perform system administration tasks
3.	To understand different storage media
4.	To understand system related problems and methods of troubleshooting

LIST OF EXPERIMENTS (60 hours)

1. Study and identification of standard desktop personal computer
2. Understanding of Motherboard and its interfacing components
3. Install and configure computer drivers and system components.
4. Disk formatting, partitioning and Disk operating system commands
5. Install, upgrade and configure Windows operating systems.
6. Remote desktop connections and file sharing.
7. Identify, install and manage network connections Configuring IP address and Domain name system
8. Install, upgrade and configure Linux operating systems.
9. Installation Antivirus and configure the antivirus.
10. Installation of printer and scanner software.
11. Disassembly and Reassembly of hardware.
12. Troubleshooting and Managing Systems

TEXT BOOK

1. B.Govindarajulu, "*IBM PC and Clones hardware trouble shooting and maintenance*", Tata McGraw-Hill, New Delhi, 2002.

REFERENCES

1. Craig Zacker& John Rourke, "*The complete reference:PC hardware*", Tata McGraw-Hill, New Delhi, 20012.
2. Mike Meyers, "*Introduction to PC Hardware and Troubleshooting*", Tata McGraw-Hill, New Delhi, 2003.

IT1001 COMPUTER HARDWARE AND TROUBLESHOOTING LAB															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
										X		X			
2	Mapping of									2		134			

	instructional objectives with student outcome														
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming			Networking		Data base		Web System		Human Computer Interaction		Platform Technologies		
					X										
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
NC1001/ NS1001/ SP1001/ YG1001	**NATIONAL CADET CORPS (NCC)/ NATIONAL SERVICE SCHEME (NSS)/ NATIONAL SPORTS ORGANIZATION (NSO) / YOGA**	**0**	**0**	**1**	**1**
	Total Contact Hours – 15 (minimum, but may vary depending on the course)				
	Prerequisite				
	Nil				
PURPOSE					
To imbibe in the minds of students the concepts and benefits of NCC/NSS/NSO/YOGA and make them practice the same					
INSTRUCTIONAL OBJECTIVES					
1.	To enable the students to gain knowledge about NCC/NSS/NSO/YOGA and put the same into practice				

NATIONAL CADET CORPS (NCC)

Any student enrolling as a member of National Cadet Core (NCC) will have to attend sixteen parades out of twenty parades each of four periods over a span of academic year.

Attending eight parades in first semester will qualify a student to earn the credits specified in the curriculum. Grading shall be done based on punctuality, regularity in attending the parades and the extent of active involvement.

NATIONAL SERVICE SCHEME (NSS)

A student enrolling as member of NSS will have to complete 60 hours of training / social service to be eligible to earn the credits specified in the curriculum.

Grading shall be done by the faculty member handling the course based on punctuality, regularity in attending the classes and the extent of active involvement.

NATIONAL SPORTS ORGANIZATION (NSO)

Each student must select one of the following games/sports events and practice for one hour per week. An attendance of 75% is compulsory to earn the credits specified in the curriculum. Grading shall be done by the faculty member handling the course based on punctuality, regularity in attending the classes and the extent of active involvement.

List of games/sports:

Basket Ball, Football, Volley Ball, Ball Badminton, Cricket, Throw-ball, Track events

Field events or any other game with the approval of faculty member.

YOGA

Benefits of Agnai Meditation -Meditation - Agnai, Asanas, Kiriyas, Bandas, Muthras

Benefits of santhi Meditation - Meditation Santhi Physical Exercises (I & II)

Lecture & Practice - Kayakalpa Yoga Asanas, Kiriyas, Bandas, Muthras

Analysis of Thought - Meditation Santhi Physical Exercises III & IV

Benefits of Thuriyam - Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras

Attitude - Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras

Importance of Arutkappy & Blessings - Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras

Benefits of Blessings - Meditation Santhi Kayakalpa Asanas, Kiriyas, Bandas, Muthras

Assessment

An attendance of 75% is compulsory to earn the credits specified in the curriculum. Grading shall be done by the faculty member handling the course based on punctuality, regularity in attending the classes and the extent of active involvement.

TEXT BOOKS

1. Yogiraj Vethathiri Maharishi, "*Yoga for Modern Age*", Vethathiri Publishers, 1989
2. Vethathiri Maharishi, T., "*Simplified Physical Exercises*", Vethathiri Publishers, 1987.

NC1001/ NS1001/ SP1001/ YG1001		**NATIONAL CADET CORPS (NCC)/ NATIONAL SERVICE SCHEME (NSS)/ NATIONAL SPORTS ORGANIZATION (NSO)/YOGA**										
Course designed by		**Department of Civil Engineering**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
2	Mapping of instructional objectives with student outcome				X					X		
3	Category	General (G)			Basic Sciences (B)		Engineering Sciences and Technical Arts (E)				Professional Subjects (P)	
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

SEMESTER III

		L	**T**	**P**	**C**
LE1003	**GERMAN LANGUAGE PHASE I**	**2**	**0**	**0**	**2**
	Total Contact Hours – 30				
	Prerequisite				
	Nil				

PURPOSE

Germany offers infinite opportunities for students of engineering for higher studies, research and employment in Germany. B.Tech Students are offered German Language during their second year. Knowledge of the language will be helpful for the students to adjust themselves when they go for higher studies.

INSTRUCTIONAL OBJECTIVES

1.	To introduce the language, phonetics and the special characters in German language

2.	To introduce German culture & traditions to the students.
3.	By the end of Phase – I, the students will be able to introduce themselves and initiate a conversation..
4.	We endeavor to develop the ability among the students to read and understand small texts written in German
5.	To enable the students to elementary conversational skills.

UNIT I **(6 Hours)**

Wichtige Sprachhandlungen: Phonetics – Sich begrüßen - Sich und andere vorstellen formell / informell - Zahlen von 1 bis 1 Milliarde - verstehen & sprechen.**Grammatik:** regelmäßige Verben im Präsens - "sein" und haben im Präsens - Personalpronomen im Nominativ

UNIT II **(6 Hours)**

Wichtige Sprachhandlungen Telefon Nummern verstehen und sprechen .Uhrzeiten verstehen und sagen Verneinung "nicht und kein" (formell und informell).**Grammatik** : Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/Nein Frage) Nomen buchstabieren und notieren bestimmter und unbestimmter Artikel und Negativartikel im Nom. & Akkusativ

UNIT III **(6 Hours)**

Wichtige Sprachhandlungen Tageszeiten verstehen und über Termine sprechen -Verabredungen verstehen - Aufgaben im Haushalt verstehen .**Grammatik** Personalpronomen im Akkusativ und Dativ - W-Fragen "wie, wer, wohin,wo, was usw.- Genitiv bei Personennamen - Modalverben im Präsens "können, müssen, möchten"

UNIT IV **(6 Hours)**

Wichtige Sprachhandlungen Sich austauschen, was man kann, muss – Bezeichnungen Lebensmittel – Mengenangaben verstehen – Preise verstehen und Einkaufzettel schreiben

Grammatik Wortstellung in Sätzen mit Modalverben – Konnektor "und" – "noch"- kein---mehr – "wie viel, wie viele, wie alt, wie lange" – Possessivartikel im Nominativ.

UNIT V **(6 Hours)**

Wichtige Sprachhandlungen Freizeitanzeigen verstehen – Hobbys und Sportarten Anzeigen für Freizeitpartner schreiben bzw. darauf antworten – Vorlieben und Abneigungen ausdrucken

Grammatik Verben mit Vokalwechsel im Präsens – Modalverben im Präsens " dürfen, wollen und mögen - "haben und sein" im Präteritum – regelmäßige Verben im Perfekt – Konnektoren "denn, oder, aber

REFERENCE

1. Studio d A1. Deutsch als Fremdsprache with CD.(Kursbuch und Sprachtraining).

LE1003 GERMAN LANGUAGE PHASE I												
Course designed by		**Department of English and Foreign Languages**										
1	Student outcome	a	b	c	d	e	f	g	H	i	j	k
								x				
2	Mapping of instructional objectives with student outcome							**1to5**				
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	**T**	**P**	**C**
LE1004	**FRENCH LANGUAGE PHASE I**	**1**	**0**	**2**	**2**
	Total contact hours - 30				
	Prerequisite				
	Nil				

PURPOSE

To enable the student learners acquire a basic knowledge of the French language and concepts of general French for everyday interactions and technical french at the beginner's level and also to get to know the culture of France .

INSTRUCTIONAL OBJECTIVES

1.	To enable students improve their grammatical competence.
2.	To enhance their listening skills.
3	To assist students in reading and speaking the language.
4.	To enhance their lexical and technical competence.
5.	To help the students introduce themselves and focus on their

	communication skills.

UNIT I **(6 hours)**

A. Grammar and Vocabulary: Usage of the French verb "se presenter", a verb of self- introduction and how to greet a person- "saluer"
B. Listening and Speaking – The authentic sounds of the letters of the French alphabet and the accents that play a vital role in the pronunciation of the words.
C. Writing – correct spellings of French scientific and technical vocabulary.
D. Reading -- Reading of the text and comprehension – answering questions.

UNIT II **(6 hours)**

A. rammar and Vocabulary – Definite articles , "prepositions de lieu" subject pron ouns
B. Listening and Speaking – pronunciation of words like Isabelle, presentez and la liaison – vous etes, vous appelez and role play of introducing each other – group activity
C. Writing – particulars in filling an enrollment / registration form
D. Reading Comprehension – reading a text of a famous scientist and answering questions.

UNIT III **(6 hours)**

A. Grammar and Vocabulary – verb of possession "avoir' and 1st group verbs "er", possessive adjectives and pronouns of insistence- moi, lui..and numbers from 0 to 20
B. Listening and Speaking –nasal sounds of the words like feminine, ceinture , parfum and how to ask simple questions on one's name, age, nationality, address mail id and telephone number.
C. Writing –conjugations of first group verbs and paragraph writing on self –introduction and introducing a third person.
D. Reading Comprehension – reading a text that speaks of one's profile and answering questions

UNIT IV **(6 hours)**

Grammar and Vocabulary –negative sentences, numbers from 20 to 69, verb "aimer"and seasons of the year and leisure activities.

A. Listening and Speaking – To express one's likes and dislikes and to talk of one's pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne

B. Writing- conjugations of the irregular verbs – faire and savoir and their usage. Paragraph writing on one's leisure activity- (passé temps favori)
C. Reading- a text on seasons and leisure activities – answering questions.

UNIT V **(6 hours)**

A. Grammar and Vocabulary – les verbes de direction- to ask one's way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs , a droite, la premiere a gauche and vocabulary relating to accommodation.
B. Listening and Speaking – to read and understand the metro map and hence to give one directions – dialogue between two people.
C. Writing –paragraph writing describing the accommodation using the different prepositions like en face de, derriere- to locate .
D. Reading Comprehension -- a text / a dialogue between two on location and directions- ou est la poste/ la pharmacie, la bibliotheque?.....

REFERENCES

1. French for Dummies.
2. French made easy-goyal publishers

LE1004 FRENCH LANGUAGE PHASE I												
Course designed by		**Department of English and Foreign Languages**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
								x				
2	Mapping of instructional objectives with student outcome							1 - 5				
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)				Professional Subjects (P)	
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
LE1005	**JAPANESE LANGUAGE PHASE I**	**2**	**0**	**0**	**2**
	Total contact hours- 30				
	Prerequisite				
	Nil				

PURPOSE	
To enable students achieve a basic exposure on Japan, Japanese language and culture. To acquire basic conversational skill in the language.	
INSTRUCTIONAL OBJECTIVES	
1.	To help students learn the Japanese scripts viz. hiragana and a few basic kanji.
2.	To make the students acquire basic conversational skill.
3	To enable students to know about Japan and Japanese culture.
4.	To create an advantageous situation for the students to have better opportunity for employability by companies who have association with Japan.

UNIT I **(8 hours)**

Introduction to Japanese language. Hiragana Chart 1 - vowels and consonants and related vocabulary.
Self introduction
Grammar – usage of particles wa, no, mo and ka and exercises
Numbers (1-100)
Kanji – introduction and basic kanjis – naka, ue, shita, kawa and yama
Greetings, seasons, days of the week and months of the year
Conversation – audio
Japan – Land and culture

UNIT II **(8 hours)**

Hiragana Chart 1 (contd.) and related vocabulary
Grammar – usage of kore, sore, are, kono, sono, ano, arimasu and imasu.
Particles – ni (location) and ga. Donata and dare.
Numbers (up to 99,999)
Kanji – numbers (1-10, 100, 1000, 10,000 and yen)
Family relationships and colours.
Conversation – audio

Festivals of Japan

UNIT III **(5 hours)**

Hiragana Charts 2&3, double consonants, vowel elongation and related vocabulary

Lesson 3

Grammar - particles ni (time), kara, made and ne. Koko, soko, asoko and doko.

Time expressions (today, tomorrow, yesterday, day before, day after)

Kanji – person, man, woman, child, tree and book

Directions – north, south, east and west

UNIT IV **(5 hours)**

Grammar - directions,-kochira, sochira, achira and dochira. Associated vocabulary (mae, ushiro, ue, shita, tonari, soba, etc.)

Conversation – audio

Japanese art and culture like ikebana, origami, etc.

UNIT V **(4 hours)**

Kanji – hidari, migi, kuchi

Japanese sports and martial arts

REFERENCES

1. First lessons in Japanese, ALC Japan
2. Japanese for dummies. Wiley publishing co. Inc., USA.
3. Kana workbook, Japan foundation

<table>
<tr><th colspan="13">LE1005 JAPANESE LANGUAGE PHASE I</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="11">Department of English and Foreign Languages</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student outcome</td><td>a</td><td>B</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td></tr>
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<tr><td>2</td><td>Mapping of instructional objectives with student outcome</td><td></td><td></td><td></td><td></td><td></td><td></td><td>1 to 4</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Category</td><td colspan="3">General (G)</td><td colspan="3">Basic Sciences (B)</td><td colspan="3">Engineering Sciences and Technical Arts (E)</td><td colspan="3">Professional Subjects (P)</td></tr>
<tr><td colspan="3">X</td><td colspan="3"></td><td colspan="3"></td><td colspan="3"></td></tr>
<tr><td>4</td><td>Approval</td><td colspan="11">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
LE1006	**KOREAN LANGUAGE PHASE I**	**2**	**0**	**0**	**2**
	Total contact hours-30				
	Prerequisite				
	Nil				

PURPOSE	
To enable students achieve a basic exposure on Korea, Korean language and culture. To acquire basic conversational skill in the language.	
INSTRUCTIONAL OBJECTIVES	
1.	To help students learn the scripts.
2.	To make the students acquire basic conversational skill.
3	To enable students to know about Korean culture.
4.	To create an advantageous situation for the students to have better opportunity for employability by companies who have association with Korea.

UNIT I **(6 hours)**

Lesson 1 < Introduction to Korean Language >, Lesson2 < Consonants and Vowels >, <Basic Conversation, Vocabularies and Listening >

UNIT II **(10 hours)**

Lesson 3 < Usage of "To be" >, Lesson 4 < Informal form of "to be" >, Lesson 5 <Informal interrogative form of "to be" >, Lesson 6 < To be, to have, to stay >, < Basic Conversation, Vocabularies and Listening >

UNIT III **(10 hours)**

Lesson 7 < Interrogative practice and Negation >, < Basic Conversation, Vocabularies and Listening >

UNIT IV **(4 hours)**

Lesson 8 < Korean Culture and Business Etiquette >, < Basic Conversation, Vocabularies and Listening

REFERENCES

1. Korean Through English 1 (Basic Korean Grammar and Conversation)
2. Bharati Korean (Intermediate Korean Grammar)
3. Hand-outs
4. Various visual mediums such Movie CD, Audio CD
5. Collection of vocabularies for engineering field.

LE1006 KOREAN LANGUAGE PHASE I												
Course designed by		**Department of English and Foreign Languages**										
1	Student outcome	a	B	c	d	e	F	g	h	i	j	k
								x				
2	Mapping of instructional objectives with student outcome							**1 to 4**				
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)				Professional Subjects (P)	
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
LE1007	**CHINESE LANGUAGE PHASE I**	**2**	**0**	**0**	**2**
	Total contact hours- 30				
	Prerequisite				
	NIL				

PURPOSE

To enable students achieve a basic exposure on China, Chinese language and culture. To acquire basic conversational skill in the language.

INSTRUCTIONAL OBJECTIVES

1.	To help students learn the Chinese scripts.
2.	To make the students acquire basic conversational skill.
3	To enable students to know about China and Chinese culture.
4.	To create an advantageous situation for the students to have better opportunity for employability by companies who have association with china.

UNIT I **(6 hours)**

Introduction of Chinese Language

UNIT II **(6 hours)**

Phonetics and Notes on pronunciation

a) 21 Initials:

b p m f d t n l g k h j q x z c s zh ch sh r

b) 37 Finals:

a	o	e	i	u	ü
ai	ou	ei	ia	ua	üe
an	ong	en	ian	uai	üan
ang		eng	iang	uan	ün
ao		er	iao	uang	
			ie	uei(ui)	
			in	uen(un)	
			ing	ueng	
			iong	uo	
			iou(iu)		

c) The combination of Initials and Finals - Pinyin

UNIT III **(6 hours)**

Introduction of Syllables and tones

a) syllable=initial+final+tone

b) There are four tones in Chinese: the high-and-level tone, the rising tone , the falling-and-rising tone, and the falling tone. And the markers of the different tones.

UNIT IV **(6 hours)**

A. Tones practice

B. the Strokes of Characters

1. Introduction of Chinese Characters
2. The eight basic strokes of characters

UNIT V **(6 hours)**

1. Learn to read and write the Characters:

八(eight) 不(not) 马(horse) 米(rice) 木(wood)

2. **classes are organized according to several Mini-dialogues**

REFERENCES

1. A New Chinese Course 1- Beijing Language and Culture University Press
2. New Practical Chinese Reader Textbook (1) – Beijing Language and Culture University Press
3. 40 Lessons For Basic Chinese Course I – Shanghai Translation Press
4. My Chinese Classroom - East China Normal University Press

LE1007 CHINESE LANGUAGE PHASE I												
Course designed by		Department of English and Foreign Languages										
1	Student outcome	a	B	c	d	e	F	g	h	i	j	k

								x					
2	Mapping of instructional objectives with student outcome							**1 to 4**					
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)			
		X											
4	Approval	23rd meeting of Academic Council, May 2013											

		L	**T**	**P**	**C**
PD1003	**APTITUDE I**	**1**	**0**	**1**	**1**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				
PURPOSE					
To enhance holistic development of students and improve their employability skills.					
INSTRUCTIONAL OBJECTIVES					
1.	To improve aptitude, problem solving skills and reasoning ability of the student.				
2.	To collectively solve problems in teams & group.				

UNIT I –NUMBERS **(6 hours)**

Types and Properties of Numbers, LCM, GCD, Fractions and decimals, Surds

UNIT II -ARITHMETIC – I **(6 hours)**

Percentages, Profit & Loss, Simple Interest & Compound Interest, , Clocks & calendars

UNIT III-ALGEBRA – I **(6 hours)**

Logarithms, Problems on ages

UNIT IV-MODERN MATHEMATICS – I **(6 hours)**

Permutations, Combinations, Probability

UNIT V-REASONING **(6 hours)**

Logical Reasoning, Analytical Reasoning

ASSESSMENT

1. Objective type – Paper based / Online – Time based test

REFERENCES

1. Agarwal.R.S – *Quantitative Aptitude for Competitive Examinations,* S.Chand Limited 2011
2. Abhijit Guha, *Quantitative Aptitude for Competitive Examinations,* Tata McGraw Hill, 3rd Edition, 2011
3. Edgar Thrope, *Test Of Reasoning for Competitive Examinations,* Tata McGraw Hill, 4th Edition, 2012

Other material related to quantitative aptitude

PD1003 APTITUDE I												
Course designed by		**Career Development Centre**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X			X							
2	Mapping of instructional objectives with student outcome	1			2							
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
MA1023	**DISCRETE MATHEMATICS**	**4**	**0**	**0**	**4**
	Total contact hours - 60 hours				
	(Common to IT)				
Purpose:					
The purpose of this course is to impart concepts of Discrete Mathematical					

Structures.	
Instructional objectives:	
1	To understand logic and mathematical reasoning to count or enumerate objects in systematic way.
2	To understand set theory, relations and functions to read , understand and construct mathematical arguments.
3	To understand recurrence relation, generating functions and algebraic systems and their applications in coding theory.
4	To understand how to apply graph theory to solve real world problems like travelling salesmen problem and networks, the maximal flow problem.
5	To understand grammers, finite state machine and turing machines.

UNIT I-MATHEMATICAL LOGIC (12 hours)

Proposition – Connectives – Truth Tables – Conditional and bi conditional propositions – Tautology and contradiction – Duality Law – Algebra and laws of Algebra of propositions – Tautological Implication Theory of Inference – Rules of Inference – Inconsistency – Indirect method of proof.

UNIT II-COMBINATORICS (12 hours)

Pigeonhole Principle – Generalized Pigeon hole principle – Mathematical induction – Recurrence relation – Formation of Recurrence Relation – Homogeneous Recurrence Relation – Non Homogeneous Recurrence Relation – Generating Functions

UNIT III-GROUP THEORY AND CODING THEORY (12 hours)

Group – Subgroups – Cyclic groups – Properties - Group Homomorphism – Cosets – Lagrange's Theorem - Encoders and Decoders – Group code – Hamming codes – Error correction - Decoding Group codes.

UNIT IV-GRAPH THEORY (12 hours)

Basic Definitions – Some Special simple Graphs – Matrix Representation of Graphs - Warshall's Algorithm – Paths - Eulerian and Hamiltonian Graphs – Shortest path Algorithms – Trees – Spanning Trees –Minimum Spanning Tree - Krushkal's Algorithm.

UNIT V-FORMAL LANGUAGES AND AUTOMATA THEORY (12 hours)

Phase structure Grammar – Types – Backus-Naur Form-Finite state machine-Input and output string for FSM-Finite state Automata – Definition-Language

Accepted by FSA- Deterministic and Non deterministic FSA – Language Accepted NFA- Conversion of an NFA to an equivalent DFA.

REFERENCES

1. Veerajan T., Discrete Mathematics with Graph Theory and Combinatorics", 10th edition,Tata McGraw Hill Companies,2010.
2. J.P. Tremblay, R.Manohar, "Discrete Mathematical Structures with applications to Computer Science" Tata McGraw-Hill Publishing company pvt.Ltd.,New Delhi,35th edition,2008.
3. Dr.M.K.Venkataraman, Dr.N.Sridharan N.Chandrasekaran, "Discrete Mathematics ", The National Publishing company,2003.
4. Kenneth H.Rosen, "Discrete Mathematics and its Application", Fifth edition, Tata McGraw-Hill Publishing company pvt.Ltd., New Delhi,2003.
5. Narsing Deo, "Graph Theory with applications to Engineering and Computer science", Prentice-Hall of India pvt. Ltd.,New Delhi, 2004.
6. Bernard Kolman, Robert C. Busby, Sharon Culter Ross, Nadeen-ur-Rehman "Discrete Mathematical Structures ", Pearson Education,5th edition,2004..

MA1023 DISCRETE MATHEMATICS												
Course designed by		**Department of Mathematics**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X				X						
2	Mapping of instructional objectives with student outcome	1-5				1-5						
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
				X								
4	Broad Area	Structural Engineering		Geotechnical Engineering		Water Resources Engineering		Geomatics Engineering				

5	Approval	23rd meeting of academic council, May 2013

		L	T	P	C
IT1004	**DESIGN AND ANALYSIS OF ALGORITHMS**	**3**	**0**	**0**	**3**
	Total contact hours -45				
	Prerequisite				
	Nil				

PURPOSE

The key to the practice of computing lies with applications. Effective application design requires the knowledge of design and analysis of algorithms, which aids in the development of applications. So, this course necessitates the need for acquiring basic concepts, mathematical aspects and analysis of algorithms.

INSTRUCTIONAL OBJECTIVES

1.	To understand basic concepts of algorithms.
2.	To analyze the mathematical aspects of algorithms.
3.	To understand and analyze sorting and searching algorithms.
4.	To apply algorithm design techniques.

UNIT I-BASIC CONCEPTS OF ALGORITHMS (9 hours)

Introduction - fundamentals of algorithm – algorithm design technique – designing an algorithm and data structure – methods of specifying an algorithm – analyzing algorithm – worst case, best case and average case analysis.

UNIT II-MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS (9 hours)

Mathematical analysis - asymptotic notations – Big O, Big Theta, Big Omega – comparing orders of growth - non-recursive algorithm - mathematical analysis of recursive algorithm.

UNIT III-DIVIDE AND CONQUER (11 hours)

Divide and conquer - Merge Sort – Quick sort – Binary search – Binary search tree traversal - Strassen's matrix multiplication - Algorithms for the Closest-Pair and Convex-Hull Problems.

UNIT IV-GREEDY METHOD AND DYNAMIC PROGRAMMING (9 hours)

Huffman Coding - Binomial Coefficients – Warshall's and Floyd's Algorithms - Knapsack Problem and Memory Functions.

UNIT V-BACKTRACKING (7 hours)

Backtracking - 8-Queen's Problem - Hamiltonian Circuit problem - Subset-Sum problem - Travelling salesman problem.

TEXT BOOK

1. AnanyLevitin, *'Introduction to the Design and Analysis of Algorithm'*, Pearson Education Asia, 2003.

REFERENCES

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, *'Introduction to Algorithms'*, PHI Pvt. Ltd., 2001.
2. A.V.Aho, J.E. Hopcroft and J.D.Ullman, '*The Design and Analysis Of Computer Algorithms'*, Pearson Education Asia, 2003.
3. Ellis Horowitz, SartajSahni and SanguthevarRajasekaran, '*Computer Algorithms/ C++'*, Second Edition, Universities Press, 2007.

IT1004 DESIGN AND ANALYSIS OF ALGORITHMS															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
		X	X	X											
2	Mapping of instructional objectives with student outcome	2	1 3	4											
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				

4	Broad area (for 'P'category)	Programming	Networking	Database	Web System	Human Computer Interaction	Platform Technologies
		X					
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1005	**COMPUTER ORGANIZATION AND ARCHITECTURE**	**3**	**0**	**2**	**4**
	Total contact hours – 75				
	Prerequisite				
	Knowledge of basics of Electronic engineering is preferred				

PURPOSE

Better understanding of interaction between hardware and software within a computer is required for any computing professional. This course intends to offer a framework for understanding the relationship between hardware and software by focusing on the concepts that are fundamental in building a basic computer.

INSTRUCTIONAL OBJECTIVES

1	Understand digital computers and their fundamental architecture.
2	Understand functionalities and organization of processor units and their types.
3	Gain knowledge on fundamentals of openCL programming

UNIT I-DIGITAL DATA REPRESENTATION (9 hours)

Introduction to Number Systems- Number Base Conversions –Signed number representation, fixed and floating point representations, character representation. Computer arithmetic - integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication - shift-and-add, Booth multiplier, carry save multiplier, etc. Division - non-restoring and restoring techniques, floating point arithmetic.

UNIT II-LOGICAL AND COMBINATIONAL CIRCUITS (9 hours)

Logical operations using gates- logic expression minimization – Combinational circuits and flip-flops- Classifications of semiconductor memories and memory organization

UNIT III-FUNCTIONAL BLOCKS OF A COMPUTER (9 hours)

CPU, Memory, Input-Output subsystems, Control unit. Instruction set architecture of a CPU - registers, Instruction execution cycle, RTL interpretation of instructions, Addressing modes, Instruction set, Hardwired and micro-programmed design approaches.

Case study – 1. Design of a simple hypothetical CPU
2. Instruction sets of some common CPUs

UNIT IV-PERIPHERAL DEVICES AND THEIR CHARACTERISTICS (9 hours)

Input-output Subsystems, I/O Transfers - program controlled, interrupt driven and DMA, Privileged and Non-privileged instructions, Software Interrupts and Exceptions. Programs and Processes - Role of interrupts in process state transitions.

UNIT V-PERFORMANCE ENHANCEMENT TECHNIQUES (9 hours)

Basic concepts of pipelining, throughput and speedup, Pipeline hazards- Memory interleaving, concept of hierarchical memory organization, Cache memory, cache size vs. block size, mapping functions, replacement algorithms, write policy.

LIST OF EXPERIMENTS (30 hours)

1. Implementation of basic gates, Half and Full adder
2. Implementation of MUX, DEMUX, Flip Flops
3. Coding and implementation of Arithmetic operations using algorithms
4. Familiarizationwith assembly language programming.
5. Introduction to OpenCL SDK Kit.
6. Hello world program with OpenCL.
7. Matrix Multiplication program with OpenCL.
8. Multiplication of array program with Open CL.
9. Selection sorting program with Open CL.

TEXT BOOKS

1. John P. Hayes, "*Computer Architecture and Organization"*, McGraw Hill.
2. Vincent P. Heuring and Harry F. Jordan, "*Computer Systems Design and Architecture*", Pearson Education.

REFERENCES

1. David A. Patterson and John L. Hennessy, "*Computer Organization and Design: The Hardware/Software Interface",* Elsevier.

2. Carl Hamachar, ZvoncoVranesic and SafwatZaky, "*Computer Organization*", McGraw Hill.
3. Benedict R. Gaster, Lee Howe's,"*Heterogeneous computing with Open CL"*.
4. William Stallings, "*Computer Organization and Architecture: Designing for Performance*", Pearson Education.

IT1005 COMPUTER ORGANIZATION AND ARCHITECTURE															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
		X		X						X					
2	Mapping of instructional objectives with student outcome	1		2						3					
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming			Networking			Database			Web System		Human Computer Interaction		Platform Technologies
															X
5	Approval	23rd meeting of Academic Council, May 2013													

		L	**T**	**P**	**C**
IT1006	**OBJECT ORIENTED ANALYSIS AND DESIGN**	**2**	**0**	**2**	**3**
	Total contact hours -60				
	Prerequisite				
	Nil				
PURPOSE					
This course separates and makes explicit, the decisions that make up an					

object oriented analysis and design. We show how to use the UML notations most effectively both to discuss designs with colleagues and in documents.	
INSTRUCTIONAL OBJECTIVES	
1.	Gaining enough competence in object-oriented analysis and design (OOAD) to tackle a complete object oriented project
2.	Using UML- a common language for talking about requirements- designs- and component interfaces
3.	Using different approaches for identifying classes- design process and different design patterns for developing projects
4.	Developing testing strategies to ensure Software Quality, measure user satisfaction and usability of the developed system

UNIT I-INTRODUCTION (6 hours)

Introduction - Development process. OMT- Booch methodology- Jacobson methodology - Unified Approach

UNIT II-UML DIAGRAMS (6 hours)

Use Cases – Class Diagrams: Essentials & Advanced Concepts. Sequence Diagrams – Package Diagrams- Deployment Diagrams – State Machine Diagram – Activity Diagram – Communication & Component Diagrams

UNIT III-DESIGN (6 hours)

Design Process & Design Axioms: OO Design Axioms – Corollaries- **Designing Classes:** Class

Design – Designing method protocol- **Access Layer:** Object Storage and object interoperability - **View Layer.** Case study

UNIT IV-DESIGN PATTERNS (6 hours)

Introduction – Abstraction-Occurrence Pattern – General Hierarchy Pattern – Player- Role Pattern – Singleton pattern - Observer Pattern – Delegation Pattern – Adapter Pattern – Facade Pattern – Immutable Pattern – Read-Only Interface Pattern – Proxy Pattern

UNIT V-SOFTWARE QUALITY AND USABILITY (6 hours)

Measuring User Satisfaction & System Usability - Software Quality Assurance

LIST OF EXPERIMENTS (30 hours)

1. Develop an SRS document. Also develop risk management and project plan (Gantt chart).
2. Identify Use Cases and develop the Use Case model.
3. Identify the business activities and develop an UML Activity diagram.

4. Identity the conceptual classes and develop a domain model with UML Class diagram.
5. using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
6. Draw the State Chart diagram.
7. Identify the User Interface, Domain objects, and Technical services. Draw thepartial layered, logical architecture diagram with UML package diagram notation.
8. Implement the Technical services layer.
9. Implement the Domain objects layer.
10. Implement the User Interface layer.
11. Draw Component and Deployment diagrams.

TEXT BOOK

1. Timothy C. Lethbridge & Robert Laganiere "*Object Oriented System Development*", McGraw Hill International Edition- 2008

REFERENCES

1. Martin Fowler "*UML Distilled – A brief guide to the standard Object Modeling language*", 3rd Edition, Pearson Education, Inc. 2009.
2. Timothy C. Lethbridge & Robert Laganiere "*Object Oriented Software Engineering*", Tata MCGraw- Hill, Reprint 2011.

IT1006 OBJECT ORIENTED ANALYSIS AND DESIGN															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
			X	X							X				
2	Mapping of instructional objectives with student outcome		2	3							14				
3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)				Professional Subjects (P)							
								X							

4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
		X					
5	Approval	23rd meeting of Academic Council, May 2013					

SEMESTER IV

		L	T	P	C
LE1008	**GERMAN LANGUAGE PHASE II**	**2**	**0**	**0**	**2**
	Total contact hours- 30				
	Prerequisite				
	The student should have studied German phase I				

PURPOSE

Familiarity in German language will be helpful for the students in preparing their resumes in German. Proficiency in the language will be an added asset for the students to have an edge in the present day highly competitive and global job market.

INSTRUCTIONAL OBJECTIVES

1.	To enable the students to speak and understand about most of the activities in the day to day life.
2.	The students will be able to narrate their experiences in Past Tense.
3.	The students will be able to understand and communicate even with German Nationals.
4.	By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT I **(6 hours)**

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verben mit trennbaren Vorsilben im Präsens und Perfekt. Verben mit trennbaren Vorsilben und Modalverben imPräsens. Verben mit untrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT II **(6 hours)**

Wichtige Sprachhandlungen: Kleidung ,Farben , Materialien.

Grammatik : formelle Imperativsätze mit “Sie” informelle Imperativsätze Vorschläge mit “wir” – “sollen/wollen wir”—Soll ich? Modalpartikeln “doch” “mal” “doch mal.

UNIT III **(6 hours)**

Wichtige Sprachhandlungen : Sehenswürdigkeite (Prater, Brandenburger Tör,Kolossium, Eifeltürm)
Grammatik : Ortsangaben mit Akk. und Dativ “alle”,”man”
Indefinitepronomen “etwas”, “nichts”,

UNIT IV **(6 hours)**

Wichtige Sprachhandlungen : Wegbeschreibung/ Einladung interkulturelle Erfahrung.
Grammatik : Verwendung von Präsens für zukünftigen Zeitpunkt.

UNIT V **(6 hours)**

Wichtige Sprachhandlungen: Essen und Trinken im Restaurant , Partyvorbereitung und Feier
Grammatik: Nomen aus Adjektiven nach “etwas”und “nichts” Nomen aus dem Infinitiv von Verben, zusammegesetzte Nomen und ihre Artikel. Adjektive im Nom. und Akk. nach unbestimmten Artikel, Negativartikel und Possessivartikel.

REFERENCE

1.Studio d A1.Deutsch als Fremdsprache with CD.(Kursbuch und Sprachtraining)

LE01008 GERMAN LANGUAGE PHASE II												
Course designed by		**Department of English and Foreign Languages**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
								x				
2	Mapping of instructional objectives with student outcome							**1to4**				
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		

		X			
4	Approval	23rd meeting of Academic Council, May 2013			

		L	**T**	**P**	**C**
LE1009	**FRENCH LANGUAGE PHASE II**	**2**	**0**	**0**	**2**
	Total contact hours- 30				
	Prerequisite				
	The student should have studied phase I of French				

PURPOSE

To enable the students communicate effectively with any French speaker and have a competitive edge in the international market.

INSTRUCTIONAL OBJECTIVES

1.	To enable students access information on the internet
2.	To receive and send e mails
3.	To assist students in gaining a certain level of proficiency to enable them to give the level 1 exam conducted by Alliance Française de Madras.
4.	To enhance their lexical and technical competence.

UNIT I **(6 hours)**

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir . "Les preposition de temps": à, en, le, de 7h à 8h, jusqu' à, vers.
Listening and Speaking – the semi- vowels: Voilà, pollutant.
Writing –the days of the week. Months, technical subjects, time, "les spécialités scientifiques et l' année universitaire, paragraph writing about time table.
Reading -- Reading of the text and comprehension – answering questions .

UNIT II **(6 hours)**

Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms "les métiers scientifiques".
Listening and Speaking – Vowels: soirée, année, près de, très.
Writing – Countries name, nationality, "les métiers scientifiques", numbers from: 69 to infitive and some measures of unit.
Reading Comprehension – reading a text.

UNIT III **(6 hours)**

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb,

Listening and Speaking –"La liaison interdite – en haut".

Writing – some scientific terms, French expressions to accept an invitation. Sentence framing.

Reading Comprehension – reading a text.

UNIT IV **(6 hours)**

Grammar and Vocabulary –the verbs: manger, boire , the partitive articles

Listening and Speaking – "le 'e' caduc

Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits.

Reading – reading a text.

UNIT V **(6 hours)**

Grammar and Vocabulary – " les prepositions de lieu": au à la, à l', chez, the reflexives verbs, verbs to nouns.

Listening and Speaking – "le 'e' sans accents ne se prononce pas. C'est un "e" caduc. Ex: quatre, octobre. " les sons (s) et (z)- salut , besoin.

Writing –paragraph writing about one's everyday life, French culture.

Reading Comprehension -- reading a text or a song.....

REFERENCES

1. French for Dummies.
2. French made easy: Goyal publishers

LE1009 FRENCH LANGUAGE PHASE II												
Course designed by		**Department of English and Foreign Languages**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
								x				
2	Mapping of instructional objectives with student outcome							1to 4				
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)			
		X										

4	Approval	23rd meeting of Academic Council, May 2013

		L	T	P	C
LE1010	**JAPANESE LANGUAGE PHASE II**	**2**	**0**	**0**	**2**
	Total contact hours- 30				
	Prerequisite				
	The student should have studied Japanese I				

PURPOSE

To enable students to learn a little advanced grammar in order to improve their conversational ability in Japanese.

INSTRUCTIONAL OBJECTIVES

1.	To help students learn Katakana script (used to write foreign words)
2.	To improve their conversational skill.
3.	To enable students to know about Japan and Japanese culture.
4.	To improve their employability by companies who are associated with Japan.

UNIT I **(8 hours)**

Introduction to Verbs; Ikimasu, okimasu, nemasu, tabemasu etc.
Grammar – usage of particles de, o, to, ga(but) and exercises
Common daily expressions and profession.
Katakana script and related vocabulary.
Religious beliefs, Japanese housing and living style.
Conversation – audio

UNIT II **(8 hours)**

Grammar :Verbs –Past tense, negative - ~mashita, ~masen deshita..
i-ending and na-ending adjectives - introduction
Food and transport (vocabulary)
Japanese food, transport and Japanese tea ceremony.
Kanji Seven elements of nature (Days of the week)
Conversation – audio

UNIT III **(6 hours)**

Grammar - ~masen ka, mashou
Adjectives (present/past – affirmative and negative)
Conversation – audio

UNIT IV **(4 hours)**

Grammar – ~te form
Kanji – 4 directions
Parts of the body
Japanese political system and economy
Conversation – audio

UNIT V **(4 hours)**

Stationery, fruits and vegetables
Counters – general, people, floor and pairs

REFERENCES

1. First lessons in Japanese, ALC Japan
2. Japanese for dummies.Wiley publishing co.Inc.,USA.
3. Kana workbook, Japan foundation

LE1010 JAPANESE LANGUAGE PHASE II												
Course designed by		**Department of English and Foreign Languages**										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
								x				
2	Mapping of instructional objectives with student outcome							**1 to 4**				
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)	
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	**T**	**P**	**C**
LE1011	**KOREAN LANGUAGE PHASE II**	**2**	**0**	**0**	**2**
	Total contact hours-30				
	Prerequisite				
	The student should have studied Korean- I				
PURPOSE					
To enable students achieve a basic exposure on Korea, Korean language and					

culture. To acquire basic conversational skill in the language.	
INSTRUCTIONAL OBJECTIVES	
1.	To help students learn the scripts.
2.	To make the students acquire basic conversational skill.
3	To enable students to know about Korean culture.
4.	To create an advantageous situation for the students to have better opportunity for employability by companies who have association with Korea.

UNIT I (**9 hours)**

Lesson 1 <Review of Vowels and Consonants>, Lesson2 < Various Usages of "To be">, Lesson3 < Informal form of "to be"> <Basic Conversation, Vocabularies and Listening>

UNIT II (**9 hours)**

Lesson 4 < Informal interrogative form of "to be">, Lesson 5 < To be, to have, to stay>, Lesson 5 < Advanced Interrogative practice>, Lesson 6 < Types of Negation>, <Basic Conversation, Vocabularies and Listening>

UNIT III (**9 hours)**

Lesson 7 < Honorific forms of noun and verb2>, Lesson8 < Formal Declarative2>, Lesson 9 < Korean Business Etiquette>, <Basic Conversation, Vocabularies and Listening>

UNIT IV (**3 hours)**

Lesson 10 <Field Korean as an Engineer1>, <Field Korean as an Engineer2> , <Basic Conversation, Vocabularies and Listening>

REFERENCES

1. Korean through English 2 (Basic Korean Grammar and Conversation)
2. Bharati Korean (Intermediate Korean Grammar)
3. Hand-outs
4. Various visual mediums such Movie CD, Audio CD, and music
5. Collection of vocabularies for engineering field.

LE1011 KOREAN LANGUAGE PHASE II												
Course designed by		Department of English and Foreign Languages										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
								x				
2	Mapping of instructional objectives with student outcome							**1 to 4**				
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
LE1012	**CHINESE LANGUAGE PHASE II**	**2**	**0**	**0**	**2**
	Total contact hours-30				
	Prerequisite				
	The student should have studied Chinese I				

PURPOSE

To enable students achieve a basic exposure on China, Chinese language and culture. To acquire basic conversational skill in the language.

INSTRUCTIONAL OBJECTIVES

1.	To help students learn the Chinese scripts.
2.	To make the students acquire basic conversational skill.
3	To enable students to know about China and Chinese culture.
4.	To create an advantageous situation for the students to have better opportunity for employability by companies who have association with china.

UNIT I **(6 hours)**

A) Greetings
Questions and answers about names
Introducing oneself
Receiving a guest
Making corrections

New words: 你（you） 好（good, well）
作（work, job）人员（personnel, staff member） 请问（May I ask…） 贵（expensive , valuable）
姓（one's family name is ）

B) Questions and answers about the number of people in a family
Expressing affirmation/negation
Questions and answers about the identity of a person same or not.

New words: 家（family, home） 有（have） 几（several）
爸爸 (father） 妈妈 (mother) 哥哥 (elderly brother）

UNIT II **(6 hours)**

A. About places
B. About numbers
C. if one knows a certain person
D. Expressing apology
E. Expressing affirmation/negation
F. Expressing thanks.

New Words:
客人（guest,visitor）这儿（here）中文（Chinese） 对（right, correct）
学生（student） 多（many, a lot）
Grammar: Sentences with a verbal predicate

UNIT III **(6 hours)**

Introducing people to each other
A. Exchanging amenities
B. Making/Negating conjectures
C. Questions and answers about nationality
Grammar: Sentences with an adjectival predicate

UNIT IV **(6 hours)**

A) About places to go
Indicating where to go and what to do
Referring to hearsay.
Saying good-bye

B) Making a request
Questions and answers about postcodes and telephone numbers
Reading dates postcodes and telephone numbers
Counting Renmibi

Grammar: Sentences with a subject-verb construction as its predicate
Sentences with a nominal predicate

UNIT **(6 hours)**

B. Asking and answering if someone is free at a particular time
C. Making proposals
D. Questions about answers about time
E. Making an appointment
F. Telling the time
G. Making estimations

REFERENCES

1. A New Chinese Course 1- Beijing Language and Culture University Press
2. New Practical Chinese Reader Textbook (1) – Beijing Language and Culture University Press
3. 40 Lessons For Basic Chinese Course I – Shanghai Translation Press
4. My Chinese Classroom - East China Normal University Press

LE1012 CHINESE LANGUAGE PHASE II												
Course designed by		**Department of English and Foreign Languages**										
1	Student outcome	a	B	c	d	e	F	g	h	i	j	k
								x				
2	Mapping of instructional objectives with student outcome							**1 to 4**				
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	**T**	**P**	**C**
PD1004	**APTITUDE II**	**1**	**0**	**1**	**1**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				
PURPOSE					
To enhance holistic development of students and improve their employability skills.					
INSTRUCTIONAL OBJECTIVES					

1.	To improve verbal aptitude, vocabulary enhancement and reasoning ability of the student.

UNIT I **(6 hours)**
Critical Reasoning – Essay Writing

UNIT II **(6 hours)**
Synonyms – Antonyms - Odd Word - Idioms & Phrases

UNIT III **(6 hours)**
Word Analogy - Sentence Completion

UNIT IV **(6 hours)**
Spotting Errors - Error Correction - Sentence Correction

UNIT V **(6 hours)**
Sentence Anagram - Paragraph Anagram - Reading Comprehension

ASSESSMENT
1. Objective type – Paper based /Online – Time based test

REFERENCES

1. Personality Development -Verbal Work Book, Career Development Centre, SRM Publications
2. Gren Sharon Weiner M.A & Wolf Ira K.*Barron's New GRE*, *19th Edition*. Barron's Educational Series, Inc, 2011.
3. Lewis Norman, *Word Power Made Easy*, Published by W.R.Goyal Pub, 2011.
4. Thorpe Edgar and Thorpe Showich, *Objective English.* Pearson Education 2012.
5. Murphy Raymond, *Intermediate English Grammar*, (Second Edition), Cambridge University Press, 2012.

PD1004 APTITUDE II

Course designed by		Career Development Centre										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
								X				
2	Mapping of instructional objectives with student outcome							1				

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)	Professional Subjects (P)
		X			
4	Approval	23rd meeting of Academic Council, May 2013			

		L	T	P	C
MA1014	**PROBABILITY AND QUEUEING THEORY**	**4**	**0**	**0**	**4**
	Total contact hours - 60 hours				
	(Common to CSE, SWE & IT)				

PURPOSE

To impart statistical techniques using probability and distributions.

INSTRUCTIONAL OBJECTIVES

1	Be thorough with statistical averages
2	To acquire knowledge on probability distributions.
3	Get exposed to the testing of hypothesis using distributions.
4	Gain knowledge in principles of queuing theory.
5	Get exposed to discrete time Markov chain

UNIT I-RANDOM VARIABLES AND STATISTICAL AVERAGES (12 hours)

Random Variable – Characteristics of a random variable: Expectation, Variance,Moments; Moment generating function – Function of a random variable – Chebychev's inequality

UNIT II-THEORETICAL DISTRIBUTIONS (12 hours)

Discrete : Binomial, Poisson, Geometric; Continuous : Exponential ,Normal and Uniform Distributions.

UNIT III-TESTING OF HYPOTHESES (12 hours)

Large sample tests based on Normal Distribution – Small sample tests based on t, F distributions – Chi square tests for goodness of fit and independence of attributes.

UNIT IV-PRINCIPLES OF QUEUEING THEORY (12 hours)

Introduction to Markovian queueing models – Single server model with finite and infinite system capacity – Characteristics of the model; Applications of queueing theory to computer science and engineering.

UNIT V-MARKOV CHAINS (12 hours)

Introduction to Markov process – Markov chains – transition probabilities – Limiting distribution – Classification of states of a Markov chain.

REFERENCES

1. Veerarajan T., Probability, "*Statistics and Random Processes*", Tata McGraw Hill,3rd edition, 2008.
2. Moorthy.M.B.K,Subramani.K & Santha.A, "*Probability and queueing theory"*,Scitech publications,Vth edition,2013.
3. S.C. Gupta and V.K. Kapoor, *"Fundamentals of Mathematical Statistics"*, 11th extensively revised edition, Sultan Chand & Sons, 2007.
4. Trivedi K S, " *Probability and Statistics with reliability, Queueing and Computer Science Applications*",Prentice Hall of India,New Delhi,2nd revised edition, 2002.
5. Gross.D and Harris.C.M. "*Fundementals of Queuing theory*", John Wiley and Sons, 3rd edition , 1998.
6. Allen.A.O., "*Probability Statistics and Queuing theory with computer science applications*",Academic Press, 2nd edition,1990.

MA1014 PROBABILITY AND QUEUEING THEORY	
Course designed	**Department of Mathematics**

	by											
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X				X						
2	Mapping of instructional objectives with student outcome	1-5				1-5						
3	Category	General (G)			Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
					X							
4	Broad Area	Structural Engineering			Geotechnical Engineering		Water Resources Engineering			Geomatics Engineering		
5	Approval	23rd meeting of academic council, May 2013										

		L	T	P	C
IT1007	**PRINCIPLES OF COMMUNICATION SYSTEMS**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

The purpose of this course is to introduce the basic concepts of traditional analog and digital electronic communication systems and to impart knowledge on the importance of secret multi user radio communication and effective usage of channel bandwidth.

INSTRUCTIONAL OBJECTIVES

1.	Understand analog and digital communication techniques
2.	Gain knowledge on information capacity of a channel
3.	Understand basics of different cryptographic techniques

UNIT I-ANALOG COMMUNICATION (9 hours)

Noise: Source of Noise - External Noise- Internal Noise- Noise Calculation.

Introduction to Communication Systems: Modulation – Types - Need for Modulation. Theory of Amplitude Modulation - Evolution and Description of SSB Techniques - Theory of Frequency and Phase Modulation – Comparison of various Analog Communication System (AM – FM – PM).

UNIT II-DIGITAL COMMUNICATION (9 hours)

Amplitude Shift Keying (ASK) – Frequency Shift Keying (FSK) Minimum Shift Keying (MSK) –Phase Shift Keying (PSK) – BPSK – QPSK – 8 PSK – 16 PSK - Quadrature Amplitude Modulation (QAM) – 8 QAM – 16 QAM – Bandwidth Efficiency– Comparison of various Digital Communication System (ASK – FSK – PSK – QAM).

UNIT III-DATA AND PULSE COMMUNICATION (9 hours)

Data Communication: History of Data Communication - Standards Organizations for Data Communication- Data Communication Circuits - Data Communication Codes - Error Detection and Correction Techniques.

Pulse Communication: Pulse Amplitude Modulation (PAM) – Pulse Time Modulation (PTM) – Pulse code Modulation (PCM) - Comparison of various Pulse Communication System (PAM – PTM – PCM)

UNIT IV-INFORMATION THEORY & CRYPTOGRAPHY (9 hours)

Information Theory: Shannon Limit for Information Capacity – Uncertainty - Entropy- Source Coding - Huffman Coding - Mutual Information- Channel Capacity.

Cryptography: Fundamental concepts of Cryptosystems - Authentication, Digital Signature - Stream Cipher System – Private Key Distribution System -. Public Key Distribution System.

UNIT V-MULTI-USER RADIO COMMUNICATION (9 hours)

(Elementary Treatment Only)

Advanced Mobile Phone System (AMPS) - Global System for Mobile Communications (GSM) - Code division multiple access (CDMA) - Cellular Concept and Frequency Reuse - Channel Assignment and Hand off - Overview of Multiple Access Schemes - Satellite Communication - Bluetooth.

TEXT BOOKS

1. Wayne Tomasi, "*Electronic Communications Systems Fundamentals Through Advanced*", Pearson Education Asia, 5th Edition ,2009
2. Rappaport T.S, "*Wireless Communications: Principles and Practice*", 2nd edition, Pearson education

REFERENCES

1. Simon Haykins, "*Communication Systems"*, John Wiley and Sons, INC., 4th Edition, 2001
2. George Kennedy, "*Electronic Communication Systems*", Tata McGraw Hill Edition, 3rd Edition ,1991
3. John G. Prokias, "*Digital Communication*", McGraw Hill Inc, 2001
4. K. Sam Shanmugam, "*Digital & Analog Communication Systems"*, John Wiley & sons, 2nd Edition ,1994
5. Rodger E. Ziemer / William H. Tranter," *Principles of Communication*", , John Wiley & Sons, Inc, 5th Edition ,2002
6. Taub, Schilling, "*Principles of Communication Systems*", Tata McGraw-Hill Edition, second Edition, 1991

IT1007 PRINCIPLES OF COMMUNICATION SYSTEMS															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
										X					
2	Mapping of instructional objectives with student outcome									1 2 3					
3	Category	General (G)			Basic Sciences (B)				Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
									X						
4	Broad area (for 'P'category)	Programming			Networking			Data base	Web System		Human Computer Interaction			Platform Technologies	
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1008	**MICROPROCESSORS AND MICROCONTROLLERS**	**3**	**0**	**2**	**4**
	Total contact hours – 75				
	Prerequisite				
	Knowledge of Digital Electronics is preferred				

PURPOSE

Advancements in microprocessor technologies and microcontroller operations have been occurring in a steadfast manner. In order to keep pace with the rapid developments, an understanding of basic microprocessor and microcontroller architecture, assembly language programming, interfacing operations is required. Hence, this course facilitates the comprehensive coverage of afore mentioned topics.

INSTRUCTIONAL OBJECTIVES

1.	Become proficient in the functional and technological characteristics of microprocessor and microcontroller structures
2.	Understand and write assembly language programs
3.	Learn about memory components, peripheralsupport devices and their interface logic

UNIT I-INTEL 8085 ARCHITECTURE (9 hours)

Introduction to 8085: 8085 architecture- Instruction Set - Assembler Directives- Assembly Language-Programming with 8085.

UNIT II-8086 PROCESSOR ARCHITECTURE (9 hours)

Register Organisation – Architecture – Signals – Memory Organization – Bus Operation – I/O addressing-Addressing Modes – Instruction Set – Assembler Directives. Introduction to 8086 Assembly Language Programming. Stack Structure – Interrupts – Interrupt Service Routines – Interrupt Cycle – Interrupt Programming – Macros – Timings and Delays.

UNIT III-COMMUNICATION INTERFACES (9 hours)

Basic Peripherals & their interfacing with 8086/8088: Semiconductor Memory Interfacing-

Dynamic RAM Interfacing- Interfacing I/O Ports- PIO 8255; Modes of Operation.

UNIT IV-PERIPHERAL INTERFACES (9 hours)

Special Purpose Programmable Peripheral Devices & their Interfacing: Programmable

Interval Timer 8253- Programmable Interrupt Controller 8259A.**DMA Controller 8257:** DMA Transfers & Operations.

UNIT V-INTRODUCTION TO 8051 (9 hours)

Architecture, Signals, Register Set, Memory and I/O addressing, Timers, Interrupts, Serial Communication, Instruction Set, Basic programming using assembly and C.

TEXT BOOKS

1. Soumitra Kumar Mandal ,"*Microprocessors and Microcontrollers: Architecture, Programming and Interfacing using 8085, 8086 and 8051*", McGraw Hill.

REFERENCES

1. AK Ray, KM Bhurchandi, "*Advanced Micorprocessors and Peripherals*", McGraw Hill 2nd Edition.
2. Mazidi ,"*The 8051 Microcontroller and Embedded Systems using Assembly and C* ",2nd Edition
3. Ramesh S.Goankar, "*Microprocessor 8085"*, 5th Edition.

LIST OF EXPERIMENTS (30 hours)

PART-I: (8086 Experiments)

1. Basic arithmetic and Logical operations.
2. Sorting and searching algorithms.
3. RAM size and system date.
4. Digital clock.
5. Keyboard and printer status.
6. Password checking.
7. Serial interface and parallel interface.
8. Trouble shooting.

PART II: (8051 Experiments)

1. Basic arithmetic and Logical operations
2. Square and Cube program
3. Find 2's complement of a number
4. Unpacked BCD to ASCII

IT1008 MICROPROCESSORS AND MICROCONTROLLERS																
Course designed by		**Department of Information Technology**														
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n	
				X						X						
2	Mapping of instructional objectives with student outcome			3						1 2						
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)					
											X					
4	Broad area (for 'P' category)	Programming			Networking			Data base			Web System		Human Computer Interaction		Platform Technologies	
															X	
5	Approval	23rd meeting of Academic Council, May 2013														

		L	T	P	C
IT1009	**DATA STRUCTURES AND ALGORITHMS**	**2**	**0**	**2**	**3**
	Total contact hours – 60				
	Prerequisite				
	Knowledge in Program Design and Development, Design and Analysis of Algorithms is preferred.				

PURPOSE

As computers become faster, the need for programs that handle large amounts of data becomes more acute. In order to write efficient programs, the

understanding of elementary data structures and methods to analyze algorithms towards performance issues is necessary. So this course focuses on dealing with the basic data structures and related algorithms.	
INSTRUCTIONAL OBJECTIVES	
1.	Understand elementary data structures such as stacks, queues, linked lists, trees and graphs.
2.	Implement sorting, searching and hashing algorithms and analyze the algorithms.
3.	Assess how the choice of data structures and algorithm design methods impacts the performance of programs.

UNIT I-LINEAR DATA STRUCTURES (6 hours)

Introduction- Performance Analysis- **Linear Data Structures:** Lists – array representation, linked representation, Cursor implementation- stacks- Queues and their applications.

UNIT II-TREE DATA STRUCTURE (6 hours)

Basic concepts and terminology- **Binary trees:** implementation and tree traversal algorithms - Expression tree- Binary Search Trees.

UNIT III-BALANCED TREE DATA STRUCTURE (5 hours)

Balanced Search Trees – AVL Trees - Red Black Trees – Splay Trees – B-trees – Priority Queues (Heaps)

UNIT IV-SORTING AND HASHING (5 hours)

Sorting: Shell Sort- Heap Sort- Quick Sort – Bucket sort, Radix sort - **Hashing**: Hash Function- Open and Closed Hashing- rehashing- extendible hashing.

UNIT V-GRAPH ALGORITHMS (8 hours)

Definitions and representation of graphs- Undirected and Directed graphs- Shortest Path Algorithms-Network Flow Problems- Minimum Spanning Tree- Graph Search Methods: Breadth First-Depth First Search- Introduction to NP–Completeness.

LIST OF EXPERIMENTS (30 hours)

1. List ADT implementation using dynamic memory allocation
2. Implementation of Stack
3. Implementation of Queue
4. Applications of Stack – Infix to Postfix conversion with postfix evaluation
5. Applications of Queue – Scheduling
6. Implementation of Binary Search Tree
7. Implementation of Tree traversal Techniques

8. Implementation of Shell, Heap and Quick sort Techniques.
9. Implementation of Shortest path algorithms on Graph data structure
10. Implementation of Graph traversal Techniques.

TEXT BOOK

1. Mark Allen Weiss," *Data Structures and Problem Solving using C++",* The Benjamin Cummings/ Addison Wesley Publishing Company, 2002.

REFERENCES

1. SartajSahni, "*Data Strucutres, Algorithms and Applications in C++",* second edition, University Press,2005.
2. Alfred V. Aho, John E. Hopcoft, Jeffrey D. Ullman, "*Data Strucutures and Algorithms",* Addision Wesley, 1987
3. Thomas A. Standish, "*Data Structures, Algorithm and Software Principles in C",* Addison – Wesley Publishing Company,1st Edition,1995.
4. Horowitz Ellis, SahniSartaj, Mehta Dinesh, "*Fundamentals of Data Structures in C++*", 2nd Edition, 2000, Galgotia Publications.
5. Brassard Bratley , "*Fundamentals of Algorithms",* PHI , 1996.

IT1009 DATA STRUCTURES AND ALGORITHMS

Course designed by		**Department of Information Technology**														
1	Student outcome	a	b	c	d	E	f	G	h	i	j	k	l	m	n	
		X		X						X						
2	Mapping of instructional objectives with student outcome	1		2						3						

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)	Professional Subjects (P)
					X

4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
		X					
5	Approval	23rd meeting of Academic Council, May 2013					

COURSES WHICH CAN BE REGSTERED FOR EITHER IN III OR IV SEMESTER

		L	T	P	C
IT1010	**PROFESSIONAL ETHICS**	**2**	**0**	**0**	**2**
	Total contact hours – 30				
	Prerequisite				
	Nil				

PURPOSE

Today's engineers are surrounded with lot of social, moral and ethical issues. In order to make them proficient in skills related to resolving the aforementioned issues, this course will serve as a fundamental knowledge building base.

INSTRUCTIONAL OBJECTIVES

1.	Learn methodologies to resolve moral dilemmas
2.	Understand how to practice the role of engineers as responsible experimenters
3.	Understand the responsibility towards safety and the role of engineers as managers, consultants, expert witnesses, advisors.

UNIT I-ENGINEERING ETHICS (6 hours)

Senses of 'Engineering Ethics'-Variety of Moral Issues-Types of Inquiry-Moral Dilemmas-Moral Autonomy-Kohlberg's Theory-Gilligan's Theory-Consensus and Controversy-Professions and Professionalism-Professional Ideals and Virtues-Theories About Right Action- Self-Interest-Customs and Religion-Uses of Ethical Theories

UNIT II-ENGINEERING AS SOCIAL EXPERIMENTATION (6 hours)

Engineering as Experimentation-Engineers as Responsible Experimenters-Codes of Ethics-A
Balanced Outlook on Law-The Challenger Case Study

UNIT III-ENGINEER'S RESPONSIBILITY FOR SAFETY (6 hours)

Safety and Risk-Assessment of Safety and Risk-Risk Benefit Analysis-Reducing Risk-Case
Studies

UNIT IV-RESPONSIBILITIES AND RIGHTS (6 hours)

Collegiality and Loyalty-Respect for Authority-Collective Bargaining-Confidentiality-Conflicts of Interest-Occupational Crime-Professional Rights-Employee Rights-IPR-Discrimination

UNIT V-GLOBAL ISSUES (6 hours)

Multinational Corporations-Environmental Ethics-Computer Ethics-Weapons Development-
Engineers as Managers-Consulting Engineers-Engineers as Experts Witnesses and Advisors-
Moral Leadership-Sample Code of Conduct

TEXT BOOK

1. Mike Martin and Roland Schinzinger*,"Ethics in Engineering"*, McGraw Hill, New York 4th edition, 2005

REFERENCES

1. M.Govindarajan, S.Natarajan, V.S.SenthilKumar, "*Engineering Ethics"*, PHI, 2005
2. Charles D.Fleddermann, "*Engineering Ethics"*, Prentice Hall, New Mexico, 4th Edition 2011.

IT1010 PROFESSIONAL ETHICS															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
						X		X	X						
2	Mapping of instructional objectives with student outcome					1 2 3		3	1						
3	Category	General (G)				Basic Sciences (B)			Engineering Sciences and Technical Arts (E)				Professional Subjects (P)		
		X													
4	Broad area (for 'P'category)	Programming			Networking		Data base		Web System		Human Computer Interaction			Platform Technologies	
5	Approval	23rd meeting of Academic Council, May 2013													
											L	**T**	**P**	**C**	

IT1011	HUMAN COMPUTER INTERACTION	2	0	0	2
	Total contact hours – 30				
	Prerequisite				
	Nil				

PURPOSE	
The purpose of this course is to make the students knowledgeable in the area of designing, implementing and using interactive computer systems and how effective design of human computer interfaces influence individuals and organizations.	
INSTRUCTIONAL OBJECTIVES	
1.	Understand basic HCI concepts and definitions
2.	Understand the role of modeling
3.	Study the user-centered design- task analysis- GOMS- and other key HCI methods
4.	Perform rapid prototyping and evaluation

UNIT I-FOUNDATIONS (6 hours)

Human:Input-Output channels- Human memory- Thinking- Emotion- Individual difference- psychology. Computer: Text entry devices- display devices- 3D interaction- paper- memory- processing and networks. Interactions: Models- Frame work- Ergonomics- Interaction styles- WIMP- Interactivity- Context and experience.

UNIT II-DESIGN PROCESS (6 hours)

Interaction design basics:Navigation- Screen- Screen design- Iteration and prototyping.HCI in the software process: Software life cycle- Usability. Design rules: Support Usability- Standards- Guidelines- Golden rules- HCI pattern.

UNIT III-IMPLEMENTATION AND EVALUATION (6 hours)

Implementation support:Elements of Windowing- programming application-toolkits- UI management systems . Evaluation Technique: Goals-Expert analysis-user participation evaluation methods - Universal Design - User support

UNIT IV- MODELS AND TASK ANALYSIS (6 hours)

Cognitive models: Socio-organizational issues & stakeholder requirements – communication & collaboration models – Task analysis.

UNIT V - MODELS- THEORIES AND GROUPWARE (6 hours)

Dialog notations and design - Models of the system- Modeling rich interaction - Groupware.

TEXT BOOK

1. Alan Dix- Janet Finlay- Gregory D. Abowd and Russel Beale, "*Human – Computer Interaction*", Pearson Education, 3rd Edition,2004.

REFERENCES

1. Ben Shneiderman and Catherine Plaisant*," Designing the User Interface: Strategies for Effective Human-Computer Interaction*", Pearson Addison-Wesley, 5th Edition, 2009.
2. John M.Caroll, "*Human - Computer Interaction in the Millennium*", Pearson Education, Second Impression, 3rd Edition, 2008.
3. Yvonne Rogers, Heken Sharp, & Jenny Preece, "*Interaction Design: Beyond Human-Computer Interaction",* John Wiley & Sons, Inc, 3rd Edition, 2011.

<table>
<tr><th colspan="16">IT1011 - HUMAN COMPUTER INTERACTION</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="14">Department of Information Technology</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>n</td></tr>
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<tr><td rowspan="2">4</td><td rowspan="2">Broad area (for ‘P’category)</td><td colspan="3">Programming</td><td colspan="3">Networking</td><td>Data base</td><td>Web System</td><td colspan="3">Human Computer Interaction</td><td colspan="2">Platform Technologies</td></tr>
<tr><td colspan="3"></td><td colspan="3"></td><td></td><td></td><td colspan="3">X</td><td colspan="2"></td></tr>
<tr><td>5</td><td>Approval</td><td colspan="14">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
IT1012	**OBJECT ORIENTED PROGRAMMING IN C++**	**3**	**0**	**2**	**4**
	Total contact – 75				
	Prerequisite				
	Nil				
PURPOSE					
Object Oriented Programming (OOP) has become preferred programming paradigm by the software industries, as it offers powerful way to cope with the complexity of the real world problems. This course provides the students with the concepts of OOP from the eyes of C++.					
INSTRUCTIONAL OBJECTIVE					
1.	To learn basic concepts of Object Oriented programming – classes, objects and encapsulation, inheritance and polymorphism.				
2.	To develop generic programs that support data types at runtime and handle exceptions.				
3.	To learn Standard Template Library in C++ and file handling mechanism				

UNIT I-FUNDAMENTALS OF C++ (9 hours)

P**rogramming paradigms** – Procedure Oriented Programming and Object Oriented Programming systems (OOPS) - History of C++- Characteristics of OOPS- ANSI/ISO standard; C++ Tokens - Data Types, keywords; Operators, Arrays, Branching and iterations; Introduction to Standard Library- namespaces- Strings-Vectors

UNIT II-CLASSES AND OBJECTS (9 hours)

Functions-Pointers- Structures – Unions- Classes, Objects– Data Members and Member Functions – Constructors and Destructors –Copy constructors, Parameterized constructors - Static data members and functions; Objects as function arguments – Friend Function – Friend Class.

UNIT III-INHERITANCE AND POLYMORPHISM (9 hours)

Polymorphism- Function overloading – Operator overloading –*this* pointer; Derived classes – Types of Inheritance – Virtual Base Classes – Abstract classes – Virtual Functions – Pure Virtual Functions — Type Conversion – Static and Dynamic binding.

UNIT IV-GENERIC PROGRAMMING AND EXCEPTION HANDLING (9 hours)

Need for Template - Function Template – Class Template – Principles of Exception handling – try,throw,catch – Exception Handling Mechanism – catching multiple exceptions – Rethrowing Exception - Exception Specification – terminate & unexpected functions – uncaught Exception

UNIT V-STL AND FILE HANDLING (9 hours)

Introduction to STL – Standard containers – Algorithms and Function objects – Iterators –Maps, multimap –Lists – File Stream Classes – File operations – File pointers and manipulators – Error handling in Files

LIST OF EXPERIMENTS (30 hours)

1. Programs to Implement Various Control Structures.
2. Programs to understand Strings and Vectors
3. Programs to Understand Structure & Unions.
4. Programs to Understand Pointers.
5. Functions & Recursion.
6. Constructors & Destructors, Copy Constructor.
7. Programs to Understand Friend Function & Friend Class.
8. Programs to Implement Inheritance.
9. Programs to Implement Polymorphism & Function Overloading.
10. Programs to Implement Virtual Functions.
11. Programs to Overload Unary & Binary Operators Both as Member Function & Non Member Function.
12. Programs on Class Templates & Function Templates.
13. Programs Using Exception Handling Mechanism.
14. Programs to Implement STL concept.
15. Programs Using File Stream classes.

TEXT BOOK

1. BjarneStroustrup, "*The C++ Programming Language* ", Pearson Education , 3rd Edition 2010

REFERENCES

1. Harvey M. Deitel and Paul J. Deitel, "*C++ How to Program*", Deitel& Associates, Inc. 2008
2. E.Balagurusamy, "*Object-Oriented Programming with C++*", TMH, 4th Edition, 2008.
3. R.Subburaj ,"*Object Oriented Programming with C++*", Vikas Publishers, New Delhi, 2003

IT1012 OBJECT ORIENTED PROGRAMMING IN C++

Course designed by		Department of Information Technology													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
				X						X					
2	Mapping of instructional objectives with student outcome			1 2						3					
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)				Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming		Networking			Data base			Web System	Human Computer Interaction		Platform Technologies		
		X													
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1013	**PROGRAMMING IN JAVA**	**3**	**0**	**2**	**4**
	Total contact hours – 75				
	Prerequisite				
	Basic knowledge of programming is preferred				

PURPOSE

Java is the foundation of many large scale application projects nowadays in corporate world. Organizations are shifting away from their monolithic mainframe systems to an architecture that will prevent them from making past mistakes again, where programming languages like Java play a major role. Hence this course is targeted towards students who want to learn the core programming concepts in Java.

INSTRUCTIONAL OBJECTIVES

1.	To understand Java Technologies
2.	To learn basic Java programming language features, new language

	features and Java Web start.
3.	To learn Multithreading and File Handling in Java

UNIT I-Fundamentals of Java Technology and Programming (9 Hours)
Java platform features-Java technologies-JSR, JCP. Data types –Key words - Scoping rules- Automatic Type Conversion- Type Casting and Arrays- Operators :Operators Precedence & Associativity – Expression. Flow control-new features from Java5 to Java 7 enhanced for loop, switch statements, handling Strings - Entry point for Java Programs.

UNIT II-CLASSES AND OBJECTS (9 Hours)
Introducing Classes: Class fundamentals- Declaring objects- Assigning object reference variable- Methods & Method Signatures- Method retuning Values- Method with parameters-varargs in Java 5-Constructors- Default Constructor- Parameterized constructor- *this* keyword- Garbage Collector-finalize() method- Overloading methods and constructors- Using object as parameters- returning object in methods- recursion- Access control- static and final keyword- Nested and Inner classes- Command Line argument-String and String Buffer class-Java Bean standards-Naming convensions

UNIT III-INFORMATION HIDING AND REUSABILITY (9 Hours)
Inheritance: Inheritance basics- Using super- Method Overriding-Constructor call- Dynamic method dispatch- Abstract class- Using final with inheritance- Packages:Default Package- Path
& Class Path Environment Variables- Package level access- Importing Packages- Interface:
Multiple Inheritance in Java- Extending interface- Wrapper class.Auto Boxing

UNIT IV-EXCEPTION- CONCURRENCY- AND STREAMS (9 Hours)
Exception handling mechanism- new look try/catch mechanism in Java 7. I/O Basics: Bytestream& Character Stream- Getting user input- Reading console input & Writing console output- Reading and Writing files-new filesystem API NIO2
Multithreading: Thread class & Runnable Interface- Inter Thread Communication- Synchronization of threads using Synchorized keyword and lock method-thread pool and Executors framework-Futures and callables-Fork-Join in Java 7-Deadlock conditions.

UNIT V-ENUMERATION, GENERICS AND COLLECTION FRAME WORK, ANNOTATION (9 Hours)
Enumeration in Java 5 - usage. Annotations: basics of annotation -The Annotated element Interface -Using Default Values -Marker Annotations-

Single-Member Annotations-The Built-In Annotations-Some Restrictions. Generics: Basics-Generics and type safety-Bounded Type-Wild Cards and Bounded Wild Cards-Restrictions. Applets and Java Web Start.

LIST OF EXPERIMENTS **(30 hours)**

1. Programs on Data types and Control structures
2. Programs on Classes ,Objects and its features
3. Programs on inheritance encapsulation, access modifiers and packages
4. Programs on Polymorhism using abstact classes and interface
5. Programs on Exception handling
6. Programs on Multi threading
7. Programs on File Handling
8. Programs on Generics and collection Frameworks
9. Programs on Applets,Java web start
10. Case study on designing a Java project for Banking Actrivity(use UML for Design)
    Hint :(Should use new java features where ever possible)

TEXT BOOK

1. Herbert Schildt,"*The Complete Reference(Fully updated for jdk7)*", Oracle press Edition,2012

REFERENCES

1. Cay S. Horstmann and Gary Cornel,"Core *Java Programming Volume – I*", 9th Edition 2012
2. Deitel & Deitel, "*Java How to Program*", Prentice Hall, 9th Edition, 2012

IT1013 PROGRAMMING IN JAVA															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
				X						X					
2	Mapping of instructional objectives			1 3						2					

	with student outcome														
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)		Professional Subjects (P)					
										X					
4	Broad area (for 'P'category)	Programming			Networking		Data base	Web System		Human Computer Interaction			Platform Technologies		
		X													
5	Approval	23rd meeting of Academic Council, May 2013													

SEMESTER V

		L	T	P	C
PD1005	**APTITUDE III**	**1**	**0**	**1**	**1**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				

PURPOSE	
To enhance holistic development of students and improve their employability skills.	
INSTRUCTIONAL OBJECTIVES	
1.	Understand the importance of effective communication in the workplace.
2.	Enhance presentation skills – Technical or general in nature.
3.	Improve employability scope through Mock GD, Interview

UNIT I **(6 hours)**

Video Profile

UNIT II **(6 hours)**

Tech Talk / Area of Interest / Extempore / Company Profile

UNIT III **(6 hours)**
Curriculum Vitae

UNIT IV **(6 hours)**
Mock Interview

UNIT V **(6 hours)**
Group Discussion / Case Study

ASSESSMENT

1. Objective type – Paper based / Online – Time based test
2. 50% marks based on test, 50 % based on Continuous Communication assessment

REFERENCES

1. Bovee Courtland and Throill John, *Business Communication Essentials: A skills-Based Approach to Vital Business English*. Pearson Education Inc., 2011
2. Dhanavel, S.P., *English & Communication Skills for Students of Science and Engineering*. Orient Black Swan, 2009
3. Rizvi M. Ashraf ,*Effective Technical Communication*, Tata McGraw-Hill Publishing Company Limited, 2006.

PD1005 APTITUDE III													
Course designed by		**Career Development Centre**											
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k	
								X		X	X		
2	Mapping of instructional objectives with student outcome							1,2, 3		1,2		2, 3	
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)				Professional Subjects (P)		

		X			
4	Approval	23rd meeting of Academic Council, May 2013			

		L	T	P	C
IT1014	**SYSTEM INTEGRATION AND ARCHITECTURE**	**3**	**0**	**0**	**3**
	Total contact hours –45				
	Prerequisite				
	Knowledge in Object Oriented Analysis and Design is preferred				

PURPOSE

As Software development is an expensive process, proper measures are required so that the resources can be used efficiently and effectively. Thus this course is to provide the students with the concepts of development of projects in a structured and organized way. It also makes them understand the problems involved in system integration, deployment and project management. This course also shows them how a disciplined engineering approach in the development of projects makes it easier, effective and efficient.

INSTRUCTIONAL OBJECTIVES

1.	Understand the phases in a software project compare different process models and decide on appropriate model to choose.
2.	Comprehend the requirements of stakeholders; analyze the same and effectively design based on requirements.
3.	Understand the major considerations for enterprise integration and deployment.
4.	Cognize the current testing standards and maintenance strategies.
5.	Identify the key activities in managing a software project

UNIT I-INTRODUCTION TO SOFTWARE PROCESS MODELS

(5 hours)

Software Life Cycle Phases, Software Process Models – Waterfall, Incremental, RAD/RUP, Spiral, COTS. Introduction to Agile Development Principles

UNIT II-REQUIREMENTS MODELING, ANALYSIS AND DESIGN

(12 hours)

Understanding Requirements – FR & NFR, Elicitation & Analysis, Requirements Modeling (Scenarios, Information, and Analysis Classes Flow, Behavior, Patterns, and WebApps), Design Concepts. Types of Design – Architectural & User Interface Design.

UNIT III-INTEGRATION AND DEPLOYMENT (10 hours)

Integration - Components, Interfaces, Infrastructure, Middleware platforms, Wrapper & Glue Code Approach, Architectural Frameworks (ITIL, ISO 20,000, SOA), Organizational Culture **Deployment** : Pilot Release, User Acceptance Testing. **Enterprise Integration Applications** – CRM & ERP

UNIT IV-MAINTENANCE, TESTING AND QA (9 hours)

Maintenance: User support plans and System Support Strategies, Maintenance Cost. **Testing Techniques** - White Box Testing & Black Box Testing Techniques. **Strategies** – Unit Testing, Integration Testing, Usability, Validation Testing & System Testing. **QA** – Quality Concepts, SQA.

UNIT V- PROJECT MANAGEMENT (9 hours)

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**.

TEXT BOOK

1. Ian Sommerville, "*Software Engineering",* Addison Wesley, 9th Edition, 2011,ISBN: 9780137035151

REFERENCES

1. Roger S. Pressman, "*Software Engineering A Practitioner's Approach",* McGraw Hill, 7th Edition, 2009, ISBN: 9780071267823
2. Mostafa Hashem Sherif ,"*Handbook of Enterprise Integration*", 1st Edition, 2010 ISBN:9781420078213
3. Larry Klosterboer, "*Implementing ITIL Change and Release Management*", 2009, First Edition, ISBN:9780138150419
4. William A. Ruh, Francis X. Maginnis, William J. Brown , "*Enterprise Application Integration*" A Wiley Tech Brief, ISBN: 978-0-471-43786-4, 1st Edition , 2002.

IT1014 SYSTEM INTEGRATION AND ARCHITECTURE															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
				X							X	X	X	X	X
2	Mapping			2							1	1	3	2	5

	of instructional objectives with student outcome			4							2	24				
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)					
											X					
4	Broad area (for 'P'category)	Programming			Networking		Data base		Web System		Human Computer Interaction		Platform Technologies			
		X														
5	Approval	23rd meeting of Academic Council, May 2013														

		L	T	P	C
IT1015	**DATABASE MANAGEMENT SYSTEMS**	**3**	**0**	**2**	**4**
	Total contact hours – 75				
	Prerequisite				
	Knowledge in Discrete Mathematics and Fundamentals of IT is preferred				

PURPOSE

Organizations depend on databases for storing the data and to share the data among different kinds of users for their business operations. Persistent storage is required and several users must be able to safely access the same data concurrently. Hence this course discusses about the problems with file processing system and how it can be handled effectively in Database Systems through various design tools, techniques and algorithms

INSTRUCTIONAL OBJECTIVES	
1.	Learn the fundamentals of Database management and to design the database for any given problem.
2.	Understand the SQL and provide the proof for good database design.
3.	Know the fundamentals of transaction processing, practical problems of concurrency control and recovery mechanisms.

UNIT I -INTRODUCTION TO DATABASE DESIGN (9 hours)

Data- Database – DBMS-File Processing System Vs DBMS- Approaches to build a Database - Data Independence-Data Catalog-Three schema Architecture of a database-Functional components of DBMS.- DBMS Languages- ER Model: Objects- Attributes and itsType.Entity and Relationship ship-Design Issues of ER model-Constraints.

UNIT II-RELATIONAL MODEL AND SQL (9 hours)

Keys-Tabular Representation of Various ERSchema- Overview of Query Processing- Relational Algebra – Fundamental operations- Views- SQL: Overview-The Form of Basic SQL Query -Nested queries - correlated and uncorrelated- UNION- INTERSECT and EXCEPT- Aggregate Functions- - Integrity Constraints in SQL- Embedded SQL.

UNIT III- DEPENDENCIES AND NORMAL FORMS (12 hours)

Importance of a good schema design, - Problems encountered with bad schema designs - Motivation for normal forms- functional dependencies - Armstrong's axioms for FD's- Closure of a set of FD's- Minimal covers- Definitions of 1NF- 2NF- 3NF and BCNF- Decompositions and desirable properties - Algorithms for 3NF and BCNF normalization-Multivalued dependencies-4NF-5NF.

UNIT IV - PHYSICAL IMPLEMENTATION, TRANSACTIONS (7 hours)

Overview of Primary and secondary storage media-file organization-RAID-Transactions-concepts-ACID Properties-Serializability-Concurrency control techniques-Two phase locking mechanism.

UNIT V - RECOVERY (8 hours)

Deadlock management - Prevention-Detection-Recovery. Types of Failures-Undo- Redo techniques.-Log based Recovery-Shadow paging Techniques-ARIES Recovery algorithm. Introduction to parallel & distributed databases.-Emerging Database Technologies and applications: Mobile- Multimedia databases.

LIST OF EXPERIMENTS **(30 hours)**

1. Creating database, table
2. Working with Data Manipulation commands
3. Basic SELECT statements
4. Advanced SELECT statements
5. Integrity and Constraints
6. Joining Tables
7. SQL functions
8. Subqueries
9. Views
10. Basics of PL/SQL
11. Design and Develop applications like banking, reservation system, etc.

TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan," *Database System Concepts*", McGraw-Hill, 6th Edition , 2010.

REFERENCES

1. Raghu Ramakrishnan, Johannes Gehrke, "*Database Management System*", McGraw Hill., 3rd Edition 2007.
2. Elmasri, Navathe, "*Fundamentals of Database System"*, Addison-Wesley Publishing, 5th Edition, 2008.
3. Date C.J, *An Introduction to Database*, Addison-Wesley Pub Co, 8th Edition , 2006.
4. Peter Rob, Carlos Coronel, *Database Systems – Design, Implementation, and Management*, 9th Edition, Thomson Learning, 2009.

IT1015 DATABASE MANAGEMENT SYSTEMS															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
				X						**X**			**X**		
2	Mapping of instru ctional objectives with student outcome			**1 2**						**2**			**1 3**		

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)		Professional Subjects (P)	
						X	
4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
				X			
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1016	**COMPUTER NETWORKS**	**3**	**0**	**2**	**4**
	Total contact hours –75				
	Prerequisite				
	Knowledge of basic communication systems is preferred				

PURPOSE

Computer Networking is the vital part of any organization these days. This course provides a foundation to understand various principles, protocols and design aspects of Computer Networks and also helps to achieve the fundamental purpose of computer networks in the form of providing access to shared resources.

INSTRUCTIONAL OBJECTIVES

1.	Understand the evolution of computer networks using the layered network architecture.
2.	Design computer networks using sub-netting and routing concepts
3.	Understand the various Medium Access Control techniques and also the characteristics of physical layer functionalities.

UNIT I-INTRODUCTION TO COMPUTER NETWORKS (9 hours)

Evolution of Computer NetworksHistory- Classification of Computer Networks - LAN,WAN,MAN,PAN, INTERNET- Network Topology - BUS, STAR, RING, MESH -Layered Network Architecture - OSI, TCP/IP.

UNIT II-IPV4 ADDRESSING ARCHITECTURE (9 hours)

IP Protocol suite – IPv4 Public and Private Address- Sub-netting-VLSM-CIDR-Network Devices-Router, Switch, HUB, Bridge.

UNIT III-NETWORK LAYER PROTOCOLS (9 hours)

Router IOS- Static and Default Routing-Interior Gateway Routing Protocols: RIP V1&V2, OSPF, EIGRP- Exterior Gateway Routing Protocol: BGP, Multicasting.

UNIT IV-LOGICAL LINK AND MEDIA ACCESS LAYER (9 hours)

Medium Access Control Techniques - Random, Round Robin, Reservation, ALOHA - Pure and Slotted, CSMA/CD, CSMA/CA, Ethernet, Token Ring, Token Bus, ARQ 3 Types -Error Detection Codes - Parity Check, Checksum, CRC - Error Correction Codes - Hamming codes, Convolution Codes.

UNIT V-PHYSICAL LAYER CHARACTERISTICS (9 hours)

Physical Layer overview – latency, Bandwidth-Delay Product– Transmission Media - Twisted pair, Coaxial, Fibre, Wireless-802.11, 802.15, 802.15.4, 802.16 - Line Coding

LIST OF EXPERIMENTS (30 hours)

1. IP Addressing and sub netting (VLSM)
2. Basic Router Configuration (Creating Passwords, Configuring Interfaces)
3. Static and Default Routing
4. RIPv1
5. RIPv2
6. EIGRP Configuration, Bandwidth, and Adjacencies
7. EIGRP Authentication and Timers
8. Single-Area OSPF Link Costs and Interface
9. Multi-Area OSPF with Stub Areas and Authentication
10. Redistribution Between EIGRP and OSPF

TEXT BOOK

1. William Stallings, "*Data and Computer Communications*", ISBN-10: 0131392050 | ISBN-13: 978-0131392052| Edition 9, 2010.

REFERENCES

1. Behrouz A. Forouzan, "*Data Communications and Networking*" 5th edition, July 1, 2012, ISBN-10: 0073376221, ISBN-13: 978-0073376226.
2. Todd Lammle, "*CCNA Study Guide*", Publication Date: April 5, 2011 | ISBN-10: 0470901071 | ISBN-13: 978-0470901076 | Edition7.

IT1016 COMPUTER NETWORKS	
Course designed by	**Department of Information Technology**

1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
			X	X										X	
2	Mapping of instructional objectives with student outcome		1	2										3	
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P' category)	Programming			Networking		Data base		Web System		Human Computer Interaction		Platform Technologies		
					X										
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1017	**OPERATING SYSTEMS AND LINUX ADMINISTRATION**	**3**	**0**	**2**	**4**
	Total contact hours –75				
	Prerequisite				
	Knowledge of Computer Architecture, Data Structures and Programming is preferred				

PURPOSE

Operating systems are designed for a variety of computer systems like embedded systems, Smartphone, single-user workstations, personal computers, medium-sized shared systems, large mainframes, super computers and specialized machines such as real-time systems. The main purpose of this course is to introduce the fundamental concepts and design issues involved in the development of modern-day operating systems.

INSTRUCTIONAL OBJECTIVES	
1.	Understand the basic concepts and functions of operating systems
2.	Understand how the resources are scheduled and managed
3.	Learn the basics of Linux system and perform administrative tasks on Linux Servers

UNIT I-INTRODUCTION (5 hours)

Computer System Organization-Operating System Structure and Operations-System Calls, System Programs, OS Generation and System Boot.

UNIT II-PROCESS MANAGEMENT (12 hours)

Processes - Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication; Threads- Overview, Multicore Programming, Multithreading Models; Process Synchronization-Critical Section Problem, MutexLocks, Semophores, Monitors; CPU Scheduling and Deadlocks.

UNIT III-MEMORY MANAGEMENT (8 hours)

Main Memory-Contiguous Memory Allocation, Segmentation, Paging, 32 and 64 bit architecture Examples; Virtual Memory- Demand Paging, Page Replacement, Allocation, Thrashing; Allocating Kernel Memory, OS Examples.

UNIT IV-STORAGE MANAGEMENT (10 hours)

Mass Storage Structure- Overview, Disk Scheduling and Management; File System Storage-File Concepts,Directory and Disk Structure, Sharing and Protection; File System Implementation- File System Structure, Directory Structure, Allocation Methods, Free Space Mangement; I/O Systems

UNIT V- LINUX SYSTEM ADMINISTRATION (10 hours)

Linux System- Basic Concepts; System Administration-Requirements for Linux System Administrator, Setting up a LINUX Multifunction Server, Domain Name System, Setting Up Local Network Services; Virtualization-Basic Concepts, Setting Up Xen,VMware on Linux Host and Adding Guest OS.

LIST OF EXPERIMENTS (30 hours)

1. Study of OS161 instructional operating system
2. Building the OS161 kernel from source
3. Modifying the OS161 kernel by adding debugging statements and system calls
4. Providing argument handling features to OS161
5. Implementing thread coordination
6. Installation of Linux OS and user administration

7. Configuration of NFS in Linux
8. Installation and Configuration of HTTP service
9. Setting up of DNS in Linux
10. Creation of Linux based Virtual Machines and setting up communication between them

TEXT BOOK

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, *Operating System Concepts*, John Wiley & Sons ,Inc., 9th Edition,2012, ISBN 978-1-118-06333-0

REFERENCES

1. William Stallings, *Operating System: Internals and Design Principles*, Prentice Hall, 7th Edition,2012, ISBN-10: 013230998X • ISBN-13: 9780132309981
2. Tom Adelstein and Bill Lubanovic, *Linux System Administration*, O'Reilly Media, Inc., 1st Edition, 2007.ISBN-10: 0596009526 | ISBN-13: 978-0596009526
3. Harvey M. Deitel, *Operating Systems*, Prentice Hall, 3rd Edition,2003, ISBN-10: 0131828274 | ISBN-13: 978-0131828278
4. Andrew S. Tanenbaum,*Modern Operating System*, Prentice Hall, 3rd Edition, 2007,ISBN-10: 0136006639 | ISBN-13: 978-0136006633

IT1017 OPERATING SYSTEMS AND LINUX ADMINISTRATION															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
										X		X			
2	Mapping of instructional objectives with student outcome									1 2		3			
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical				Professional Subjects (P)			

				Arts (E)			
						X	
4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
							X
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1047	**INDUSTRIAL TRAINING-I**	**0**	**0**	**0**	**0**
	Prerequisite				
	Nil				
PURPOSE					
The purpose of this course is to provide an industrial exposure for students in organizations related to their field of study.					
INSTRUCTIONAL OBJECTIVES					
Students are required to undergo two weeks of training or internship in any industry. At the end of the training, students shall submit a report, a certificate from the concerned organization and deliver a presentation.					

Students have to undergo two-week practical training in any industry of their choice but with the approval of the department. At the end of the training student will submit a report as per the prescribed format to the department. Students are prohibited from attending the training in any training institutes or project training centers.

Assessment process

This course is mandatory and the student has to pass the course to become eligible for the award of degree. The student shall make a presentation before a committee constituted by the department which will assess the student based on the report submitted and the presentation made. Marks will be awarded out of 100 and appropriate grades assigned as per the regulations.

IT1047 INDUSTRIAL TRAINING-I	
Course designed by	**Department of Information Technology**

1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
					X		X		X					X	
2	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
3	Broad area (for 'P'category)	Programming			Networking			Data base		Web System	Human Computer Interaction			Platform Technologies	
		X			X			X		X	X			X	
4	Approval	23rd meeting of Academic Council, May 2013													

SEMESTER VI

		L	T	P	C
PD1006	**APTITUDE IV**	**1**	**0**	**1**	**1**
	Total Contact Hours - 30				
	Prerequisite				
	Nil				

PURPOSE

To enhance holistic development of students and improve their employability skills.

INSTRUCTIONAL OBJECTIVES

1.	To improve aptitude, problem solving skills and reasoning ability of the student.
2.	To collectively solve problems in teams & group.

UNIT I-ARITHMETIC – II **(6 hours)**

Ratios & Proportions, Averages, Mixtures & Solutions

UNIT II -ARITHMETIC – III **(6 hours)**

Time, Speed & Distance, Time & Work

UNIT III-ALGEBRA – II **(6 hours)**

Quadratic Equations, Linear equations & inequalities

UNIT IV–GEOMETRY **(6 hours)**

2D Geometry, Trigonometry, Mensuration

UNIT V–MODERN MATHEMATICS – II (6 hours)

Sets & Functions, Sequences & Series, Data Interpretation, Data Sufficiency

ASSESSMENT

1. Objective type – Paper based / Online – Time based test

REFERENCES

1. Agarwal.R.S – *Quantitative Aptitude for Competitive Examinations,* S Chand Limited 2011
2. Abhijit Guha, *Quantitative Aptitude for Competitive Examinations,* Tata Mcgraw Hill, 3rd Edition
3. Edgar Thrope, *Test Of Reasoning For Competitive Examinations,* Tata Mcgraw Hill, 4th Edition

PD1006 APTITUDE IV												
Course designed by		**Career Development Centre**										
1	Student Outcome	A	b	c	d	e	f	g	h	i	j	k
		X			X							
2	Mapping of instructional objectives with student outcome	1-2			1-2							
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
		X										
4	Approval	23rd meeting of Academic Council, May 2013										

		L	T	P	C
MA1026	**STATISTICS FOR INFORMATION TECHNOLOGY**	**4**	**0**	**0**	**4**
	Total contact hours -60 hours				
	(IT)				

PURPOSE	
To develop an understanding of the methods of statistics which are used to model engineering problems.	
INSTRUCTIONAL OBJECTIVES	
1	To gain knowledge in measures of central tendency and dispersion
2	To learn about methods of studying correlation and regression.
3	To have knowledge about analysis of time series
4	To gain knowledge about ANOVA
5	To understand the fundamentals of quality control and the methods used to control systems and processes

UNIT I-INTRODUCTION TO STATISTICS (numerical problems only) (12 hours)

Handling univariate and bivariate data - Measures of central tendency - Measures of dispersion -Skewness & Kurtosis.

UNIT II-CORRELATION AND REGRESSION ANALYSIS (12 hours)

Methods of studying correlation – Karl pearson's coefficient of correlation- Rank correlation method – Regression analysis – Regression lines – Regression equations – Regression coefficients

UNIT III-ANALYSIS OF TIME SERIES (12 hours)

Components of time series – Problems of classifications – Methods of measuring trends – freehand graphing method, semi average method, moving average method and method of least squares- Measurement of seasonal variation – Method of simple averages (weekly, monthly and quarterly) – Ratio to trend method

UNIT IV-ANALYSIS OF VARIANCE (12 hours)

Small sample tests based on t and F distribution - Test for, single mean, difference between means, Paired t-test, test for equality of variances. ANOVA- one -way classification, Two-way classification.

UNIT V-STATISTICAL QUALITY CONTROL (12 hours)

Introduction - Process control - control charts for variables - X and R, X and s charts control charts for attributes : p chart, np chart, c chart.

REFERENCES

1. S.C.Gupta & V.K.Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand and Sons, New Delhi, 11th edition,2007.

2. S.P.Gupta ,Elements of business Statistics, Sultan Chand and Sons, New Delhi, 1993.
3. S.C.Gupta & V.K.Kapoor, Fundamentals of Applied Statistics, Sultan Chand and Sons, New Delhi, 2003
4. C.Chatfield, "Statistics for Technology-A course in Applied Statistics", Chapman and Hall, 2010.

MA1026 STATISTICS FOR INFORMATION TECHNOLOGY												
Course designed by		**Department of Mathematics**										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X				X						
2	Mapping of instructional objectives with student outcome	1-5				1-5						
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
				X								
4	Broad Area	Structural Engineering		Geotechnical Engineering		Water Resources Engineering		Geomatics Engineering				
5	Approval	23rd meeting of academic council, May 2013										

		L	**T**	**P**	**C**
IT1018	**TCP/IP TECHNOLOGY**	**3**	**0**	**2**	**4**
	Total contact hours –75				
	Prerequisite				
	Knowledge of Computer Networks is preferred				
PURPOSE					
The purpose of this course is to understand the concepts and techniques used					

to design and implement the TCP/IP Internet and it also helps to develop protocols to broaden and enhance the operation of the Internet.	
INSTRUCTIONAL OBJECTIVES	
1.	Understand the transport layer protocol and its characteristics.
2.	Work with client server sockets and develop related applications to communicate with each other.
3.	Learn and understand IPv6 and wide area network technologies.

UNIT I-TRANSPORT LAYER PROTOCOLS (9 hours)

TCP & UDP datagram and its characteristics, RTP, Flow Control and Error Control Mechanisms, Silly Window Syndrome- Clark's and Nagle Algorithm - Congestion Control Mechanisms - Token Bucket and Leaky Bucket.

UNIT II-SOCKET PROGRAMMING (9 hours)

Introduction to socket programming- Concurrent Processing in Client-Server Software-Byte ordering and address conversion functions – Socket Interface - System calls used with sockets - Iterative server and concurrent server- Multi protocol and Multi service server- TCP/UDP Client server programs – Thread Creation and Termination – TCP Echo Server using threads- Remote Procedure Call.

UNIT III-APPLICATION LAYER PROTOCOLS (9 hours)

Client Server Model: DNS, TELNET, FTP - HTTP: Introduction, performance, caching and proxies–WWW- DHCP - DORA - Electronic Mail - SMTP, POP3 - PING, TRACE ROUTE.

UNIT IV-NEXT GENERATION INTERNET PROTOCOL (9 hours)

Introduction to IPv6 – IPv6 advanced features –V4 and V6 header comparison – V6 address types –Stateless auto configuration – IPv6 routing protocols – IPv4-V6 Tunnelling and Translation Techniques.

UNIT V- WAN TECHNOLOGIES (9 hours)

Electromagnetic Spectrum - DSL and Cable Technology -Packet Switching – HDLC, PPP, Frame Relay, ATM, MPLS, WIFI and WIMAX.

LIST OF EXPERIMENTS (30 hours)

SOCKET PROGRAMMING

1. Study of necessary header files with respect to socket programming.
2. Study of Basic Functions of Socket Programming
2. Simple TCP/IP Client Server Communication
3. UDP Echo Client Server Communication

4. Concurrent TCP/IP Day-Time Server
5. Half Duplex Chat Using TCP/IP
6. Full Duplex Chat Using TCP/IP
7. Implementation of File Transfer Protocol
8. Remote Command Execution Using UDP
9. ARP Implementation Using UDP

CONFIGURING IPV6 USING GNS

1. Configuring OSPF for IPv6
2. Using Manual IPv6 Tunnels with EIGRP for IPv6
3. Configuring 6to4 Tunnels
4. IPv6 Challenge Lab

TEXT BOOKS

1. Douglas E. Comer, *Internetworking with TCP/IP, Principles, protocols, and architecture*, Vol 1 5th Edition, Publication Date: July 10, 2005 | ISBN-10: 0131876716 | ISBN-13: 978-0131876712 |
2. Douglas E. Comer, *Internetworking with TCP/IP principles*, Volume III, Client-Server Programming and Application, Publication Date: September 21, 2000 | ISBN-10: 0130320714 | ISBN-13: 978-0130320711 | Edition1.

REFERENCES

1. Wendell Odom, *Official Certification Guide*, CCNP Route 642-902, CCIE, Pearson publication.
2. Behrouz A. Forouzan, *Data Communications and Networking*, 5th edition, July 1, 2012, ISBN-10: 0073376221, ISBN-13: 978-0073376226.

IT1018 TCP/IP TECHNOLOGY															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
											X			X	
2	Mapping of instr uctional										1 2			3	

	objectives with student outcome														
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming			Networking		Data base		Web System		Human Computer Interaction		Platform Technologies		
					X										
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1019	**INFORMATION AND STORAGE MANAGEMENT**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Knowledge in Database Management Systems, Computer Networks is preferred				

PURPOSE

Information Storage and Management have highly developed into a sophisticated pillar of information technology, provides a variety of solutions for storing, managing, accessing, protecting, securing, sharing and optimizing information.

INSTRUCTIONAL OBJECTIVES

1.	Identify the components of managing the data center and Understand logical and physical components of a storage infrastructure.
2.	Evaluate storage architectures, including storage subsystems SAN, NAS, IPSAN,CAS
3.	Understand thebusiness continuity, backup and recovery methods.

UNIT I-INTRODUCTION TO STORAGE AND MANAGEMENT **(9 hours)**

Introduction to Information Storage Management - Data Center Environment–Database Management System (DBMS) - Host - Connectivity – Storage-Disk Drive Components- Intelligent Storage System -Components of an Intelligent Storage System- Storage Provisioning- Types of Intelligent Storage Systems

UNIT II-STORAGE NETWORKING (9 hours)

Fibre Channel: Overview - SAN and Its Evolution -Components of FC SAN -FC Connectivity-FC Architecture- IPSAN-FCOE-FCIP-Network-Attached Storage-General-Purpose Servers versus NAS Devices - Benefits of NAS- File Systems and Network File Sharing-Components of NAS - NAS I/O Operation -NAS Implementations -NAS File-Sharing Protocols-Object-Based Storage Devices-Content-Addressed Storage -CAS Use Cases.

UNIT III-BACKUP AND RECOVERY (9 hours)

Business Continuity -Information Availability -BC Terminology-BC Planning Life Cycle - Failure Analysis -Business Impact Analysis-Backup and Archive - Backup Purpose -Backup Considerations -Backup Granularity - Recovery Considerations -Backup Methods -Backup Architecture - Backup and Restore Operations.

UNIT IV-CLOUD COMPUTING (9 hours)

Cloud Enabling Technologies -Characteristics of Cloud Computing -Benefits of Cloud Computing -Cloud Service Models-Cloud Deployment models-Cloud computing Infrastructure-Cloud Challenges.

IT1019 INFORMATION AND STORAGE MANAGEMENT															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
												X	X	X	
2	Mapping of instr uctional objectives with student outcome											1 3	2 4	5	

3	Category	General (G)	Basic Sciences (B)		Engineering Sciences and Technical Arts (E)	Professional Subjects (P)	
						X	
4	Broad area (for 'P' category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
			X	X			
5	Approval	23rd meeting of Academic Council, May 2013					

UNIT V-SECURING AND MANAGING STORAGE INFRASTRUCTURE **(9 hours)**

Information Security Framework -Storage Security Domains-Security Implementations in Storage Networking - Monitoring the Storage Infrastructure -Storage Infrastructure Management Activities -Storage Infrastructure Management Challenges.

TEXT BOOK

1. EMC Corporation, *Information Storage and Management*, WileyIndia, 2nd Edition, 2011.

REFERENCES

1. Robert Spalding, "*Storage Networks: The Complete Reference"*, Tata McGraw Hill , Osborne, 2003.
2. Marc Farley, *Building Storage Networks*, Tata McGraw Hill , Osborne,2nd edition, 2001.
3. Meeta Gupta, *Storage Area Network Fundamentals*, Pearson Education Limited, 2002.

		L	T	P	C
IT1020	**WEB SYSTEMS AND TECHNOLOGY**	**3**	**0**	**2**	**4**
	Total contact hours - 75				
	Prerequisite				
	Knowledge of programming in Java is preferred				
PURPOSE					

The internet or the World Wide Web is a very important part of modern day life. This course discusses the methodology and the technologies needed to design, develop, and deploy web applications satisfying the requirements in terms of flexibility, extensibility, availability and scalability..	
INSTRUCTIONAL OBJECTIVES	
1.	Understand different internet Technologies,web 2.0 and create a basic website using HTML and Cascading Style Sheets
2.	Design a dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms
3.	Design a server side program using Servlets and JSP
4.	Design a simple web page in PHP, and to present data in XML format.
5.	To get a overview of java specific web services architecture and to enable rich client presentation using AJAX.

UNIT I-WEBSITES BASICS, HTML 5, CSS 3, WEB 2.0 (9 hours)

Web 2.0: Basics-RIA Rich Internet Applications - Collaborations tools - **Understanding websites and web servers:** Understanding Internet - Difference between websites and web server- Internet technologies Overview -Understanding the difference between internet and intranet; **HTML and CSS:** HTML 5.0 , XHTML, CSS 3.

UNIT II-JAVASCRIPT (9 hours)

An introduction to JavaScript–JavaScript DOM Model-Date and Objects,-Regular Expressions- Exception Handling-Validation-Built-in objects-Event Handling-DHTML with JavaScript.

UNIT III-SERVER SIDE PROGRAMMING (9 hours)

Servlets: Java Servlet Architecture- Servlet Life Cycle- Form GET and POST actions- Session Handling- Understanding Cookies- Installing and Configuring Apache Tomcat Web Server;**JSP:** Understanding Java Server Pages-JSP Standard Tag Library(JSTL)-Creating HTML forms by embedding JSP code

UNIT IV-PHP and XML (9 hours)

An introduction to PHP: PHP- Using PHP- Variables- Program control-Built-in functions-Connecting to Database – Using Cookies-Regular Expressions;**XML:** Basic XML- Document Type Definition- XML Schema DOM and Presenting XML, XML Parsers and Validation, XSL and XSLT Transformation, News Feed (RSS and ATOM).

UNIT V-INTRODUCTION TO AJAX and WEB SERVICES (9 hours)

AJAX: Ajax Client Server Architecture-XMLHttpRequest Object-Call Back Methods; **Web Services:** Introduction- Java web services Basics – Creating, Publishing ,Testing and Describing a Web services(WSDL)-Consuming a web service, Database Driven web service from an application -SOAP

LIST OF EXPERIMENTS (30 hours)

1. Create a simple webpage using HTML5 Semantic and Structural Elements
2. Create a webpage using HTML5 Media Elements
3. Add a Cascading Style sheet for designing the web page.
4. Design a dynamic web page with validation using JavaScript.
5. Simple applications to demonstrate Servlets.
6. Simple applications using JSP and AJAX
7. Design a simple online test web page in PHP.
8. Design simple application for accessing the data using XML
9. Application for web services

TEXT BOOK

1. Deitel, Deitel& Nieto, *Internet and World Wide Web - How to Program*, Prentice Hall, 5th Edition,2011.

REFERENCES

1. Stephen Wynkoop, *Running a perfect website*, QUE, 2nd Edition,1999.
2. Chris Bates, *Web Programming – Building Intranet applications*, Wiley Publications, 3rd Edition, 2009.
3. Jeffrey C. Jackson, *Web Technologies A computer Science Perspective*, Pearson, 2011
4. www.W3Schools.org

IT1020 WEB SYSTEMS AND TECHNOLOGY															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
										X	X	X	X	X	
2	Mapping of instructional objectives with student outcome									4	5	2	3	1	
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technica		Professional Subjects (P)					

				l Arts (E)			
						X	
4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
					X		
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1049	**MINOR PROJECT**	**0**	**0**	**2**	**1**
	Prerequisite				
	Knowledge gained in courses of all the previous semesters is preferred				

PURPOSE

The purpose of this course is to ensure that students use the acquired knowledge and skills to carry out a mini project which will enable them to gain required skills to carry out a major project in their eighth semester of study. The nature of the project may be interdepartmental.

GUIDELINES

- A team shall have a maximum of three students.
- Every project will have a mentor to guide the students and monitor the progress of the project.
- Periodical reviews shall be conducted and upon completion of the project, a report is to be submitted by every team for evaluation

IT1049 MINOR PROJECT														
Course designed by		**Department of Information Technology**												
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
		X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)					Professional Subjects (P)		
												X		
3	Broad area (for 'P'catego	Programming		Networking			Data base		Web System			Human Computer		Platform Techn

	ry)					Interacti on	ologies
		X	X	X	X	X	X
4	Approval	23rd meeting of Academic Council, May 2013					

SEMESTER VII

		L	T	P	C
IT1021	**INFORMATION ASSURANCE AND SECURITY**	**3**	**0**	**0**	**3**
	Total contact hours – 45				
	Prerequisite				
	Knowledge in networking is preferred				

PURPOSE

The internet or the World Wide Web is a very important part of modern day life. This course discusses the methodology and the technologies needed to design, develop, and deploy web applications satisfying the requirements in terms of flexibility, extensibility, availability and scalability..

INSTRUCTIONAL OBJECTIVES

1.	Understand the different ways the information systems may be compromised
2.	Understand and apply different countermeasures and protect information
3.	Learn to model threats and analyze software systems
4.	Perform vulnerability testing

UNIT I-INTRODUCTION (9 hours)

History of Information Security, NSTISSC security model, System/security development life-cycle, Implementing security, Information assurance analysis model, Security Principles, Disaster recovery, Forensics;

UNIT II-SECURITY MECHANISMS (9 hours)

Cryptography-Types of ciphers, Popular cryptographic algorithms, Protocols for secure communication, Attacks on cryptosystems, Intrusion detection

UNIT III-OPERATIONAL ISSUES AND POLICY (9 hours)

Trends, Auditing, Cost / benefit analysis framework, Asset Management, Legal and ethical issues; Policy-Creation of Policies, Maintenance of Policies, Prevention, Avoidance, Incident Response process

UNIT IV-ATTACKS AND SECURITY DOMAINS (9 hours)

Social Engineering, Denial of Service, Active attacks, Passive Attacks, Buffer Overflow Attacks, Malware; Security Domains: Human-Computer Interaction, Information Management, Integrative Programming, Networking, Program Fundamentals, Platform Technologies, System Administration, System Integration and Architecture, Social and Professional Issues, Web Systems, Physical plant.

UNIT V-SECURITY SERVICES (9 hours)

Threat modeling-Secure design through threat modeling, Determine threats, Ranking threats, Respond to threats, Mitigate threats; Security techniques-Authentication, Authorization, Tamper-resistant and privacy-enhanced technologies;Vulnerabilities: Perpetrators, Inside attacks, External attacks, Black Hat, White Hat, Ignorance, Carelessness, Network, Physical access, etc.

TEXT BOOK

1. Michael E.Whitman and Herbert J.Mattord, "*Principles of Information Security*", 4th edition, Thomson Publications.

REFERENCES

1. Michael Howard and David LeBlanc, "*Writing Secure Code*" Microsoft Press, 2nd edition, USA,2003.
2. Kevin Mandia, Chris Prosise, "*Incident Response-Investigating Computer Crime*", Tata McGraw Hill, 2003
3. William Stallings, " *Cryptography and Network Security- principles and practice*", Pearson, 6thEdition, ISBN 13: 978-0-13-335469-0

IT1021 INFORMATION ASSURANCE AND SECURITY															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
			X			X				X	X			X	
2	Mapping of instructional objectives with student outcome		2 3 4			1 3 4				2 3 4	1 2 3 4			2 3 4	
3	Category	General (G)			Basic Sciences			Engineering			Professional Subjects (P)				

			(B)		Sciences and Technical Arts (E)		
						X	
4	Broad area (for 'P'category)	Programming	Net working	Data base	Web System	Human Computer Interaction	Platform Technologies
			X				
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1022	**INTEGRATIVE PROGRAMMING AND TECHNOLOGIES**	**3**	**0**	**2**	**4**
	Total conduct hours – 75				
	Prerequisite				
	Knowledge of programming in Java is preferred				

PURPOSE

The purpose of this course is to enhance the students with the concepts of integrative programming techniques. This also helps them to develop components in different programming languages and integrate them using web architectures.

INSTRUCTIONAL OBJECTIVES

1.	Understand the benefits of Integration of languages, especially the issues related with the integration of java with other languages like Assembly, C, C++ using JNI.
2.	Explore core object-oriented design patterns of J2EE and their applications.
3.	Understand and create components in Microsoft Environment and EJB.
4.	Develop an architect web services using Java

UNIT I- LANGUAGE INTEROPERABILITY IN JAVA (9 hours)

Using non-Java code: The Java Native Interface - Calling a native method - Implementing your DLL - Accessing JNI functions - Passing and using Java objects - JNI and Java exceptions-JNI and threading

UNIT II- MESSAGE QUEUING (9 hours)

Understanding MSMQ: What is MSMQ- **Advanced MSMQ components**: Queue, Messages - MSMQ Object Model- MSMQ setup- **MSMQ Basics:** Message Transmittal, Message Receipt, MSMQ Events, MSMQ Transactions

UNIT III-DESIGN PATTERNS (9 hours)

Introducing a Design Pattern - Role of Design Patterns -**Types of Patterns:** Front Controller, Composite View, Composite Entity, Intercepting Filter, Transfer Object, Session Facade, Service Locator,Data Access Object, View Helper, Dispatcher View,Service To Worker

UNIT IV- ENTERPRISE JAVA BEANS (9 hours)

Introduction to J2EE : Need for J2EE, Overview on the J2EE, Architecture, J2EE Key Standards - **Introduction to EJB3 :** The EJB Model, Key Services of the Application Server - **Developing Session Beans**: Stateless Session Beans, Stateful Session Beans, Packaging, Writing Clients- **Messaging & Message Driven Beans :** JMS Overview, JMS Message Driven Beans, Custom Messaging Types.

UNIT V-WEB SERVICES ARCHITECTURE AND TECHNOLOGIES (9 hours)

SOAP: Anatomy of a SOAP Message – Encoding – Message Exchange Model – Communication - SOAP messaging – SOAP Binding for Transport protocols – Security - Building SOAP web services. **Description and Discovery of web services**:**WSDL**: Anatomy of a WSDL Definition Document – WSDL Bindings – Tools – Future and Limitations of WSDL – **UDDI:** UDDI Registries – Programming in UDDI – Inquiry API – Publishing API – Implementation of UDDI – Workflow of UDDI.

LIST OF EXPERIMENTS (30 hours)

1. **RMI**
    a. File Transfer
    b. With Servlet to Perform different arithmetic operation
2. **JNI**
    a. Object Passing
    b. Sorting Array
    c. Different Data Types and Exception handling
3. **MSMQ Using VB**
    a. Passing message using MSMQ
4. **JAVA BEANS**
    a. Account Details –Using Non-Visual Bean
    b. Color Bean – Using Visual Bean

5. **EJB**
    a. Session bean
    b. Entity bean
6. **Web Service**
    a. Implemention of webService using Java

TEXT BOOKS

1. *Java server Programming (J2EE 1.6)* Black Book, Kogent Learning Solution Inc. Dream Tech Press 2009, Platinum Edition
2. Ash Rofail, Yasser Shohoud, *Mastering COM and COM+*, BPB Publications, New Delhi 2000.
3. Ramesh Nagappan, Robert Skoczylas, Rima Patel Sriganesh, *Developing Java Web Services*, Wiley India Pvt. Ltd, 2010

<table>
<tr><th colspan="16">IT1022 INTEGRATIVE PROGRAMMING AND TECHNOLOGIES</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="14">Department of Information Technology</td></tr>
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4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
		X	X		X		
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1023	**MANAGEMENT INFORMATION SYSTEMS**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Basic Knowledge On Information System				

PURPOSE

This course is all about the roles and applications of MIS in the business organization with the new advent of information technology. It also provides the idea of security and managerial issues

INSTRUCTIONAL OBJECTIVES

1.	Obtain knowledge of MIS and its types
2.	Apply the MIS concepts in real time applications
3.	Understand Social and managerial issues of MIS.

UNIT I-INTRODUCTION (7 hours)

Introduction-Definition-Need and Objective of Information Systems-Importance of MIS-Components of an Information System-Types of Information System: Operation support systems and management support systems. Typical Management Information system.

UNIT II-INFORMATION TECHNOLOGY INFRA STRUCTURE (11 hours)

MIS infrastructure and architectures-Computer hardware-Computer Software: Application Software-System Software .Data Resource Management-Telecommunication and Networks

UNIT III- BUSINESS APPLICATIONS (9 hours)

Enterprise MIS,e-business, and MIS in business functional areas-E-commerce-Decision support systems-Artificial intelligence techniques in business.

UNIT IV- INFORMATION SYSTEMS DEVELOPMENT PROCESS (10 hours)

System Analysis and Design: System Specification-Organizational context of Systems analysis-Role of System Analyst-System Development Life Cycle – Requirement Analysis-Requirement Specfications- Design and development phase. Reengineering Business Process.

UNIT V-SOCIAL AND MANAGERIAL ISSUES OF INFORMATION SYSTEMS (8 hours)

MIS security and ethical challenges-Computer Crime: Hacking- Cyber Theft-Software Privacy- Computer viruses and Worms-Cultural factors and global MIS.

TEXT BOOK

1. James A O'Brien,George M Marakas, " *Management Information Systems*"- Tata McGraw-Hill Edition- 2007.

REFERENCES

1. S. Sadagopan, "*Management Information Systems*"-PHI Learning Pvt. Ltd., 01-Aug-2004.

IT1023 MANAGEMENT INFORMATION SYSTEMS															
Course designed by		**Department of Information Technology**													
		a	b	c	d	e	f	g	h	i	j	k	l	m	n
1	Student outcome					X							X	X	
2	Mapping of instructional objectives with					3							2	1	

	student outcome														
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P' category)	Programming			Networking			Database		Web System	Human Computer Interaction			Platform Technologies	
								X							
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1024	**PRINCIPLES OF CLOUD COMPUTING**	**3**	**0**	**2**	**4**
	Total contact hours – 75				
	Prerequisite				
	Knowledge of Computer Networks is preferred				

PURPOSE

Cloud Computing has drawn the attention of industries and researchers worldwide. Many applications that are being built nowadays were developed to suit the needs of cloud environment. Hence it becomes necessary to have course in cloud computing which deals with the basics of cloud, different services offered by cloud, and security issues in cloud. In a nutshell, this course on cloud computing provides information on fundamental aspects of the cloud environment.

INSTRUCTIONAL OBJECTIVES

1.	Learn about different deployment models of cloud and different services offered by cloud
2.	Understand the technique of virtualization through theoretical concepts and practical training
3.	Become knowledgeable in the rudimentary aspects of cloud application development

UNIT I-CLOUD COMPUTING BASICS **(9 hours)**

Cloud computing components- Infrastructure-services- storage applications-database services – Deployment models of Cloud- Services offered by Cloud-Benefits and Limitations of Cloud Computing – Issues in Cloud security-Cloud security services and design principles

UNIT II-VIRTUALIZATION FUNDAMENTALS (9 hours)

Virtualization – Enabling technology for cloud computing- Types of Virtualization- Server Virtualization- Desktop Virtualization – Memory Virtualization – Application and Storage Virtualization- Tools and Products available for Virtualization

UNIT III-SaaS and PaaS (9 hours)

Getting started with SaaS- Understanding the multitenant nature of SaaS solutions- Understanding OpenSaaS Solutions- Understanding Service Oriented Architecture- PaaS- Benefits and Limitations of PaaS

UNIT IV-IaaS AND CLOUD DATA STORAGE (9 hours)

Understanding IaaS- Improving performance through Load balancing- Server Types within IaaS solutions- Utilizing cloud based NAS devices – Understanding Cloud based data storage- Cloud based backup devices- Cloud based database solutions- Cloud based block storage

UNIT V-CLOUD APPLICATION DEVELOPMENT (9 hours)

Client Server Distributed Architecture for cloud – Traditional apps vs. Cloud apps – Client side programming model: Web clients. Mobile clients- Server Side Programming Technologies : AJAX, JSON, Web Services (RPC, REST)- MVC Design Patterns for Cloud Application Development

LIST OF EXPERIMENTS (30 hours)

1. Creation of Virtual Machines
2. Networking with Virtual Machines
3. Private Cloud Setup- using Xen and Eucalyptus
4. Personal Cloud Setup using EyeOS
5. Basic Cloud Application Development exercises

TEXT BOOKS

1. Anthony T .Velte, Toby J.Velte, Robert Elsenpeter, "*Cloud Computing: A Practical Approach*", Tata McGraw Hill Edition, Fourth Reprint, 2010

2. Ronald L.Krutz, Russell vines, "*Cloud Security: A Comprehensive Guide to Secure Cloud Computing*", Wiley Publishing Inc., 2010

REFERENCE

1. Kris Jamsa, "*Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and more*", Jones&Bartlett Learning Company LLC, 2013

<table>
<tr><th colspan="16">IT1024 PRINCIPLES OF CLOUD COMPUTING</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="14">Department of Information Technology</td></tr>
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<tr><td colspan="3"></td><td colspan="3"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3"></td><td colspan="2">X</td></tr>
<tr><td>5</td><td>Approval</td><td colspan="14">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
IT1048	**INDUSTRIAL TRAINING-II**	**0**	**0**	**0**	**0**
	Prerequisite				

	Nil				

PURPOSE
The purpose of this course is to provide an industrial exposure for students in organizations, related to their field of study.
INSTRUCTIONAL OBJECTIVES
Students are required to undergo two weeks of training or internship in IT or ITES industry. At the end of the training, students shall submit a report, a certificate from the concerned organization and deliver a presentation.

Students have to undergo two-week practical training in IT or ITES industry but with the approval of the department. At the end of the training student will submit a report as per the prescribed format to the department.

Assessment process

This course is mandatory and the student has to pass the course to become eligible for the award of degree. The student shall make a presentation before a committee constituted by the department which will assess the student based on the report submitted and the presentation made. Marks will be awarded out of 100 and appropriate grades assigned as per the regulations.

IT1048 INDUSTRIAL TRAINING-II															
Course designed by		Department of Information Technology													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
					X		X		X					X	
2	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)						
									X						
3	Broad area (for 'P'category)	Programming		Networking		Data base		Web System	Human Computer Interaction			Platform Technologies			
		X		X		X		X	X			X			
4	Approval	23rd meeting of Academic Council, May 2013													

SEMESTER VIII

		L	**T**	**P**	**C**

IT1050	MAJOR PROJECT/PRACTICE SCHOOL	0	0	24	12
	Prerequisite				
	Knowledge gained in courses of all the previous semesters				

PURPOSE

The purpose of this course is to ensure that students use the acquired knowledge and skills in the course of study to carry out a project work of sufficient complexity, in their area of interest related to their field of study.

GUIDELINES

- A team shall have a maximum of three students .
- Every project will have a mentor to guide the students and monitor the progress of the project.
- Students are also permitted to carryout project work in industries upon due permission from the concerned Head of the Department.
- Three reviews are conducted in a periodical manner to assess the work progress of the students.
- Upon completion of the project, a report is to be submitted by every team for evaluation

IT1050 MAJOR PROJECT/PRACTICE SCHOOL															
Course designed by		Department of Information Technology													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
		X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	Category	General (G)		Basic Sciences (B)			Enginee ring Sciences and Technical Arts (E)		Professional Subjects (P)						
									X						
3	Broad area (for 'P'category)	Programming		Net working			Data base	Web System	Human Computer Interaction				Platform Technologies		
		X		X			X	X	X				X		

4	Approval	23rd meeting of Academic Council, May 2013

OPEN ELECTIVES

		L	T	P	C
IT1201	**INFORMATION SECURITY**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

To provide impeccable knowledge on various technical aspects of Information Security & Computer Security principles

INSTRUCTIONAL OBJECTIVES

1.	To provide foundation for understanding the key issues associated with protecting Computer Systems & Information Assets.
2.	To provide competency in designing consistent & reasonable Information security system with appropriate Scanning & Enumeration mechanisms, determining the level of protection and Response to security incidents.

UNIT I-INTRODUCTION TO INFORMATION SECURITY (9 hours)

Introduction to Information Security, Need for Security - Threats to security & Attacks, Computer System Security and Access Controls - System access and data access.

UNIT II-COMMUNICATION SECURITY (9 hours)

Introduction to cryptography, cryptosystems, Encryption & Decryption Techniques - classical encryption techniques, communication channel used in cryptographic system, various types of ciphers, Cryptanalysis, Hash function and Data integrity, Security of Hashing function.

UNIT III-NETWORK (9 hours)

Introduction to Network Security, Email Security, IP Security, Web Security, Kerberos, X.509 techniques.

UNIT IV-SCANNING & ENUMERATION TECHNOLOGY (9 hours)

Malicious softwares, Firewalls, Honey pots, Intrusion Detection system, Intrusion Prevention system

UNIT V-ETHICS IN INFORMATION SECURITY

(9 hours)

Implementing Information Security, Legal Ethical & Professional issues in Information Security**.**

TEXT BOOKS

1. Matt Bishop ,"*Computer Security: Art and Science" ,* First Edition, ISBN: 0201440997.
2. William Stallings ,"*Cryptography And Network Security*",Fourth Edition,ISBN: 8177587749

REFERENCES

1. Michael E. Whitman, Herbert J. Mattord ,"*Principles of Information Security"* ,Fourth Edition, ISBN: 1111138214
2. Charlie Kaufman, Radia Perlman, Mike Speciner ,"*Network security : private communication in a public world ",* Second Edition, ISBN: 0130460192.
3. Dieter Gollmann ,"*Computer Security* ", Third Edition, ISBN: 0470741155.

IT1201 INFORMATION SECURITY															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
											X				
2	Mapping of instructional objectives with student outcome										**1 2**				
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				

						X	
4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
			X				X
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1202	**INTRODUCTION TO DATABASE MANAGEMENT SYSTEM**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

This course provides the students to understand the problems with file processing system and how it can be handled effectively in Database System through various design tools, design techniques and algorithms.

INSTRUCTIONAL OBJECTIVES

1.	To learn the fundamentals of Database management system.
2.	To design of database for any given problem.
3.	To Understand the basics of SQL.
4.	To Provide the proof for good database design .
5.	To Understand the Bio applications of database.

UNIT I-INTRODUCTION (9 hours)

Data- Database – DBMS-File Processing System Vs DBMS-Data abstraction-Data Independence-Data Catalog-Three schema Architecture of a database-Functional components of a DBMS.- DBMS Languages-Database users and DBA.

UNIT II- DATABASE DESIGN (9 hours)

ER Model: Objects, Attributes and its Type.Entity set and Relationship set-Design Issuesof ER model-Constraints. Keys-primary key, super key, candidate keys. Introduction to relational model-TabularRepresentation of Various ERSchema. ER Diagram Notations- Goals of ER Diagram- Weak Entity Set- Views.

UNIT III-STRUCTURED QUERY LANGUAGE (9 hours)

SQL: Overview,The Form of Basic SQL Query -UNION, INTERSECT, and EXCEPT–join operations: equi join and non equi join-Nested queries - correlated and uncorrelated- Aggregate Functions-Null values.

UNIT IV-DEPENDENCIES AND NORMAL FORMS (9 hours)

Importance of a good schema design, - Problems encountered with bad schema designs, Motivation for normal forms- functional dependencies, - Armstrong's axioms for FD's- Closure of a set of FD's,- Minimal covers- Definitions of 1NF, 2NF, 3NF and BCNF- Decompositions and desirable properties - Algorithms for 3NF and BCNF normalization.

UNIT V-SEQUENCING DTATABASE (9 hours)

Sequencing Databases-(DNA and proteins Sequencing) – GENOME-GenBank and Swiss Prot- Derived Databases-Pfam, BLOCKS, etc. Structure Databases-Collection- validation of Structure Data- PDB and NDB- Derived Databases, SCOP, PALI, etc

TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan," *Database System Concepts*", McGraw-Hill , 6th Edition , 2010.

REFERENCES

1. Raghu Ramakrishnan, Johannes Gehrke, "*Database Management System*", McGraw Hill., 3rd Edition 2007.
2. Elmasri&Navathe,"*Fundamentals of Database System,"* Addison-Wesley Publishing, 5th Edition, 2008.
3. Date C.J, "*An Introduction to Database*", Addison-Wesley Pub Co, 8th Edition , 2006.
4. Peter rob, Carlos Coronel, "*Database Systems – Design, Implementation, and Management"*, 9th Edition, Thomson Learning, 2009.

IT1202 INTRODUCTION TO DATABASE MANAGEMENT SYSTEM																
Course designed by		**Department of Information Technology**														
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n	
			X							X		X				
2	Mapping of instr uctional objectives with student outcome		**1 2**							**5**		**3 4**				
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)								
								X								
4	Broad area (for 'P'category)	Programming		Networking		Data base		Web System		Human Computer Interaction		Platform Technologies				
						X										
5	Approval	23rd meeting of Academic Council, May 2013														

		L	T	P	C
IT1203	**WEB DESIGN**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

To purpose of the course is to provide the knowledge and skills to build creative, interactive, and well-designed Web sites. To balance the technical skills with artistic skills to create web pages that are conceptually interesting, easily navigable, visually pleasing, and functional with web publishing tools and graphics programs including Dreamweaver, Photoshop and Flash.

INSTRUCTIONAL OBJECTIVES	
1.	To understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
2.	To design, create, and maintain of web pages and websites with various multimedia elements.
3.	To develop skills in developing web site with Dreamweaver.
4.	To draw and create symbols in Flash for providing interactivity with the user.
5.	To understand basics of Photoshop and incorporate the artistic skills by applying various brushes and filters

UNIT I-WEB DESIGN INTRODUCTION (9 hours)

Environment and Tools –Web Publishing Fundamentals –Planning a Website

UNIT II-WEB DESIGN – CONCEPTS (9 hours)

Typography and Images –Multimedia Elements –Promoting and maintaining a Website

UNIT III-DREAM WEAVER (9 hours)

Getting Started –Developing a web page –Working with Text and CSS – Adding Images –Working with Links and Navigation –Managing a Web Server and files

UNIT IV-FLASH (9 hours)

Getting Started –Drawing objects –Working with Symbols – Creating Animations

UNIT V-PHOTOSHOP (9 hours)

Photoshop Basics –Working with Layers –Making Selections –Incorporating Color Techniques – Brushes –Filters –Placing Type in an Image

TEXT BOOK

1. Gary B.Shelly, H.Albert Napier, Ollie N. Rivers, "*Web Design: Introductory Concepts and Techniques*", Course Technology, Cengage Learning, Third Edition, 2009.

REFERENCES

1. Sherry Bishop , James E. Shuman , Elizabeth Eisner Reding, "*The Web Collection Revealed Premium Edition: Adobe Dreamweaver CS5, Flash CS5 and Photoshop CS5"*, DELMAR,Cengage Learning, 2010.

2. Tom Negrino, Dori Smith, "*Dreamweaver CS5 for Windows and Macintosh: Visual QuickStart*", Peachpit Press, 2010.
3. Elaine Weinmann, Peter Lourekas, "*Photoshop CS5 for Windows and Macintosh: Visual QuickStart"*, Peachpit Press, 2010.
4. Katherine Ulrich, "*Flash CS5 Professional for Windows and Macintosh: Visual QuickStart",* Peachpit Press, 2011.

<table>
<tr><td colspan="15">IT1203 WEB DESIGN</td></tr>
<tr><td colspan="2">Course designed by</td><td colspan="13">Department of Information Technology</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>n</td></tr>
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<tr><td>5</td><td>Approval</td><td colspan="14">23rd meeting of Academic Council, May 2013</td></tr>
</table>

DEPARTMENT ELECTIVES
DATABASE

		L	T	P	C
IT1101	**DATA WAREHOUSING AND DATA MINING**	**3**	**0**	**0**	**3**
	Total contact hours -45				
	Prerequisite				
	Knowledge of Data base management systems, Probability and Queuing Theory is preferred				

PURPOSE

Dramatic advances in data capture, processing power, data transmission, and storage capabilities are enabling organizations to integrate their various databases into data warehouses. Data mining is primarily used by the companies with a strong consumer focus. It enables these companies to determine the factors such as price, product positioning, or staff skills, and economic indicators, competition, and customer demographics.

INSTRUCTIONAL OBJECTIVES

1.	Provide efficient distribution of information and easy access to data and user friendly reporting environment.
2.	Find the unseen pattern in large volumes of historical data that helps to manage an organization efficiently.
3.	Understand the concepts of various data mining Techniques

UNIT I-DATA **(9 hours)**

Data warehousing Components –Building a Data warehouse –- Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools – Metadata.

UNIT II-BUSINESS ANALYSIS **(9 hours)**

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools – OLAP Tools and the Internet.

UNIT III-DATA MINING **(9 hours)**

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

UNIT IV-ASSOCIATION RULE MINING AND CLASSIFICATION (9 hours)

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

UNIT V-CLUSTERING AND TRENDS IN DATA MINING (9 hours)

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

TEXT BOOKS

1. Alex Berson and Stephen J. Smith, " *Data Warehousing, Data Mining & OLAP*", Tata McGraw – Hill Edition, Thirteenth Reprint 2008.
2. Jiawei Han and MichelineKamber, "*Data Mining Concepts and Techniques*", Third Edition, Elsevier, 2012.

REFERENCES

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, " *Introduction To Data Mining*", Person Education, 2007.
2. K.P. Soman, ShyamDiwakar and V. Ajay ", *Insight into Data mining Theory and Practice*", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, " *Introduction to Data Mining with Case Studies*", Easter Economy Edition, Prentice Hall of India, 2006.
4. Daniel T.Larose, "*Data Mining Methods and Models*", Wiley-Interscience, 2006.

IT1101 DATA WAREHOUSING AND DATA MINING																
Course designed by		Department of Information Technology														
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n	
										X	X					
2	Mapping of instructional objectives with student outcome									1 2 3	2 3					
3	Category	General (G)			Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)						
										X						
4	Broad area (for 'P'category)	Programming			Networking		Data base		Web System	Human Computer Interaction				Platform Technologies		
							X									
5	Approval	23rd meeting of Academic Council, May 2013														

Course code	Course Title	L	T	P	C
IT1102	**KNOWLEDGE MANAGEMENT**	**3**	**0**	**0**	**3**
	Total contact hours -45 Hours				
	Prerequisite				
	Nil				

PURPOSE

Knowledge management is a topic of key interest among businesses which compete with each other to survive in the market. In order to make the students manage knowledge in the data driven world, this course is designed to provide overview on knowledge representation, management, and tools

available for the same.	
INSTRUCTIONAL OBJECTIVES	
1.	Design and develop knowledge-based information systems for knowledge representation, management, and discovery
2.	Understand various knowledge management tools
3.	Discuss about relevant case studies to understand how knowledge management is applied in real time scenario

UNIT -I Introduction (8 Hours)

Understanding Knowledge – Data, Information and Knowledge, Kinds of Knowledge – Experts Knowledge, Knowledge Management Life Cycle – Challenges in KM System Development.

UNIT – II Knowledge Creation and Capturing Techniques. (9 Hours)

Knowledge creation – Nonaka's Model – Knowledge Transformation – Knowledge Architecture. Capturing the tacit knowledge – Expert Evaluation, Fuzzy Reasoning and Quality of Knowledge Capture – Interviewing as a Tacit Knowledge Capture Tool – Knowledge Capturing Techniques – Onsite Observation – Brain Storming – Protocol Analysis – Delphi Method – Concept Mapping – Black Boarding.

UNIT – III Knowledge Codification and Testing (10 Hours)

Modes of knowledge Conversion – Codifying Knowledge – Codification Tools – Knowledge Maps Decision Table and Tree – Frames etc – Knowledge Developers Skill Set. Quality Assurance – Knowledge Testing – Types Logical, User acceptance Testing approaches.

UNIT – IV Knowledge Management Tools and Implementation (9 Hours)

Transferring and Sharing knowledge – Methods – Types of Transfer – Tools – Document Management – Enterprise Portal – Portal Technologies- Knowledge Market -Types – Knowledge Map — Skills Management – Intranet – Extranet – Groupware – Value Chain – Supply Chain Management (SCM)- Customer Relationship Management (CRM) Implementation Framework – Challenges of KM Implementation

UNIT – V Managing Knowledge Workers and CASE Studies

(9 Hours)

Knowledge Workers – Business Roles – Work Adjustment – Technology and Knowledge Worker – Managerial considerations – Managing Knowledge Projects. Case Studies related to Knowledge Mapping, KM Failure, KM Profile.

Text Books:

1.Elias M. Awad, Hassan M, Ghaziri, Knowledge Management,Pearson Education Inc, Prentice Hall (2004)

2. Filemon A. Uriarte. Jr. Introduction to Knowledge Management ASEAN Foundation (2008)

Reference Books :

1. Srikantaiah, T.K., Koenig, M., "*Knowledge Management for the InformationProfessional*" Information Today, Inc., 2000

2 Nonaka, I., Takeuchi, H., "*The Knowledge-Creating Company: How JapaneseCompanies Create the Dynamics of Innovation*", Oxford University Press,1995.

IT1102 KNOWLEDGE MANAGEMENT														
Course Designed by		**Department of Information Technology**												
1.	Student outcome	a	b	c	d	e	f	g	h	i	j	l	m	n
										x		x		
2.	Mapping of instructional objectives with student outcome									2 3		1		
3	Category	General				Basic		Engineerin			Professional			

.		(G)		Science s (B)	g Sciences and Technical Arts (E)		Subjects (P)
						x	
4.	Broad Area	Program ming	Networ king	Da ta Ba se	Web Syst em	Human Compu ter Interact ion	Platform Technolog ies
				x			
5.	Approval	29th meeting of Academic Council, May 2015					

		L	T	P	C
IT1103	**TEXT MINING**	**3**	**0**	**0**	**3**
	Total contact hours – 45				
	Prerequisite				
	Programming knowledge in C++/Perl/Python, Data structures and Algorithms, Probability and Queuing Theory is preferred				

PURPOSE

Text mining is the analysis of data contained in natural language text. The application of text mining techniques is used to solve business problems .Text mining can help an organization derive potentially valuable business insights from text-based content such as word documents, email and postings on social media streams like Facebook, Twitter and LinkedIn..This course covers the techniques for interpreting and retrieving required information from large volume of unstructured texts.

INSTRUCTIONAL OBJECTIVES

1.	Learn the concepts of Machine Learning
2.	Know the concepts of Information Extraction
3.	Understand the concepts of Information Retrieval
4.	Practice and understand the concepts of Classification and Clustering

UNIT I -NATURAL LANGUAGE PROCESSING (9 hours)

Natural Language Processing – Introduction, Indian Languages, Language and Grammar, Morphology, Syntax, Semantics, Discourse, Synthesis, Machine Translation. Implementation - Regular Expressions, Stemmer, POS Taggers, Spell Checkers, Text Summarization, Question, Answer Systems.

UNIT II - INFORMATION EXTRACTION (9 hours)

Information Extraction - Statistical Modeling, Training Set Preparation, Hidden Markov Models, Conditional Random Fields, Model Evaluation, Model Optimization and Hacks. Implementation - HMM POS Taggers, CRF Address Parsers, Rules based Extraction.

UNIT III – INFORMATION RETRIEVAL (9 hours)

Information Retrieval - Precision-Recall – Vector Space Models – Probabilistic Retrieval – Feature Identification – Feature Selection – Term-Document Matrix – Principal Component Analysis – Latent Semantic Indexing – Similarity Measurements – Cross Language Retrieval. Implementation - Plagiarism detection, Dimension Reduction , Query Expansion.

UNIT IV-ALGORITHMIC TECHNIQUES (9 hours)

Probabilistic models - Aspect Models, Polysemy, Topic Proportion , Probabilistic Latent, Semantic Analysis, Expectation Maximization Algorithm, Latent Dirichlet Allocation, Gibbs Sampling, Model Evaluation. Implementation - Clustering Terms, Document Classification, Polysemy Keyword Retrieval.

UNIT V-CLASSIFICATION (9 hours)

Classification - Naïve Bayes Classifier, Neural Net based Classification, Support Vector Machines. Clustering - Agglomerative Clustering, Divisive Clustering, Distance Measures , K-Means,, K-Nearest Neighbors, Co-clustering, Fuzzy C-Means. Implementation - Keywords
Clustering, Document Classification, Taxonomy.

TEXT BOOK

1. Charles.T.Meadow,Bert R Boyce,Donald H Karft, *Text information Retrievel System*, 3rd Edition, 2007.

REFERENCES

1. David Grossman, OphirFrieder, *Information Retrieval – Algorithms and Heuristics*, Springer, 2004.
2. Stefan Buttcher,Charles LA Clarke,Dordon. V.Cormack,*Information Retrieval, Implementing and evaluating Search Engine*, 2010.
3. TanveerSiddiqui, Tiwari, *Natural Language Processing and Information Retrieval*, Oxford University Press, 2008 .
4. Gerald Kowalski, Mary Maybury, *Information Storage and Retrieval Systems*, Springer, 2006.

IT1103 TEXT MINING																
Course designed by		**Department of Information Technology**														
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n	
		X	X													
2	Mapping of instructional objectives with student outcome	2	1 3 4													
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)						
										X						
4	Broad area (for 'P'category)	Programming		Networking		Data base		Web System		Human Computer Interaction		Platform Technologies				
						X										
5	Approval	23rd meeting of Academic Council, May 2013														

		L	T	P	C
IT1104	**DATABASE ADMINISTRATION**	**2**	**0**	**2**	**3**

	Total contact hours - 60				
	Prerequisite				
	Database Management Systems				

PURPOSE
Database administration is the function of managing and maintaining database management systems software. This course includes the concepts those are used to improve the skills in managing the database and to make strong career as Database Administrator for challenging and critical environment.

INSTRUCTIONAL OBJECTIVES	
1.	Understand the architecture of database
2.	Install, create and maintain database.
3.	Understand the backup and recovery concepts.
4.	Configure the database in real time environment

UNIT I -OVERVIEW OF ORACLE AND PHYSICAL STRUCTURE (5 hours)

Introduction - Oracle DB Architecture – Logical and Physical database structure - Instance– Control files – Redo logs Files – Datafiles - Oracle database configuration.

UNIT II-LOGICAL STRUCTURE OF ORACLE (5 hours)

Database Creation - Database Configuration Assistant DBCA – Password Management – Database Design Template - Table spaces – Undo table space – Space Management. Managing the Oracle Instance – Managing database storage structures – Tablespaces and Data Files, Oracle Managed Files, Automatic Storage Management ASM.

UNIT III-PROFILES AND SECURITY (6 hours)

User creation – Authenticating users – Privileges – System privileges – Role creation – Secure Roles – Assigning roles to users -Security in oracle – Database Auditing – Uniform Audit Trails - Memory Management.

UNIT IV-BACKUP AND RECOVERY (8 hours)

Types of failures – Statement failure, User Process failure, Network failure, User error, Instance failure – Background Processes and Recovery - Checkpoint, redo log files and log writer, archiver - Recovery Manager RMAN – Scheduling back up - Flash back recovery – Datapump –import, export.

UNIT V-INTERNAL CONFIGURATION OF ORACLE (6 hours)

ASM - Performance management - Networking – TNS listener- Scheduler

LIST OF EXPERIMENTS (30 hours)

1. Installing Oracle database software
2. Creating the database
3. Creating tablespace and space management
4. Creating Oracle instance
5. Creating the User
6. Creating the privileges
7. Creating the Role
8. RMAN –backup & recovery
9. Flash backup recovery
10. Datapump – Import and Export

TEXT BOOK

1. Tom Best, Maria Billings, *'Oracle Database 10g: Administration Workshop I'*, Oracle Press, Edition 3.1, 2008.

REFERENCES

1. Sam R Alapati, *'Expert Oracle 10g/11g Administration'*, Dreamtech Press, First Edition, 2009.
2. Matthew Hart and Robert G.Freeman, '*Oracle Db 10G Rman Backup & Recovery*' , Tata McGraw-Hill, 2006.
3. http://www.oracle.com/technetwork/tutorials/index.html
4. http://docs.oracle.com/javase/tutorial/
5. http://www.oracle.com/technetwork/database/features/availability/rman-overview-096633.html
6. http://www.youtube.com/watch?v=PIjcMMnSpq4
7. http://www.dba-oracle.com/concepts/rman.htm

IT1104 DATABASE ADMINISTRATION															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
			X							X					
2	Mapping of instructional objectives with student outcome		1 2 3 4							1 2 3 4					
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming			Networking			Data base		Web System	Human Computer Interaction			Platform Technologies	
								X							
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1105	**BACKUP RECOVERY SYSTEMS AND**	**3**	**0**	**0**	**3**

	ARCHITECTURE				
	Total contact hours –45				
	Prerequisite				
	Knowledge on Information Storage and its management is preferred				

PURPOSE

The function of backup and recovery is very important in today's world where systems are frequently subjected to attacks and incidents. In order to understand the principles involved in backup and recovery, this course focuses on the concepts and technologies involved backup and recovery, planning of related activities, backup methods and its related terminology.

INSTRUCTIONAL OBJECTIVES

1.	Describe backup and recovery terminology and operations
2.	Understand various types of storage systems and backup storage media
3.	Examine the steps involved in planning for backup and recovery

UNIT I –INTRODUCTION (6 hours)

Need for backup and recovery – common backup and recovery terminology – components of client/server backup server architecture – flow of data in client/server backup and restore operations

UNIT II–INFORMATION STORAGE CONCEPTS (9 hours)

Components of storage system and disk drive – intelligent storage systems – RAID levels and operations – direct attached storage – benefits of SCSI architecture

UNIT III–CLIENT BASED BACKUP DATA (12 hours)

Backup data – file system and database backup – Microsoft VSS for backup- NDMP – Different forms of virtualization- VMware backup for clients – challenges impacting client backup environments – factors impacting client backup performance

UNIT IV–STORAGE NODE (9 hours)

Components of storage node – Protocols during backup process – types of backup storage media – technologies involved in backup and recovery

UNIT V-BACKUP AND RECOVERY PLANNING (9 hours)

Backup and recovery planning considerations- backup and recovery testing – disaster recovery considerations – key software and hardware products in the backup and recovery – Proposing a backup and recovery solution.

TEXT BOOK

1. *Backup Recovery Systems and Architecture Student Guide*, EMC Education Services

REFERENCES

1. Wei-Dong Zhu; Gary Allenbach; Ross Battaglia; Julie Boudreaux; David Harnick-Shapiro; Heajin Kim; Bob Kreuch; Tim Morgan; Sandip Patel; Martin Willingham, "*Disaster Recovery and Backup Solutions for IBM FileNet P8 Version 4.5.1 Systems*", IBM Redbooks, 2010
2. Techbook: *Backup and Recovery in a SAN*

<table>
<tr><th colspan="15">IT1105 BACKUP RECOVERY SYSTEMS AND ARCHITECTURE</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="13">Department of Information Technology</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>n</td></tr>
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<tr><td>5</td><td>Approval</td><td colspan="13">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
IT1106	**E-COMMERCE**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

Big corporations and financial institutions use the internet to exchange financial data to facilitate domestic and international business. Data integrity and security are very hot and pressing issues for electronic commerce. This course provides a better understanding of the technical aspect and process of E- Commerce.

INSTRUCTIONAL OBJECTIVES

1.	Understand the standards used in Ecommerce, Obtain knowledge on consumer oriented e-commerce applications.
2.	Describe different protocols related to e-commerce.
3.	Understand various Internet Security standards
4.	Understand the capabilities and limitations of intelligent agents and web-based Marketing.

UNIT I-INTRODUCTION (9 hours)

Traditional commerce Vs E commerce - Overview of E-Commerce framework – E-Business models - Different types of E-commerce. Role of Internet – E-commerce and World Wide Web -Advantages of E-commerce.

UNIT II-E-COMMERCE APPLICATIONS (9 hours)

Consumer oriented E-Commerce applications - Mercantile process models - Electronic Payment Systems – Digital Token based EPS – Smart cards – Credit cards – Risks – designing EPS.

UNIT III-ORGANIZATIONAL COMMERCE AND EDI (9 hours)

Electronic Data Interchange: EDI applications in Business – EDI and e Commerce – EDI standardization and implementation – Internet based EDI.

UNIT IV-SECURITY ISSUES IN E-COMMERCE (9 hours)

Internet security standards- secure electronic payment protocols – Cryptography and authentication - Setting up Internet security, maintaining secure information digital signature and other security measures.

UNIT V-INTELLIGENT AGENTS (9 hours)

Definition and capabilities – limitation of agents – security – web based marketing – search engines and Directory registration – online advertisements – Portables and info mechanics – website design issues.

TEXT BOOKS

1. Ravi Kalakota and Andrew B Whinston, "*Frontiers of Electronic Commerce*", Pearson Education Asia,1999.
2. Marilyn Greenstein and Todd M Feinman, "*Electronic Commerce: Security, Risk Management and Control*" Tata McGraw-Hill, 2000.

REFERENCES

1. P. T. Joseph, *E-Commerce: A managerial Perspectives*, Tata McGraw Hill.
2. Judy Strauss and Raymond Frost, *" E Marketing*", PHI, 2002.
3. Brenda Kienan, "*Managing E Commerce Business*", PHI, 2001.
4. Vivek Sharma and Rajiv Sharma, "*Developing ECommerce Sites – an integrated approach*", Pearson Education Asia, 2000.

IT1106 E-COMMERCE															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
						X						X	X	X	
2	Mapping of instru ctional objectives with student outcome					3 4						1	2	1	
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)					
										X					
4	Broad area (for 'P'category)	Programming		Networking		Data base		Web System		Human Computer Interact		Platform Technologies			

						ion	
					X		
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1107	**BUSINESS INTELLIGENCE**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

A well-designed BI solution to provide a consolidated view of key business data not available anywhere else in the organization, giving management visibility. This course provides an adequate knowledge and concepts of business intelligence in improving decision making using the knowledge retrieved from database.

INSTRUCTIONAL OBJECTIVES

1.	Analyze the need of business intelligence; apply Current practices used to transform business data into useful information.
2.	Implement Business intelligence in data mining.
3.	Business intelligence in knowledge storage and retrieval.
4.	Apply the business intelligence in different domain.

UNIT I-NEED FOR BUSINESS INTELLIGENCE (9 hours)

Defining business intelligence - need for business intelligence - building a roadmap - designing and planning business intelligence process - implementing and fine tuning the business intelligence solution - putting business intelligence to work.

UNIT II-IMPLEMENT BUSINESS INTELLIGENCE CONCEPTS (9 hours)

From raw data to marketing information -Customer and transactional file - Internal and external data sources - data enhancements and overlays -Data integrity and ownership - Relational databases and flat files - Updating databases based on constraints of business.

UNIT III-BUSINESS INTELLIGENCE IN DATA MINING (9 hours)

Data warehousing, legacy system, data marts and marketing databases - Relational databases and models - Structured query language – end-user

perspective - Data mining for business intelligence - Online transaction processing - Online analytical processing - Data warehouses and data marts

UNIT IV-BUSINESS INTELLIGENCE IN KNOWLEDGE STORAGE AND RETRIEVAL (9 hours)

Querying data from data servers using SQL -Restructuring transactional files - Recoding alphanumeric and date variables -Date transformation into time periods -Data Import and Transformation - Linear Regression - Regression Output - Regression Transformation - Logistic Regression - Logistic Regression Output.

UNIT V–APPLY BUSINESS INTELLIGENCE (9 hours)

ETL Tools in business intelligence-Application of business intelligence in neural networks-application of business intelligence in artificial intelligence-Case study.

TEXT BOOKS

1. Turban, Sharda, Delen, King, "*Business Intelligence: A Managerial Approach*", Prentice Hall, Edition: 2nd, ISBN: 13-978-0-136-10066-9, 2011.
2. GalitShmueli, Nitin R. Patel and Peter C. Bruce, "*Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner*", Wiley, 2007.

REFERENCE

1. PaulrajPonniah, "*Data Warehousing Fundamentals - A comprehensive guide for IT professionals*", John Wiley publications, 2nd edition, 2010.

IT1107 BUSINESS INTELLIGENCE																
Course designed by		**Department of Information Technology**														
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n	
			X								X					
2	Mapping of instructional objectives with student outcome		1 2 3 4								1 2 3 4					
3	Category	General			Basic			Engine			Professional					

		(G)	Sciences (B)	ering Sciences and Technical Arts (E)		Subjects (P)	
						X	
4	Broad area (for 'P'category)	Programming	Net working	Data base	Web System	Human Computer Interaction	Platform Technologies
				X			
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1108	**BUSINESS ANALYTICS**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

With the recent explosion of big data there are several business analytics companies working to analyze data and apply it to gain insight and drive business planning. The difficulty in ensuring data quality is integrating and reconciling data across different systems, and then deciding what subsets of data to make available. Business analytics focuses on developing new insights and understanding of business performance based on data and statistical methods.

INSTRUCTIONAL OBJECTIVES

1.	Role of Business analytics in marketing and database applications
2.	Use of business analytics in data warehousing architects
3.	To implement business analytics in mining information
4.	Gain the intellectual capital required to provide business analytics services

UNIT I-INTRODUCTION TO BUSINESS ANALYTICS (9 hours)

Overview of business analytics - Examples of BA Applications - Explaining vs. Predicting - Data Mining vs. Statistical Inference - Types of Data Mining Problems - The Data Mining Process - The concept of "Hold Out Data".

UNIT II-BUSINESS ANALYTICS IN MARKETING AND DATABASE APPLICATIONS (9 hours)

Business analytics at the strategic level - link between strategy and deployment of BA - scenarios on strategy and BA - Common database marketing application - obstacles to implementing database marketing application - definition on data mining - classes of data mining methods.

UNIT III-BUSINESS ANALYTICS IN DATA WAREHOUSING (9 hours)

Business analytics at the data warehousing level - why a data warehouse - architects and processes in the data warehouse - business analytics in future - data visualization -multidimensional visualization - specialized visualization.

UNIT IV-BUSINESS ANALYTICS IN MINING (9 hours)

Business analytics and data mining - definition on data mining - classes of data mining methods -grouping method - predictive modeling method - Crisp-dm phase - process model within a phase - business understanding - data understanding - data preparation – modeling – evaluation –deployment.

UNIT V-BUSINESS ANALYTICS SERVICES (9 hours)

Linear logistic regression - jargon classification - graphic and algebraic representation of single predictor problem – outliers - multiple regression - Data mining methods and application - decision network - dark side of analytics in data mining.

TEXT BOOK

1. Daniel S. Putler, Robert E. Krider, "*Customer and Business Analytics: Applied Data mining for business decision making using R*", CRC press, 2012.

REFERENCES

1. Shmueli, Patel and Bruce, "*Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner*", Wiley publication, 2010.
2. Gert H. N. Laursen, JesperThorlund, "*Business Analytics for Managers: Taking Business Intelligence Beyond Reporting*", 2010.

IT1108 BUSINESS ANALYTICS															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
			X							X					
2	Mapping of instructional objectives with student outcome		1 2 3 4							1 2 3 4					
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P' category)	Programming			Networking			Data base		Web System	Human Computer Interaction		Platform Technologies		
								X							
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C

IT1109	ENTERPRISE RESOURCE PLANNING	3	0	0	3
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

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.

INSTRUCTIONAL OBJECTIVES

1.	To understand the components and modules of ERP System
2.	To obtain Knowledge in development and significance of ERP Systems
3.	To understand the business benefits of ERP System

UNIT I-INTRODUCTION (9 hours)

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 hours)

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 hours)

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 hours)

Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software – Epicor – Intutive.

UNIT V-ERP PRESENT AND FUTURE (9 hours)

Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP.

TEXT BOOK

1. Alexis Leon, "*ERP Demystified*", Tata McGraw Hill, 2nd 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.

<table>
<tr><th colspan="15">IT1109 ENTERPRISE RESOURCE PLANNING</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="13">Department of Information Technology</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>n</td></tr>
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<tr><td>5</td><td>Approval</td><td colspan="13">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
IT1110	**DATA SCIENCE AND BIG DATA ANALYTICS**	**2**	**0**	**2**	**3**
	Total contact hours -60				
	Prerequisite				
	Knowledge of Statistics and Probability, Java and XML is preferred				

PURPOSE

Today's world is data-driven world. Increasingly, the efficient operation of organizations across sectors relies on the effective use of vast amounts of data.This course provides grounding in basic and advanced analytic methods and an introduction to big data analytics technology and tools, including MapReduce and Hadoop.

INSTRUCTIONAL OBJECTIVES

1.	Learn about the basics of data Science and to understand the various supervised and Unsupervised learning Techniques.
2.	Bringing together several key technologies used in manipulating, storing, and analyzing big data.
3.	Gain the ability to design highly scalable systems that can accept, process, store, and analyze large volumes of unstructured data in real

UNIT I-INTRODUCTION TO DATA SCIENCE (6 hours)

Introduction: Introduction of Data Science - Getting started with R - Exploratory Data Analysis - Review of probability and probability distributions - Bayes Rule Supervised Learning – Regression - polynomial regression - local regression- k-nearest neighbors.

UNIT II-UNSUPERVISED LEARNING (6 hours)

Unsupervised Learning - Kernel density estimation - k-means - Naive Bayes - Data and Data Scraping Classification – ranking - logistic regression. Ethics - time series - advanced regression - Decision trees - Best practices - feature selection.

UNIT III-BIG DATA FROM DIFFERENT PERSPECTIVES (6 hours)

Big data from business Perspective: Introduction of big data-Characteristics of big data-Data in the warehouse and data in Hadoop- Importance of Big data- Big data Use cases: Patterns for Big data deployment. Big data from Technology Perspective: History of Hadoop-Components of Hadoop-

Application Development in Hadoop-Getting your data in Hadoop-other Hadoop Component.

UNIT IV-INFOSPHERE BIGINSIGHTS (6 hours)

Infosphere Big Insights: Analytics for Big data at rest-A Hadoop -Ready Enterprise - Quality file system-Compression –Administrative tooling-Security-Enterprise Integration – Improved workload scheduling - Adaptive map reduce - Data discovery and visualization - Machine Analytics.

UNIT V-INFOSPHERE STREAMS (6 hours)

Infosphere Streams: Analytics for Big data in motion - Infosphere Streams Basics - working of Infosphere Streams - Stream processing language – Operators - Stream toolkits - Enterprise class

TEXT BOOKS

1. Noreen Burlingame and Lars Nielsen, "*A Simple Introduction to DATA SCIENCE*" 2012
2. Paul Zikopoulos, Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, *Understanding Big Data: Analytics for Enterprise Class Hadoop and streaming Data*, The McGraw-Hill Companies, 2012

LIST OF EXPERIMENTS(30 hours)

1. Preparing and training data, running Naïve Bayes Classifier and K-means based unsupervised learning .
2. Exploring Apache Hadoop and basic exercises
   HDFS Commands
   Word Count program using Hadoop and MapReduce
   Simple streaming with Unix commands
   Streaming with simple scripts
3. BigInsights Web Console
4. Setup and configuration of BigInsights Clusters
5. Scheduling with Oozie
6. Configuring Flume for Data Loading

IT1110 DATA SCIENCE AND BIG DATA ANALYTICS																
Course designed by		Department of Information Technology														
1	Student	a	b	c	d	e	f	g	h	i	j	k	l	m	n	

	outcome	X								X	X				
2	Mapping of instructional objectives with student outcome	1								2 3	2 3				

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)	Professional Subjects (P)
					X

4	Broad area (for 'P' category)	Programming	Net working	Data base	Web System	Human Computer Interaction	Platform Technologies
				X			
5	Approval	23rd meeting of Academic Council, May 2013					

MULTIMEDIA

		L	T	P	C
IT1111	**MULTIMEDIA TOOLS AND APPLICATIONS**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				

	Nil				

PURPOSE	
The main purpose of this course is to make one understand how to use text, images, sound and video to deliver messages and content in meaningful ways. Communicating knowledge using multimedia tools and technological problem solving will be an essential core encountered in modules.	
INSTRUCTIONAL OBJECTIVES	
1.	Gain knowledge about multimedia hardware components
2.	Understand the necessity of various software tools in making multimedia
3.	Obtain knowledge in making 2D graphics and animation using Flash
4.	Gain basic knowledge in making web pages using Dreamweaver

UNIT I–INTRODUCTION (4 hours)

Introduction - Multimedia skills. Multimedia hardware components: Mac and Windows systems - Memory and Storage devices - Input and Output devices -Communication devices.

UNIT II-MULTIMEDIA TOOLS (4 hours)

Basic Software Tools: Text, Image, and Sound Editing tools, Painting and Drawing tools. Animation tools- Making instant multimedia: Office suite. Multimedia Authoring tools: Types, Card and Page based Authoring tools; Icon and Time based Authoring tools.

UNIT III-FLASH-INTRODUCTION (6 hours)

Managing Window & Panels - Creating objects using the primary drawing tools, choosing & applying colors, working with text - modifying graphics - Using symbols and instances.

UNIT IV-FLASH-ANIMATION (8 hours)

Creating animation and effects & techniques, frames & layers, integrating media files with flash, adding sound, importing artwork embedding video, working with 3D Graphics.

UNIT V-DREAMWEAVER (8 hours)

Working with tools, working with text - Inserting Images, using basic HTML in Dreamweaver - Adding Text to web pages - Inserting Images to web pages, setting up tables using frame & forms, adding multimedia elements to Dreamweaver, building style sheets using webpage working with layers - working with timelines - Enhancing web site management and workflow in Dreamweaver.

LIST OF EXPERIMENTS **(30 hours)**

1. Making of Simple Flash Movie, Setting Properties, Frame Rate, Dimensions, andBackground Color
2. Making of Simple Flash Movie with navigation between scenes
3. Making of Simple Flash Movie to illustrate the concept of layers
4. Making of Simple Flash Movie to illustrate motion tweening
5. Making of Simple Flash Movie to shape tweening
6. Making of Simple Flash Movie to include sound layers
7. Make a Simple web page containing almost all the tags of HTML.
8. Develop a Home page for Income Tax department (Simple and Textual) and store it in the directory used for Web Services on the Web-Server.
9. View that web page on the Browser.
10. Enhance the home page by providing links to other sample pages (e.g. Income Tax Zone, Income Tax Detail Form for an individual, Income Tax Notification, Income Tax News etc.)
11. Embed Time and Date on the home page.
12. Further enhance the website by providing User Registration Page. Collect the user details and Display a new web page showing Thanks For Registration. Also write appropriate functions to validate form inputs.
13. Give a login facility to the user with Anonymous name and maintain the session till the User logs out.
14. For user log in attempts, maintain a visitor count.
15. Change the login module of the web page and now connect it to the Income Tax User database on the server. This is to be done to store the registration detail and facilitate login to the user.
16. The login page is to be made in a way that it should also provide facility to change password, if user forget password.

TEXT BOOK

1. Tay Vaughan, "*MULTIMEDIA- Making it Work*", TMH 8th Edition, 2011

REFERENCES

1. Robert Reinhardt& Dowd, "*Flash CS4 Professional Bible*", Wiley publication - 2009
2. Joseph W Lowery ,"*Adobe CS5 Bible Dream weaver Bible*", Wiley publication-2010

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<tr><td>5</td><td>Approval</td><td colspan="13">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
IT1112	**COMPUTER GRAPHICS**	**2**	**0**	**2**	**3**
	Total contact hours – 60				
	Prerequisite				
	Nil				

PURPOSE

This course is designed to provide a comprehensive knowledge to hardware and software principles of interactive raster graphics that includes an introduction to the basic concepts, 2-D and 3-D modeling, transformations, viewing transformations, projections, rendering techniques and various

color models.	
INSTRUCTIONAL OBJECTIVES	
1.	Gain knowledge about graphics hardware devices and software used
2.	Understand the two dimensional graphics and their transformations
3.	Understand the three dimensional graphics and their transformations
4.	Understand illumination and color models
5.	Understand clipping techniques

UNIT I–INTRODUCTION (6 hours)

Introduction : survey of computer graphics, Overview of graphics systems – Video display devices, Raster scan systems, Random scan systems, Graphics monitors and Workstations, Input devices, Hard copy Devices, Graphics Software; Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II-TWO DIMENSIONAL GRAPHICS (6 hours)

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing – viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

UNIT III-THREE DIMENSIONAL GRAPHICS (6 hours)

Three dimensional concepts; Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadraticsurfaces; Blobby objects; Spline representations - Bezier curves and surfaces -B-Spline curves and surfaces.

UNIT IV-THREE DIMENSIONAL TRANSFORMATION AND VIEWING (6 hours)

Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT V-ILLUMINATION AND COLOUR MODELS (6 hours)

Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model -

CMY colour model - HSV colour model - HLS colour model; Colour selection.

LIST OF EXPERIMENTS **(30 hours)**

1. Implement Bresenhams line drawing algorithm.
2. Implement Bresenhams circle drawing algorithm.
3. Implement Bresenhams ellipse drawing algorithm.
4. Implement the Line, Circle and ellipse attributes by drawing "House".
5. Two Dimensional transformations - Translation, Reflection, and Shear.
6. Two Dimensional transformations - Rotation (With and without pivot point), Scaling (With and without pivot point).
7. 2D Transformations – Translation, Scaling, Rotation.
8. 2D Transformations –fixed point scaling, fixed point rotation.
9. Three dimensional transformations - Translation, Rotation, Scaling.
10. 3D transformations - Translation, Rotation, Scaling.
11. Projection of the 3D image.

TEXT BOOK

1. John F. Hughes, Andries van Dam , Morgan McGuire ,David F. Sklar , James D. Foley, Steven K. Feiner, Kurt Akeley,"*Computer Graphics: Principles and Practice*" , ,Addison-Wesley Professional, 3rd Edition, 2013.

REFERENCES

1. Donald Hearn & M. Pauline Baker ,Warren Carithers, "*Computer GraphicsWith Open GL*", Pearson Education,4th Edition,2010.
2. Jeffrey McConnell, "*Computer Graphics: Theory into Practice*", Jones and Bartlett Publishers, 2006.

IT1112 COMPUTER GRAPHICS															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	N
										X	**X**				
2	Mapping of instructional objective									1 **2** **5**	 **3** **4**				

	s with student outcome														
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P' category)	Programming			Networking			Data base			Web System	Human Computer Interaction			Platform Technologies
		X										X			
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1113	**DIGITAL AUDIO AND COMPUTER MUSIC**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE	
The main purpose of this course is to understand and analysis digital audio and speech	
INSTRUCTIONAL OBJECTIVES	
1.	Understand the basic concepts of digital audio and speech
2.	Gain knowledge about speech analysis and classification
3.	Understand MIDI and audio usage in web
4.	Understand audio signal processing and product manufacturing

UNIT I-INTRODUCTION (9 hours)

Digital Audio, Audio processing- Handling audio in MATLAB-Segmentation-Visualization-Sound Generation-Speech: Production-Characteristics of Speech, Speech Understanding

UNIT II–HEARING COMMUNICATION AND AUDIO ANALYSIS (9 hours)

Psychoacoustics-Amplitude and Frequency models-Auditory Scene Analysis-Speech Communication – Quantisation – Parameterisation-Audio Analysis - Analysis Toolkit –Speech Analysis and Classification

UNIT III–DIGITAL AUDIO (9 hours)

Digital Audio Technology-Digital Audio Workstation-Groove Tools and Techniques

UNIT IV–MIDI AND AUDIO IN WEB (9 hours)

MIDI and Electronic Music Technology-Multimedia and the Web-Synchronization-Amplifiers

UNIT V–SIGNAL PROCESSING (9 hours)

Signal processing-Noise Reduction- Surround Sound- Product Manufacturing-Studio Tips and tricks

TEXT BOOKS

1. David Miles Huber and Robert E.Runstein, "*Modern Recording Techniques"-7th Edition*, 2009, Focal Press(ISBN: 978-0-240-81069-0)
2. Francis Rumsey and Tim McCormick, "*Sound and Recording"-6th Edition*, 2009, Focal Press(ISBN: 978-0-24-052163-3)

REFERENCES

1. Ian McLoughlin, "*Applied Speech and Audio Processing with MATLAB"Example*, 2009,Cambridge University Press(ISBN-13 : 978-0-521-13283-1)
2. Michael Talbot and Smith, "*Sound Engineering Explained", 2/e*, 2001, Focal Press (Original ISBN:0-240-51667-2, Indian Reprint ISBN-13: 978-81-312-0820-5)

<table>
<tr><th colspan="16">IT1113 DIGITAL AUDIO AND COMPUTER MUSIC</th></tr>
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		L	T	P	C
IT1114	**GAME PROGRAMMING**	**2**	**0**	**2**	**3**
	Total contact hours – 60				
	Prerequisite				
	Knowledge of 3D graphics and Animation				

PURPOSE

The main purpose of this course is to provide the student with sound programming skills to learn Game design. Integrate technologies such as artificial intelligence to develop interactive game application.

INSTRUCTIONAL OBJECTIVES

1.	To understand principles of Game design and Game Engine design
2.	To gain good knowledge of implementing games in various platform
3.	To make use of artificial intelligence in gaming
4.	To understand different types of animation

UNITI-3D GRAPHICS FOR GAME PROGRAMMING (6 hours)

Coordinate Systems, Ray Tracing, Modeling in Game Production, Vertex Processing, Rasterization, Fragment Processing and Output Merging, Illumination and Shaders, Parametric Curves and Surfaces, Shader Models, Image Texturing, Bump Mapping, Advanced Texturing, Character Animation, Physics-based Simulation

UNITII-GAME DESIGN PRINCIPLES (6 hours)

Character development, Story Telling, Narration, Game Balancing, Core mechanics, Principles of level design, Genres of Games, Collision Detection, Game Logic, Game AI, Path Finding

UNITIII-GAMING ENGINE DESIGN (6 hours)

Renderers, Software Rendering, Hardware Rendering, and Controller based animation, Spatial Sorting, Level of detail, collision detection, standard objects, and physics

UNIT IV-GAMING PLATFORMS AND FRAMEWORKS (6 hours)

Flash, DirectX, OpenGL, Java, Python, XNA with Visual Studio, Mobile Gaming for the Android, iOS, Game engines - Adventure Game Studio, DXStudio, Unity

UNIT V-GAME DEVELOPMENT (6 hours)

Developing 2D and 3D interactive games using OpenGL, DirectX – Isometric and Tile Based Games, Puzzle games, Single Player games, Multi Player games.

LIST OF EXPERIMENTS **(30 hours)**

1. Designing Simple Objects for Games
2. Animating Objects
3. Use of dynamic text
3. Using keyboard controls for games
4. Collision detection
5. Finding shortest path between objects
6. Creating simple games
7. Including different levels and complexity in games

TEXT BOOK

1. Jonathan S. Harbour, "*Beginning Game Programming",* Course Technology PTR, 3rd edition, 2009.

REFERENCES

1. David H. Eberly, "3D *Game Engine Design, Second Edition: A Practical Approach to Real Time Computer Graphics*" Morgan Kaufmann, 2 Edition, 2006.
2. JungHyun Han, "*3D Graphics for Game Programming*", Chapman and Hall/CRC, 1st edition, 2011.
3. Mike McShaffrfy, "*Game Coding Complete"*, Third Edition, Charles River Media, 2009.
4. Ernest Adams and Andrew Rollings, "*Fundamentals of Game Design*", PrenticeHall 1st edition, 2006.
5. Roger E. Pedersen, "*Game Design Foundations",* Edition 2, Jones & Bartlett Learning, 2009.

Course designed by		Department of Information Technology													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
										X				X	
2	Mapping of instruct tional objectives with student outcome									3 4				**1** **2**	
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)		Professional Subjects (P)					
										X					
4	Broad area (for 'P'category)	Programming			Networking		Data base	Web System		Human Computer Interaction				Platform Technologies	
		X								X					
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1115	**MULTIMEDIA NETWORKS**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

To understand the various concepts behind the distribution of multimedia over the network and to get familiar with the various requirements, compression methods and protocols used.

INSTRUCTIONAL OBJECTIVES

1.	To design an effective multimedia networks towards various applications.
2.	To design some compression principles that can be applied to data.
3.	To make analysis of several network standards and issues towards multimedia data.

4.	To design an effective MPEG system and compare with several versions.
5.	To design and implement the use of multimedia data over network on several applications.

UNIT I-INTRODUCTION (9 hours)

Introduction: Multimedia Networks. Multimedia Information Representation: text- images-animation- audio- video- Encoding & Decoding- Moving graphics and images.

UNIT II- EQUIREMENTS, PERFORMANCEANDSECURITYISSUES (9 hours)

Networking Essentials: Peer to Peer and multiplier communications- network performance parameters- multimedia traffic sources - affected factors- traffic requirement-quality of service, legal, privacy and security issues in multimedia networking.

UNIT III-DISTRIBUTING MULTIMEDIA OVER THE NETWORK (9 hours)

Introduction: Compression Methods- Text- Image- Audio-and video Compression. Standards for multimedia communications.

UNIT IV-PROTOCOLS AND STANDARDS (9 hours)

Traditional protocols: Problems with traditional protocols-protocols for multimedia- multicast protocols- throughput of reliable protocols - Protocol implementation- scaling and efficiency issues. **Multimedia standards**: compression standards- joint photographic experts group (JPEG) standard – motion picture experts group(MPEG) standard- H.261 international video coding standard- g.728 audio compression Standard.

UNIT V-MULTIMEDIA NETWORKING APPLICATIONS (9 hours)

Application level framing- audio/video conferences- video servers- multicast web page sharing- audio- video streams in the www- conferencing java applets.**Multimedia networking applications**: multimedia networking in military- medicine- interactive television education- advertising. Trends in multimedia networking.

TEXT BOOK

1. Fred Halsall, "*Multimedia Communications: Applications, Networks, Protocols and Standards*", Addison-Wesley Publishing, Edition, 2001.

REFERENCES

1. Nancy Cox, Charles F. Manley, Francis E. Chea, "*Guide to Multimedia Networking"*, Osborne Asian Edition
2. Ralf Steinmetz, Clara Nahrstedt, "*Multimedia Computing Communications and Applications*", Prentice Hall PTR, 1st Edition ,1995.
3. BorkoFurht, "*Handbook of Multimedia Computing"*, 1999.
4. Franking F. Kuo, "*Multimedia Communications: Protocols and Applications",* Prentice Hall, 1997.

<table>
<tr><th colspan="15">IT1115 MULTIMEDIA NETWORKS</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="13">Department of Information Technology</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>N</td></tr>
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<tr><td>5</td><td>Approval</td><td colspan="13">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
IT1116	**COMPUTER ANIMATION: ALGORITHMS & TECHNIQUES**	**2**	**0**	**2**	**3**
	Total contact hours – 60				
	Prerequisite				
	Nil				

PURPOSE

This course mainly gives the idea to create two dimensional, three dimensional graphics and animation algorithm

INSTRUCTIONAL OBJECTIVES

1.	To understand the two dimensional graphics and their transformations
2.	To understand the three dimensional graphics and their transformations
3.	To know about graphics hardware devices
4.	To understand 2D and 3D animation techniques

UNIT I-INTRODUCTION (6 hours)

Introduction : survey of computer graphics, Overview of graphics systems – Video display devices, Raster scan systems, Random scan systems, Graphics monitors and Workstations, Input devices, Hard copy Devices, Graphics Software; Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II-2D GRAPHICS & 3D GRAPHICS (6hours)

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations;widow-to-viewport coordinate transformation, Three dimensional concepts; Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations - Bezier curves and surfaces

UNIT III-FUNDAMENTALS OF ANIMATION (6 hours)

Animation production –history of animation-Technical Background: display pipeline-homogeneous coordinates and transformation matrix-compounding transformation-basic transformation- Extracting Transformations-Description of Transformations in the Display Pipeline- Orientation Representation

UNIT IV-ANIMATION TECHINIQUES (6 hours)

Interpolation and Basic Techniques: controlling the motion along a curve-path following-keyframes-animation languages-deforming objects-morphing-3Dshape interpolation- Natural Phenomena: Plants-water- Gaseous Phenomena

UNIT V-ADVANCED ALGORITHMS (6 hours)

Kinematic Modelling- Rigid Body Simulation- Enforcing Soft and Hard Constraints- Controlling Groups of Objects- Implicit Surfaces- Modeling and Animating Articulated Figures:Reaching and Grasping- Walking- Facial Animation- Overview of Virtual Human Representation- Motion Capture

LIST OF EXPERIMENTS (30 hours)

1. Line Drawing and Line Movement
2. Circle and Ellipse drawing
3. Write a C program for 2D Transformations like Translations and Scaling and Rotations
4. Write a C program for 3D Transformations like Translations and Scaling and Rotations.
5. Logo Creation
6. Curve creation
7. Text Animation
8. Composite object creation
9. Controlling group of objects.
10. Creating Natural things like water,plants.
11. Creating Facial Animation,Walking

TEXT BOOK

1. Rick Parent, "*Computer Animation: Algorithms and Techniques"* , Morgan Kaufmann Publishers,2012

REFERENCES

1. Donald Hearn & M. Pauline Baker ,Warren Carithers, "*Computer GraphicsWith Open GL*", Pearson Education,4th Edition,2010.
2. John F. Hughes, Andries van Dam , Morgan McGuire ,David F. Sklar , James D. Foley, Steven K. Feiner, Kurt Akeley," *Computer Graphics: Principles and Practice" , Addison-Wesley Professional*, 3rd Edition, 2013.

<table>
<tr><th colspan="16">IT1116 COMPUTER ANIMATION: ALGORITHMS & TECHNIQUES</th></tr>
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NETWORKS & SECURITY

		L	T	P	C
IT 1117	**CRYPTOGRAPHY**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

As Cryptography is considered to be an vital tool in protecting information in computer based systems, this course intends to provide the learner with the need for cryptographic measures, fundamentals of cryptographic systems and algorithms, the math required for better understanding of different encryption and decryption schemes.

INSTRUCTIONAL OBJECTIVES

1.	Understand OSI security architecture and classical encryption techniques
2.	Acquire fundamental knowledge on the concepts of finite fields and number theory
3.	Understand various block cipher and stream cipher models
4.	Describe the principles of public key cryptosystems, hash functions and digital signature

UNIT I-INTRODUCTION (9 hours)

Services, Mechanisms and attacks-the OSI security architecture-Network security model-Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques, steganography)

UNIT II-FINITE FIELDS AND NUMBER THEORY (9 hours)

Groups, Rings, Fields-Modular arithmetic-Euclid's algorithm-Finite fields-Polynomial Arithmetic –Prime numbers-Fermat's and Euler's theorem-Testing for primality -The Chinese remainder theorem- Discrete logarithms.

UNIT III-BLOCK CIPHERS (9 hours)

Data Encryption Standard-Block cipher principles-block cipher modes of operation-Advanced Encryption Standard (AES)-Triple DES-Blowfish-RC5 algorithm.

UNIT IV-PUBLIC KEY CRYPTOGRAPHY (9 hours)

Principles of public key cryptosystems-The RSA algorithm-Key management -Diffie Hellman Key exchange-Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT V-HASH FUNCTIONS AND DIGITAL SIGNATURES (9 hours)

Authentication functions-Message authentication codes-Hash functions-Hash Algorithms (MD5, Secure Hash Algorithm)-Digital signatures (Authentication protocols, Digital signature standard).

TEXT BOOK

1. William Stallings, *Cryptography and Network Security*, Pearson Education, New Delhi, 6th Edition, March 2013.

REFERENCES

1. AtulKahate , *"Crptography and Network Security"*,McGraw Hill Education India Pvt Ltd, 2nd Edition, 2009
2. Charlie Kaufman, Radia Perlman, Mike Speciner, *Network security*, Prentice Hall of India, 2002.
3. Charles Pfleeger, *Security in computing*, Prentice Hall of India, 4th Edition, 2006.

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<tr><th colspan="16">IT1117 CRYPTOGRAPHY</th></tr>
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		L	T	P	C
IT 1118	**SECURE CODING PRINCIPLES**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				
	Knowledge of Programming is preferred				

PURPOSE

Commonly exploited software vulnerabilities are usually caused by avoidable software defects. Overcoming these defects during the process of development of software leads to secure coding practices. So, the purpose of this course is to identify, explain and demonstrate the problems in insecure coding practices and methods to rectify the same.

INSTRUCTIONAL OBJECTIVES

1.	Understand the need for secure coding and proactive development process
2.	Explain and demonstrate secure coding practices
3.	Learn input issues related to database and web and fundamental principles of software security engineering

UNIT I- NTRODUCTION (6 hours)

Need for secure systems- Proactive security development process- Security principles to live by and threat modeling

UNIT II-SECURE CODING IN C (6 hours)

Character strings- String manipulation errors – String Vulnerabilities and exploits – Mitigation strategies for strings- Pointers – Mitigation strategies in pointer based vulnerabilities – Buffer Overflow based vulnerabilities

UNIT III-SECURE CODING IN C++ AND JAVA (6 hours)

Dynamic memory management- Common errors in dynamic memory management- Memory managers- Double –free vulnerabilities –Integer security- Mitigation strategies

UNIT IV-DATABASE AND WEB SPECIFIC INPUT ISSUES (6 hours)

Quoting the Input – Use of stored procedures- Building SQL statements securely- XSS related attacks and remedies

UNIT V–SOFTWARE SECURITY ENGINEERING (6 hours)

Requirements engineering for secure software: Misuse and abuse cases- SQUARE process model- Software security practices and knowledge for architecture and design

LIST OF EXPERIMENTS (30 hours)

1. Buffer overflow mechanisms and rectification measure
2. Unsafe string handling functions and measures to overcome

3. Array indexing
4. Cross site scripting
5. Dynamic memory management
6. Integer security
7. Use of stored procedures and SQL statements

TEXT BOOKS

1. Michael Howard , David LeBlanc, "*Writing Secure Code*", Microsoft Press, 2nd Edition, 2003
2. Robert C.Seacord, " *Secure Coding in C and C++*", Pearson Education, 2nd edition, 2013
3. Julia H. Allen, Sean J. Barnum, Robert J. Ellison, Gary McGraw, Nancy R. Mead, " *Software Security Engineering : A guide for Project Managers*", Addison-Wesley Professional, 2008

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<tr><th colspan="16">IT1118 SECURE CODING PRINCIPLES</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="14">Department of Information Technology</td></tr>
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<tr><td>5</td><td>Approval</td><td colspan="14">23rd meeting of Academic Council, May 2013</td></tr>
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		L	T	P	C
IT1119	**NETWORK SECURITY**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				
	Knowledge of Computer Networks and Cryptography is preferred				

PURPOSE

The proliferation of Internet and networked computer systems has made organizations vulnerable to security threats and attacks. In order to practice, mitigation of security risks and secure computer based systems, this course provides a comprehensive view of the network security principles and measures to prevent vulnerabilities and security attacks in the networks.

INSTRUCTIONAL OBJECTIVES

1.	Understand and Demonstrate the basic concepts of networks, networking devices and various attacks possible on networking devices
2.	Understand the concept of IP security and its architecture
3.	Understand and Demonstrate the various methods and protocols to maintain E-mail security and Web Security
4.	Learn the various methods of password management and protocols to maintain system security

UNIT I-INTRODUCTION (6 hours)

Networking Devices(Layer1,2,3)-Perimeter security devices (Firewalls,IDS and IPS)- Various attacks possible on network devices - Multilevel model of security – comparative study on Virus, Worms, Trojan and Backdoor – Legal issues.

UNIT II-IPSECURITY (6 hours)

Overview of IPSec - IP and IPv6-Authentication Header-Encapsulation Security Payload (ESP)- Internet Key Exchange (Phases of IKE, ISAKMP/IKE Encoding).

UNIT III-E-MAIL SECURITY (6 hours)

Security Services for E-mail-attacks possible through E-mail - establishing keys-privacy-authentication of the source-Message Integrity-Non-repudiation-Pretty Good Privacy-S/MIME.

UNIT IV-WEB SECURITY **(6 hours)**

SSL/TLS Basic Protocol-computing the keys- client authentication-PKI as deployed by SSLAttacks fixed in v3- Exportability-Encoding-Secure Electronic Transaction (SET)

UNIT V-SYSTEM SECURITY AND AUTHENTICATION APPLICATIONS **(6 Hours)**

DoS attacks- DDos attacks-Password Management, Kerberos , attacks possible on SAM file

LIST OF EXPERIMENTS **(30 hours)**

1. Eavesdropping attacks and protection using SSH
2. Dictionary attacks
3. VPN over WAN*
4. Firewall configurations in diverse scenarios

TEXT BOOK

1. Charlie Kaufman, Radia Perlman, Mike Speciner, "*Network Security"*, Prentice Hall of India, 2002.

REFERENCES

1. William Stallings,"*Cryptography and Network Security"*, Pearson Education,New Delhi, 4th Edition ,2005
2. Charles Pfleeger, "*Security in Computing"*, Prentice Hall of India, 4th Edition, 2006.
3. UlysessBlack, "*Internet Security Protocols"*, Pearson Education Asia, 2000

IT1119 – NETWORK SECURITY															
Course designed by		**Department of Information Technology**													
		a	b	c	d	e	f	g	h	i	j	k	l	m	N
1	Student outcome										X			X	
2	Mapping of instructional objectives with student outcome										1 3			2 4	

3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)	Professional Subjects (P)
							X
4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
		X	X				
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1120	**FORENSICS AND INCIDENT RESPONSE**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				
	Knowledge of TCP/IP is preferred				

PURPOSE

The main purpose of this course is to learn and understand the secrets and strategies for responding & recovering from computer crime incidents and to handle security breaches and hacker attacks.

INSTRUCTIONAL OBJECTIVES

1.	Describe the incident response methodology for all stages of an investigation
2.	Understand the process of performing network surveillance.
3.	Describe and contrast the various steps in investigating windows and Unix systems.
4.	Investigate web server attacks, DNS attacks and router attacks

UNIT I-INTRODUCTION TO COMPUTER FORENSIC TECHNOLOGY (6 hours)

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team.

UNIT II-INVESTIGATIVE GUIDELINES (6 hours)

Initial assessment - Checklist. Investigating the incident -Formulation of response strategy - The computer forensic process - Handling evidence - Performing forensic duplication and analysis.

UNIT III-PERFORMING NETWORK SURVEILLANCE (6 hours)

Network protocols - performing trap & trace. Network forensics - Setting up the system-Advanced network surveillance. Attackers goals - ICMP covert channeling - TCP covert channeling - HTTP. Establishing identity in cyberspace: Investigating IP address-MAC address-Tracing E-mails-E-mail address-Usernames-Nicknames and host names.

UNIT IV-INVESTIGATING SYSTEMS (6 hours)

Investigating systems-Windows NT/2000. IR UNIX systems and investigating UNIX.

UNIT V-HACKER TOOLS (6 hours)

Investigating non-platform - Specific technology. Routers -Web attacks - Application servers - Investigating hacker tools.

LIST OF EXPERIMENTS (30 hours)

1. Cyber check suite – forensic duplication of hard drive
2. True imager – image of SATA hard drives
3. Log file analysis
4. Network forensics – packet capturing and analysis
5. SIM card forensics – analyzing the contents of a SIM
6. Demonstration of cyber check sleuth kit

TEXT BOOKS

1. Kevin Mandia, Chris Prosise, *Incident Response-Investigating computer crime*, Tata McGraw Hill, 2001
2. MarjieT.Britz, *Computer Forensics and Cyber Crime*, Second Edition, Pearson 2012.

REFERENCES

1. Eoghan Casey, *Handbook Computer crime Investigation's Forensic tools and technology*, Academic Press, 1st Edition, 2001.
2. Norbert Zaenglein, *Disk Detective:Secret you must know to recover information from a computer*, Paladin press,2000.
3. John R.Vacca,Micheal Erbschloe,*Computer Forensics*, Charles River Media, Book and CD-ROM edition , 2000.

4. Tonny Summers, Brian Jenkinson and A.J.Sammers ,*Forensic computing: A Practitioners guide*, Springer Verlag, 1st Edition ,2000.
5. Peter Stephenson, *Investigating computer crime: A Handbook for corporate investigations*,Sept 1999.

IT1120 FORENSICS AND INCIDENT RESPONSE															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
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3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
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4	Broad area (for 'P'category)	Programming			Networking		Data base		Web System		Human Computer Interaction		Platform Technologies		
		X			X										
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1121	**BIOMETRICS**	**3**	**0**	**0**	**3**
	Total contact hours – 45				
	Prerequisite				

	Nil				

PURPOSE

The use of biometrics to provide security for different kinds of systems has become a common practice. Hence, there arises a need for a security professionals to become knowledgeable in the area of biometric systems, technologies, standards and applications. So the design of this course will serve the aforementioned need.

INSTRUCTIONAL OBJECTIVES

1.	Learn Biometrics, biometric matching, and the benefits of biometric security
2.	Understand various Biometrics technologies, standards, and its day to day applications
3.	Learn how Biometrics is used for network security

UNIT I-INTRODUCTION (9 hours)

Introduction - Benefits of biometric security - Verification and identification - Basic working of biometric matching - Accuracy - False match rate - False non-match rate - Failure to enroll rate - Derived metrics.

UNIT II-BIOMETRIC TECHNOLOGIES (9 hours)

Fingerbiometric technologies- Face biometric technologies- Voice biometric technologies-Iris biometric technologies-otherpsysiologicalmetrics- Hand scan - Retina scan - AFIS (Automatic Finger Print Identification Systems)- Behavioral Biometrics-Signature scan- keystroke scan.

UNIT III-BIOMETRICS FOR NETWORK SECURITY (9 hours)

Implementing biometrics for network security- the choice of a biometric for network access- biometrics and privacy.

UNIT IV-PRIVACY AND STANDARDS IN BIOMETRIC SYSTEM DESIGN (9 Hours)

Assessing the privacy risks in biometrics- Bioprivacy-designing privacy sympathetic biometric systems- biometric standards

UNIT V- BIOMETRIC APPLICATION (9 hours)

Categorizing biometric applications- customer – citizen facing applications- employee facing applications -biometric vertical markets- the future of biometric authentication

TEXT BOOKS

1. Samir Nanavati, MichealThieme, Raj Nanavati, "*Biometrics – Identity Verification in a Networked World***"**, 1 st edition, Wiley, 2002.
2. Paul Reid, "*Biometrics for Network Security***"**, 1 stedition, Prentice Hall,

2004.

REFERENCES

1. John D. Woodward, Jr, Nicholas M.Orlans, Peter T.Higgins,"*Biometrics the Ultimate Reference***"**, DreamTech press, 2009.
2. James Wayman, Anil Jain, DavideMaltoni, Dario Maio "*Biometric Systems – Technology, Design and Performance Evaluation***"**, Springer, 2005

<table>
<tr><th colspan="16">IT1121 BIOMETRICS</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="14">Department of Information Technology</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>n</td></tr>
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		L	T	P	C
IT1122	**WIRELESS AND MOBILE COMMUNICATION**	**3**	**0**	**0**	**3**

	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE	
This course focuses on the basic concepts, various standards and protocol and security issues of various layers in wireless and mobile communication systems.	
INSTRUCTIONAL OBJECTIVES	
1.	Understand the cellular system concepts and system design.
2.	Learn various standards of wireless and mobile telecommunication systems.
3.	Understand different protocols of mobile network, transport and application layers.

UNIT I-THE CELLULAR CONCEPT: SYSTEM DESIGN FUNDAMENTALS (9 hours)

Evolution of Mobile Radio Communications- Introduction- Frequency Reuse- Channel
Assignment Strategies- Handoff Strategies- Interference and System Capacity- Trunking And
Grade Of Service- Improving Capacity In Cellular Systems-FDMA- TDMA- Spread Spectrum- Multiple Access: Space Division Multiple Access-Packet Radio.

UNIT II-WIRELESS NETWORKS (9 hours)

Wireless LAN-IEEE802.11 standards-Architecture-Services-WiFi-Mobile Adhoc Networks-Wireless Local Loop.

UNIT III-MOBILE COMMUNICATION SYSTEMS (9 hours)

GSM- DECT- TETRA- UMTS and IMT-2000.

UNIT IV-MOBILE NETWORK AND TRANSPORT LAYER (9 hours)

Mobile IP- Dynamic host configuration protocol- Traditional TCP- Classical TCP- TCP over 2.5/3G wireless networks.

UNIT V-MOBILE APPLICATION LAYER (9 hours)

WAP model- WAP Gateway- WAP Protocols- WML Script- i-mode- SynCML.

TEXT BOOK

1. Theodore. S. Rappaport, *'Wireless Communications-Principles and Practice'*, Prentice Hall, 2nd Edition 2002.

REFERENCES

1. Jochen. H. Schiller, *'Mobile communication'*, Addison- Wesley, 2nd Edition2003.
2. William Stallings, *'Wireless Communication and Networks'*, , Pearson Prentice Hall, 2nd Edition ,2005.

IT1122 WIRELESS AND MOBILE COMMUNICATION															
Course designed by		**Department of Information Technology**													
1	Student outcome	A	b	c	d	e	f	g	h	i	j	k	l	m	n
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2	Mapping of instructional objectives with student outcome												**1 2**	**3**	
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming			Net working			Data base		Web System	Human Computer Interaction		Platform Technologies		
					X										
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1123	**NETWORK DESIGN AND MANAGEMENT**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Knowledge of Computer Networks, TCP/IP is must				

PURPOSE	
This course provides an idea to design network and technologies used to design network like LAN and WAN. It also provides the foundation for network management and security issues.	
INSTRUCTIONAL OBJECTIVES	
1.	Understand the Fundamental Design Principles of network.
2.	Learn the technologies and topologies used in LAN and WAN
3.	Understand the different network management strategies and various security issues while designing a network

UNIT I-PRINCIPLES OF NETWORK DESIGN (9 hours)

Objectives – Understanding the Networking Environment - Achieving the Design Goals – Predictability - Fundamental Design Principles. **Designing the LAN:** Campus network design goals – understanding the campus network – Designing a LAN topology – Importance of Layer 3 Switching – Campus hierarchical design: Access Layers – Intermediate Layer – Campus Backbone.

UNIT II Designing the Wide Area Network (WAN) (9 hours)

Designing the WAN topology – Flat Versus Hierarchical – Flat WAN Topology - Limitations of Flat WAN Design. Hierarchical WAN: Frame Relay - PVC and Leased Line Aggregation – Broadcast Control in WAN – Disaster Recovery – Issues with Hierarchical Design –Hierarchical Layers – WAN design Parameters.

UNIT III - CHOOSING WAN TECHNOLOGY (9 hours)

Design consideration for Serial Links – ISDN Design Issues with IP – Designing IP over ATM.

Fundamental IP Routing Design: Designing an IP Addressing Plan – Categorizing IP Routing Protocols – Choosing Routing Protocols – Routing Information Protocols.

UNIT IV-NETWORK MANAGEMENT (9 hours)

Network Management Architecture – Basic network management functions – LAN Element Management – Network Management Protocols – LAN Operations Management – Network Planning and Simulation Tools.

UNIT V-NETWORK SECURITY MANAGEMENT (9 Hours)

Basic network Security Issues – Security Policies – Cryptography – Firewalls – Access Control Methods – Public key Infrastructure - IP Security – Security Issues in Virtual Private Network – Security Issues in VoIP.

TEXT BOOK

1. Cormac Long, "*IP Network Design*", TATA McGraw Hill Publishing Company, 6th Reprint 2005.

REFERENCES

1. Gerd Keiser, "*Local Area Networks*", TATA McGraw Hill Education Private Limited, 11th Reprint 2009.
2. Farrel, " *Network Management, Know it all*", Elsevier, 2009.
3. William Stallings, "*Cryptography and Network Security*", Pearson Higher Education, 4th Edition, 2010.

IT1123 NETWORK DESIGN AND MANAGEMENT															
Course designed by		**Department of Information Technology**													
1	Student outcome	A	b	c	d	e	f	g	h	i	j	k	l	m	n
				X						**X**					
2	Mapping of instructional objectives with student outcome			**1** **2** **3**						**3**					

3	Category	General (G)	Basic Sciences (B)		Engineering Sciences and Technical Arts (E)	Professional Subjects (P)	
						X	
4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
			X				
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1124	**MULTILAYER SWITCHING**	2	0	2	3
	Total contact hours - 60				
	Prerequisite				
	Knowledge of Computer Networks is preferred				

PURPOSE

This Course aims to provide theoretical and practical knowledge equivalent to Cisco Certified Network Professional. Course also addresses the design and deployment strategies of switching world and also gives an overview of Voice over IP Networks and its dependencies on Quality of service related issues.

INSTRUCTIONAL OBJECTIVES

1.	Understand and work with layer 2 and layer 3 switching devices.
2.	Learn and understand the difference between the existing PSTN and VOIP Networks.
3.	Know the necessity of QOS while handling different types of Network traffic.

UNIT I-INTELLIGENT INFORMATION NETWORKS (6 hours)

SONA Architecture – L2 Switching/ L3 Routing / Multilayer Switching – VLAN-VLAN Trunking Protocol – VTP Pruning - Inter VLAN Routing-Redundant Topologies – STP and its Implementation - STP Enhancements(MSTP,RSTP).

UNIT II-LAYER 2 HIGH AVAILABILITY AND SECURITY (6 hours)

High Availability–HSRP, VRRP, GLBP- Switch Security Issues: Port Security, VLAN Hopping, DHCP Snooping, Loop Guard, UDLD, VLAN ACL, Private VLANs and Protected Ports.

UNIT III-INTRODUCTION TO VOICEOVERIP (6 hours)

Benefits and Components of VOIP Network- Digitizing and Packetizing Voice – Digital Voice Encoding- Voice Codec Characteristics – Encapsulating voice packets for transport – Bandwidth Requirements of VOIP- Real-Time Concerns; RTP/RTCP; H.323 and SIP as signalling protocols.

UNIT IV-INTRODUCTION TO QOS (6 hours)

Congestion and Queuing- Queuing Algorithms- Converged Network Quality Issues – Different Types of Delay –Traffic policing and Shaping Implementing QOS – Traffic Classification- 3 QOS Models – DiffServ QOS Model and Its Implementation – Trust Boundaries.

UNIT V-MULTIPROTOCOL LABEL SWITCHING (6 hours)

WAN Topologies- Standard IP based Switching - CEF based Multi-Layer switching-MPLS Characteristics- Frame Mode MPLS Operation and configuration-wireless security (WEP-WPA-WPA2-802.1x).

LIST OF EXPERIMENTS (30 hours)

1. Static VLANS, VLAN Trunking, and VTP Domains and Modes
2. Configuring Ether Channel.
3. Spanning Tree Protocol (STP) Default Behaviour
4. Modifying Default Spanning Tree Behaviour
5. Per-VLAN Spanning Tree Behaviour
6. Multiple Spanning Tree
7. Inter-VLAN Routing with an External Router
8. Securing VLANs with Private VLANs, RACLs, and VACLs

TEXT BOOKS

1. Richard Froom, Erum Frahim & Balaji Sivasubramanian *Implementing Cisco IP Switched Networks (SWITCH)*- ISBN-10:1587058847 ISBN-13:9781587058844
2. Luc De Ghein , *MPLS Fundamentals*, 1st Ed,2006, Cisco Press[ISBN: 978-1-58705-197-5]

REFERENCES

1. Jeremy Cioara, Michael J. Cavanaugh *CCNA Voice Official Exam Certification Guide (640-460 IIUC)*, 1st Edition, Publication Date: November 17, 2008 | ISBN-10: 1587202077 | ISBN-13: 978-1587202070
2. Amir Ranjbar 2007, *CCNP ONT Exam Certification Guide*, Cisco Press [ISBN: 978-1-58720-176-3]
3. *CCNP SWITCH 6.0 – Student Lab Manual*

<table>
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		L	T	P	C
IT1125	**NETWORK SIMULATION AND MODELLING**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Knowledge of Computer Networks is preferred				

PURPOSE

The purpose of the course on Network Simulation and Modeling is to use modeling and simulation to solve real-life problems. The course also provides a comprehensive exposition of the core concepts in modeling and simulation, and addresses practical considerations in modeling complex large-scale systems.

INSTRUCTIONAL OBJECTIVES

1.	Learn the tools and strategies to build simulation models from the scratch
2.	Understand Monte carlo simulations and CASiNO simulation framework
3.	Understand the core concepts of systems simulation and modeling

UNIT I–BASIC CONCEPTS AND TECHNIQUES (9 hours)

Why is Simulation Important? - What Is a Model? - Performance Evaluation Techniques - Development of Systems Simulation - **Designing and Implementing a Discrete-Event Simulation Framework:** The Scheduler- The Simulation Entities-The Events- Hello World- Two-Node Hello Protocol-Two-Node Hello through a Link.

UNIT II-HONEYPOT COMMUNITIES AND MONTE CARLO SIMULATION (9 hours)

System Architecture-Simulation Modeling- Simulation Execution- Output Analysis – Characteristics of Monte Carlo Simulations- Monte Carlo Algorithm- Merits and drawbacks.

UNIT III–NETWORK MODELING (9 hours)

Simulation of Networks- The Network Modeling and Simulation Process- Developing Models- Network Simulation Packages – Case Study: OPNET Simulator

UNIT IV-CASINO: A NETWORK SIMULATION FRAMEWORK (9 hours)

Conduits- Visitors- The conduit repository- Behaviors and Actors- Making a poisson source of packets- Making a protocol for packet processing- Bounding protocol resources – Dynamically instantiating protocols

UNIT V-MODELING NETWORK TRAFFIC (9 hours)

Network traffic models – Models for wireless traffic – Global optimization techniques – Particle swarm optimization- Input modeling and output analysis

TEXT BOOKS

1. Mohsen Guizani, AmmarRayes, Bilal Khan, Ala Al-Fuqaha , " *Network Modeling and Simulation : A Practical Perspective*", Wiley Publishers,ISBN: 978-0-470-03587-0, 2010
2. Ricardo F.. Garzia, Mario R. Garzia, " *Network Modelling, simulation and analysis*", Marcel Dekker Inc., 1990

REFERENCE

1. Wehrle, Klaus; Günes, Mesut; Gross, James (Eds.), "*Modeling and Tools for Network Simulation*", Springer Publications, 2010

IT1125 NETWORK SIMULATION AND MODELLING															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
										X					
2	Mapping of instru ctional									**1 2**					

	objectives with student outcome									**3**					
3	Category	General (G)			Basic Sciences (B)			Engin eering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Progra mming			Netwo rking			Data base		Web System	Human Comput er Interacti on			Plat form Techn ologies	
					X									X	
5	Approval	23rd meeting of Academic Council, May 2013													

PROGRAMMING AND WEB SYSTEMS

		L	T	P	C
IT1126	**INTERACTIVE WEB PAGE SCRIPTING**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Knowledge of Web systems and Technology is preferred				

PURPOSE

The purpose of this course is to design and develop an interactive and dynamic website with database connectivity.

INSTRUCTIONAL OBJECTIVES

1.	Understand basic principles of website design and user interface design.
2.	Understand and create web page using client side and server side scripting
3	Understand web site dynamic behavior
4	Understand database connectivity using ASP .net
5.	Generate dynamic web pages using JSON and PHP scripting languages

UNITI-PRINCIPLES OF WEBSITE DESIGN and USABILITY **(9 hours)**

Design process and evaluation-Accessibility-Page layout-text appearance-links-writing web content-content management

UNIT II-CLIENT SIDE SCRIPTING (9 hours)

Advanced JavaScript: Interacting with Images- windows and frames-External Javascript- Javascript cookies-Objects and entities – browser and feature detection- Keyboard and printer interaction- regular expression – **Java FX Applets:**develop and deploy javafx applets and applications

UNIT III-SERVER SIDE SCRIPTING (9 hours)

JSP:JSP overview- JSTL- embedding JSP code in HTML- creating dynamic web pages using JSP-**PHP:**PHP overview- syntax- advanced functions-embedding PHP scripts inside web pages

UNIT IV-ADVANCED SCRIPTING LANGUAGES (9 hours)

JSON: An alternative to xml technology- overview and concepts of JSON-how to implement JSON in web sites-**Python:** Python Fundamentals

UNIT V-DATABASE CONNECTION –ASP (9 hours)

Introduction- Relational Database-SQL-MYSQL-Microsoft Language Integrate Query –LINQ to SQL –Querying a Database using LINQ-Dynamically binding LINQ to SQL -**ASP:** ASP objects-program for database connection using ASP and MYSQL

TEXT BOOKS

1. Paul J. Deitel, Harvey Deitel, Abbey Deitel , *Internet and World Wide Web How to Program* , , 5th Edition, 2011 ,ISBN 0132151006, 9780132151009
2. Timothy A Budd , *Exploring Python*, Oregon State, ISBN: 0073523372, 2011

REFERENCES

1. Michael O. Leavitt, Ben Shneiderman ,*Web Design & Usability Guidelines*
2. www.W3Schools.org
3. http://www.javascriptkit.com/javatutors/
4. http://www.dieajax.com
5. http://www.w3resource.com/JSON/introduction.php

IT1126 INTERACTIVE WEB PAGE SCRIPTING															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
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2	Mapping of instructional objectives with student outcome									3 5	4	1 2			
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4	Broad area (for 'P' category)	Programming			Networking			Data base		Web System	Human Computer Interaction			Platform Technologies	
										X					
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1127	**PROGRAMMING MULTIMEDIA FOR**	**3**	**0**	**0**	**3**

	THE WEB				
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE	
To enable the students with the necessary skills which motivate them to program for the web based multimedia applications.	
INSTRUCTIONAL OBJECTIVES	
1.	To understand the basics of event based programming using Adobe Flash
2.	To understand the concepts of vector animation using action scripting in Adobe flash together with XML capabilities to render rich content in the browser.
3.	To comprehend the basic programming models and standards of Flex by which applications can be deployed consistently on all major browsers, desktops, and devices.
4.	To grasp the skills necessary to design rich forms that apply the use of data binding and validation.
5.	To understand the Adobe Integrated Runtime (AIR) for building Rich Internet applications (RIA).

UNIT I-INTRODUCTION TO ACTION SCRIPT IN FLASH (9 hours)

Programming Concepts – Variables, Data types, Conditionals, Loops, Arrays, Functions, Custom objects - Properties, Methods and Events – Display List, Timeline Control.

UNIT II-ADVANCED CONCEPTS IN ACTION SCRIPTING USING FLASH (9 hours)

OOP –Motion –Drawing with Vectors and Pixels –Text –Understanding XML

UNIT III FLEX BASICS (9 hours)

Setting up the environment –Using Design mode and Source mode –Basics of Scripting –Adding Interactivity with Action Script

UNIT IV-DATA BINDING AND VALIDATION (9 hours)

Using Data Binding –Laying Out the Application –Creating Rich Forms – Gathering and Displaying Data

UNIT V-ADOBE AIR (9 hours)

Introduction – Applications, Windows, Menus –File System Integration – Using Local databases –HTML in AIR.

TEXT BOOKS

1. Rich Shupe and Zevan Rosser, "*Learning ActionScript 3.0: A Beginner's Guide*", Adobe Developer Library.
2. ChaficKazoun and Joey Lott, "*Programming Flex 3*", Adobe Developer Library.
3. Michael Labriola, "*Breaking out of Web Browser with Adobe AIR*", Prentice Hall, Inc., 2009.

REFERENCES

1. Joseph Lott, Kathryn Rotondo, Sam Ahn and Ashley Atkins, "*Adobe AIR in Action*", Manning Publications Co, 2009

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		L	T	P	C
IT1128	**ADVANCED WEB APPLICATION DEVELOPMENT**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				
	Knowledge of Web systems and Technology is preferred				

PURPOSE

Advanced Internet-scale systems and applications are geographically distributed, highly available, incrementally scalable, and dynamically configurable. This course reviews concepts, techniques; frameworks involved in such advanced Internet application development and explore the different components (like databases, web services, scripting etc.) that are used to compose such applications.

INSTRUCTIONAL OBJECTIVES

1.	Generate web page using AJAX, JQUERY and JSP
2.	Understand web site dynamic behavior and server side programming
3.	Understanding persistence Data storage in Android
4.	Generate dynamic web pages using databases.
5.	Develop web services and comprehend the significance of frameworks

UNIT I-HTML5 and AJAX (6 hours)

Introduction – Rich Internet Applications.HTML 5 –Responsive web design HTML and CSS Frameworks. Introduction to Javascript-Objects and Events-Basic AJAX-History of AJAX – AJAX using XMLHttpRequest object- using XML and DOM – creating a full scaled AJAX Enabled Application using JSON. DoJo Frameworks, Yahoo UI.

UNIT II-JQUERY (6 hours)

JQuery basic-jquery core-events-effects-plugins-user interface using jQuery UI –Advanced Topics: code organization-advanced event handling, effects and DOM manipulations.

UNIT III-JSP and SERVLETS (6 hours)

Overview of JSP2.2 and Servlet 3.1- creating dynamic web pages using JSP-Standard Tag Library- Database Access- XML Data - Java Beans - Custom Tags - Expression Language –Annotations- Filters-Event handling-Exception Handling - Asynchronous processing -Debugging - Security – Internationalization.

UNIT IV-DATABASE CONNECTIVITY (6 hours)

Introduction- Relational Database-SQL-MYSQL-JBDC-Driver and Connection Management –Connection and Pooled connection-Resultset-Datatype support-Statements, Prepared statement, Callable statements Microsoft Language Integrate Query –LINQ to SQL –Querying a Database using LINQ- Dynamically binding LINQ to SQL – Understanding JDBC ODBC connectivity.

UNIT V-WEB SERVERS and WEB FRAMEWORKS (6 hours)

Web servers: Introduction – HTTP/HTTPS Transactions – Multi tier Application architecture –Configuring web servers –Apache installation – Microsoft IIS Express and web matrix- Web Frame works. MVC Struts, Java Server Faces (JSF) POJO–WebSevices : WSDL-UDDI-SOAP-RPC and RESTFull web services. Introduction to Ruby on Rails

LIST OF EXPERIMENTS (30 hours)

1. Programs on HTML 5,CSS 3.0 based boiler plate and twitter bootstap template
2. Programs on AJAX,Validatations connecting to serverside programs
3. Programs on jQuery DOM manipulations,Events, Animation and effects
4. Programs on JSP 2.2 and Servlet 3.1 for creating Dynamic web pages
5. Programs on java JDBC data base connectivity
6. Programs on 3 tier application using JSP and JDBC data base connectivity with MySQL
7. Programs on MVC using Struts 2.0
8. Programs on MVC JSF 2.0
9. Programs on .Java based Web Services using SOAP protocol.
   An MVC Web project to be implemented to get incisive knowledge on WEB application development

TEXT BOOKS

1. Paul J. Deitel, Harvey Deitel, Abbey Deitel , *Internet and World Wide Web How to Program* ,5th Edition, 2011 ,ISBN 0132151006, 9780132151009
2. Jonathan Chaffer, Karl Swedberg *Learning jQuery*, 3rd Edition ,2011, ISBN 13 : 9781849516549

REFERENCES

1. Rebecca," *jQuery Fundamentals"*, Murphey, 2010

2. www.W3Schools.org
3. http://www.tutorialspoint.com/jsp/

IT1128 ADVANCED WEB APPLICATION DEVELOPMENT																
Course designed by		**Department of Information Technology**														
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n	
										X	X		X			
2	Mapping of instructional objectives with student outcome									1 2 4	3		5			
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)				Professional Subjects (P)				
												X				
4	Broad area (for 'P'category)	Programming			Networking		Data base		Web System			Human Computer Interaction		Platform Technologies		
		X							X							
5	Approval	23rd meeting of Academic Council, May 2013														

		L	T	P	C
IT1129	**ADVANCED JAVA PROGRAMMING**	**2**	**0**	**2**	**3**
	Total conduct hours - 60				

	Prerequisite				
	Knowledge of Programming in Java and Integrative Programming and Technology is preferred				

PURPOSE	
Having a hands on core java programming concepts, this course reviews advanced concepts in programming that motivate the students to build innovative cutting-edge applications. This course explores the skills required to develop J2EE enterprise applications using the Java programming language.	
INSTRUCTIONAL OBJECTIVES	
1.	Design interactive applications with user interface
2.	Make effective use of Java networking API to communicate between processes using network sockets
3.	Develop database applications using JDBC
4.	Designing Java Sever Pages
5.	Understand Reflection API & XMLprocessing as it pertains to Java

UNIT I–JAVA GUI PROGRAMMING (6 hours)

Basics of Swings - Swing Components- Containers and Frames- Layout Manager- Menus and Toolbars- Event Handling

UNIT II-CUSTOM NETWORKING (6 hours)

URL: Creating and Parsing URL – URLConnection : Connecting to a URL - Reading from and Writing to a URLConnection. **Socket:** ServerSocket/Socket class – InetAddress. **Datagrams:** Writing a datagram client and server : DatagramSocket, DatagramPacket – Broadcasting to multiple recipients – MulticastSocket-SSL and HTTPS in Java

UNIT III-DATABASE ACCESS (MYSQL) (6 hours)

Database Architecture : Components of JDBC – Two Tier/ Three Tier Architecture Processing SQL Statements: Establish Connection : [Using DriverManager class, Connection URLs] – create a statement – Execute Query – Process ResultSet **Handling SQL Exceptions :** Contents of SQLException object , Retrieving warnings using SQLWarning object. **Reading from and modifying values in a ResultSet :** Types – Concurrency – Read column values from rows – Updating rows in a resultset **Prepared Statements :** Creating PreparedStatement object – Assign values for PreparedStatement parameters.

UNIT IV-JSP AND SERVLETS (6 hours)

Overview of JSP2.2 and Servlet 3.1- creating dynamic webpages using JSP-Standard Tag Library- Database Access- XML Data - Java Beans - Custom Tags - Expression Language –Annotations- Filters-Event handling-Exception Handling -Asynchronous processing -Debugging - Security – Internationalization

UNIT V-REFLEXTION API & JAVA XML (6 hours)

Introduction to Java Reflextions API - Interospection –Dynamic Proxies-Dynamic class loading and reloading. Java XML: XML Processing - SAX & DOM parsers.

LIST OF EXPERIMENTS (30 hours)

1. Programs on Swing basic components with containers and frames
2. Programs on Swing menu bars and tool bars
3. Programs on TCP and UDP Socket
4. Programs on InetAddress and URLConnection
5. Programs on JDBC data base connectivity and normal execution of queries
6. Programs on ResultSet iteration and Prepared Statements
7. Programs on designing pages using JSP
8. Programs on Reflection and Dynamic Proxies
9. Programs on .parsing XML using JAXP API

TEXT BOOKS

1. Andrea Steelman & Joel Murach "*Murach's Java Servlets and JSP*", published by Prentice Hall,2003, 2nd Edition
2. Cay S. Horstmann; Gary Cornell, "*Core Java™ Volume II–Advanced Features*", published by Prentice Hall, 2008, Eighth Edition

REFERENCES

1. Marty Hall and Larry Brown "*Core Servlets and JavaServer Pages*", published by Prentice Hall,2004, Second Edition Volume 1.
2. Arthur Griffith "*Java, XML, and the JAXP*" published by john wiley & sons, Inc, 2002.
3. http://docs.oracle.com/javase/tutorial/

IT1129 ADVANCED JAVA PROGRAMMING																
Course designed by		**Department of Information Technology**														
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n	
										X	X	X				
2	Mapping of instructional objectives with student outcome									1 2 5	3	4				
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)					
											X					
4	Broad area (for 'P'category)	Programming			Networking		Data base		Web System		Human Computer Interaction			Platform Technologies		
		X														
5	Approval	23rd meeting of Academic Council, May 2013														

		L	T	P	C
IT1130	**MOBILE APPLICATION DEVELOPMENT**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				
	Knowledge of JAVA Programming is				

	preferred				

PURPOSE	
The course harnesses the skills of students in developing mobile application development using the Android platform.	
INSTRUCTIONAL OBJECTIVES	
1.	Understanding Mobile Application development features and trends
2.	Understand the basics of Android devices and Platform.
3	Impart knowledge on basic building blocks of Android programming Activities, Services, Broadcast Receivers and Content providers
4	Understanding persistence Data storage in Android
5.	Understanding Advanced application concepts like networking, cloud interface and Google Maps services etc.
6.	Enable Students to develop and publish Android applications in to Android Market

UNIT I-INTRODUCTION (6 hours)

Introduction to mobile application development, trends, introduction to various platforms, introduction to smart phones, introduction to development environment/IDE, Android platform features and architecture, versions, android market.

Android development setup – Eclipse, ADT, android sdk, tools. Android application anatomy, emulator setup, application framework basics- ,resources-layout, values, asset XML representation and generated R.Java file ,Android manifest file. Creating a simple application.

UNIT II–ACTIVITIES (8 hours)

Introduction to activities, activities life-cycle, User Interface

Intent – intent object, intent filters – adding categories, linking activities, user interface design components-Fragments, basic views, list views, picker views ,adapter views, Menu ,Action Bar etc, layouts, basics of screen design, registering listeners and different event Listeners. Creating application using multiple activities.,UI views with different layouts.

UNIT III–DATA PERSISTENCE (4 hours)

Shared preferences, File Handling, Managing data using SQLite database **Content providers** – user content provider, android provided content providers. Creating a simple examples using content provider and persisting data into database.

UNIT IV–BACK GROUND RUNNING PROCESS, NETWORKING

AND TELEPHONY SERVICES **(6 hours)**

Services - introduction to services – local service, remote service and binding the service, the communication between service and activity, Handlers, MultiThreading and Async Task. Android network programming- Telephony services- SMS and telephony applications.

Broadcast Receivers–Introduction to receivers, pending intent, Notification.

UNIT 5–ADVANCED APPLICATIONS **(6 hours)**

Location based services-Google maps services using Google API, Overview on Tweened animations, Property animations- android media. Google App engine and connecting Android apps-Cloud Storage. Android application development guidelines,-publishing android applications.

LIST OF EXPERIMENTS **(30 hours)**

1. Programs on Understanding Activity Life Cycle and Intents
2. Programs on Basic UI Layout using XML
3. Programs on Basic Views, Composite Views and adapter Views
4. Programs on Fragments ,Menus and Action bar
5. Programs on Data persistence using Shared Preference and Flat File handling
6. Programs on SQLite Database programming
7. Programs on Service (Music Player and Clock service)
8. Programs on Android networking (Http connection based)
9. Programs on GPS and Google Maps for Location based services
10. Programs on .Cloud connection in Android (SkyDrive / Googe Drive),Google App engine
11. An Android project to be implemented to get incisive knowledge on android App development

TEXT BOOK

1. Wei-Meng Lee, *Beginning Android 4 Application Development Wrox Publications 2012*

REFERENCES

1. Paul Deital and Harvey Deital *Android How to Program,*Detial associates 2013
2. ZigurdMednieks, Laird Dornin, G. Blake Meike, Masumi Nakamura ***Programming Android*** *Java Programming for the New Generation of Mobile Devices* O'Reilly Media Released: July 2011

3. http://developer.android.com

IT1130 MOBILE APPLICATION DEVELOPMENT															
Course designed by		Department of Information Technology													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
										X	X	X			
2	Mapping of instructional objectives with student outcome									1 2 3 4	5	6			
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming			Net working			Data base	Web System		Human Computer Interaction		Platform Technologies		
													X		
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1131	**VISUAL PROGRAMMING**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				
	Nil				

PURPOSE

To provide a focused, hands-on environment to experience the new features and functionality related to building Data Components in Microsoft Visual Studio and to cover the major topics for Windows and web application on the .NET Framework.

INSTRUCTIONAL OBJECTIVES

1.	Understand the goals and objectives of .Net framework
2.	Impart knowledge on basic concepts of C#
3.	Develop programs for windows applications, delegates and Events Generics
4.	Develop database application using connected and disconnected model
5.	Design web application using ASP .Net

UNIT I-INTRODUCTION TO .NET FRAMEWORK (5 hours)

Introduction to .NET : Overview of the .NET Framework - Common Language Runtime -
Framework Class Library - Understanding the C# Compiler- .NET Assembly: - classification of assembly-creating and using managed DLLs – Private and shared assembly – The Global Assembly Cache

UNIT II-C# FUNDAMENTALS (8 hours)

Basics of C#: Working with Variables - Making Decisions. Classes and Objects: Methods – Properties - Interface- Partial class- Null and Casting As-Handling Exceptions-Namespaces.

UNIT III-WINDOWS APPLICATIONS (5 hours)

Windows and Dialogs: MDI – Dialogs. Lists: List Box - Tree view control - Menus and Toolbars - Delegates and Events Generics.

UNIT IV-DATA ACCESS WITH .NET (6 hours)

Data Access With .Net: ADO.NET overview - Commands - Data Reader - XML Schemas - Populating a dataset. .Net Programming with SQL Server: Reading and writing streamed XML - converting ADO.Net to XML data.

UNIT V-PROGRAMMING FOR THE INTERNET (6 hours)

ASP.NET Web Forms and Controls: Web Forms Controls - Data Binding and Data Source Controls - Validation Controls - Master and Content pages. The Asp.Net Application Environment: Configuration Files - ASP.NET Application Security - Caching.

LIST OF EXPERIMENTS (30 hours)

1. Program to add and remove an Assembly from Global Assembly Cache.
2. Program to implement console applications using
   - Properties.
   - Inheritance

- Interface.
- 'Ref' and 'Out' keyword.
- Partial Class.
- Exception Handling.

3. Program to implement Event and Delegates
4. Program to implement windows applications using
   - MDI
   - Dialogs.
   - Windows controls.
5. Program to access database with ADO.NET
6. Program to implement
   - Reading and Writing XML files
   - XML validation.
   - Database Table to XML and XML to Table Conversion
7. Program to implement Data binding controls.
8. Program to implement ASP.Net Validation controls
9. Program to implement Master and content pages.
10. Program to design a Web page using ASP.net

TEXT BOOKS

1. Stephen C. Perry,' *Core C# and .NET'*, Prentice Hall, New Jersey, 2005
2. Matthew MacDonald ,*'Beginning ASP.NET 4.5 in C#* ',Apress,2012

REFERENCES

1. Karli Watson, Christian Nagel, Jacob Hammer Pedersen, Jon D. Reid, Morgan Skinner, '*Beginning Visual C#* 2010',Wiley 2010
2. Adam Freeman ,*'Introducing Visual C# 2010'*, Apress.
3. Herbert Schildt ,*'C# 4.0 The Complete Reference'*, McGraw – Hill companies,2010 www.programmersheaven.com
4. www.questpond.com

IT1131 VISUAL PROGRAMMING															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
											X	X	X		
2	Mapping of instructional objectives with										2 5	3 4	1		

	student outcome														
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming			Networking			Database			Web System	Human Computer Interaction		Platform Technologies	
												X			
5	Approval	23rd meeting of Academic Council, May 2013													

		L	T	P	C
IT1132	**CLOUD APPLICATION DEVELOPMENT**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				
	Nil				

PURPOSE

Cloud computing offers new ways of developing and deploying software applications over the internet. This course reviews the techniques of developing web applications considering the application and infrastructure architecture of cloud. The course also provides hands on the techniques in deploying the application in the Cloud environment.

INSTRUCTIONAL OBJECTIVES

1.	Distinguish traditional and cloud based development.
2.	Understanding the concept of cloud application/infrastructure architectures.
3.	Develop web pages using latest technologies.
4.	Appreciate the significance of using frameworks in web application development
5.	Deploy a web application in cloud.

UNIT I-CLOUD BASED APPLICATIONS (6 hours)

Introduction, Contrast traditional software development and development for the cloud. Public v private cloud apps. Understanding Cloud ecosystems what is SaaS/PaaS, popular APIs, mobile.

UNIT II-CLOUD APPLICATION ARCHITECTURES (6 hours)

Grid computing-Transactional computing; **Cloud Infrastructure Models:** Platform as a service vendor-Infrastructure as a service- Class and Method design to make best use of the Cloud infrastructure.

UNIT III-WEB BROWSERS AND THE PRESENTATION LAYER (6 hours)

Understanding Web browsers attributes and differences. Building blocks of the presentation layer: HTML, HTML5, CSS, Silverlight, and Flash.

UNIT IV-WEB DEVELOPMENT TECHNIQUES AND FRAMEWORKS (6 hours)

Building Ajax controls, Introduction to Javascript using JQuery, working with JSON, XML, REST. Application development Frameworks e.g. Ruby on Rails , .Net, Java API's or JSF.

UNIT V-DEPLOYMENT ENVIRONMENTS (6 hours)

Platform As A Service (PAAS) **,**Amazon, vmForce, Google App Engine, Azure, Heroku, AppForce.

LIST OF EXPERIMENTS (30 hours)

1. Programs on HTML 5,CSS 3.0 based boiler plate and twitter bootstap template
2. Programs on jQuery DOM manipulations,Events, Animation and effects
3. Programs using JSON representation of objects.
4. Programs on REST webservices using SOAP/HTTP.
5. Programs on Ruby on Rails, using controllers and form in/out from/to user
6. Programs on .Java based Web Services using SOAP protocol

TEXT BOOK

1. George Reese 2009, *Cloud application architectures*, O'Reilly Sebastopol, CA [ISBN: 978-0596156367]

REFERENCES

1. Paul J. Deitel, Harvey M. Deitel 2008, *Ajax, rich Internet applications, and web development for programmers*, Prentice
2. Chris Hay, Brian Prince, *Azure in Action* [ISBN: 978-1935182481]
3. Henry Li, *Introducing Windows Azure* [ISBN: 978-1-4302-2469-3]

4. Eugenio Pace, Dominic Betts, Scott Densmore, Ryan Dunn, Masashi Narumoto, MatiasWoloski, *Developing Applications for the Cloud on the Microsoft Windows Azure Platform* [ISBN: 9780735656062]
5. Eugene Ciurana, *Developing with Google App Engine* [ISBN: 978-1430218319]
6. Charles Severance, *Using Google App Engine* [ISBN: 978-0596800697]
7. Dan Sanderson, *Programming Google App Engine* [ISBN: 978-0596522728]

IT1132 CLOUD APPLICATION DEVELOPMENT															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
										X			X	X	
2	Mapping of instructional objectives with student outcome									1 2 3			4 5	2	
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)				
											X				
4	Broad area (for 'P'category)	Programming			Networking			Data base		Web System	Human Computer Interaction			Platform Technologies	
														X	
5	Approval	23rd meeting of Academic Council, May 2013													

		L	**T**	**P**	**C**
IT1140	**PYTHON PROGRAMMING**	**2**	**0**	**2**	**3**
	Total contact hours - 60				
	Prerequisite				

	Nil				

PURPOSE	
Python has evolved into a more popular and powerful open source programming tool. The purpose of this course is to introduce Python, a remarkably powerful dynamic programming language, to write code for a variety of application domains.	
INSTRUCTIONAL OBJECTIVES	
1.	Able to setup Python working environment
2.	Understand the object oriented features of Python
3.	Able to confidently use Python to develop Network and Web applications
4.	Learn to use Tkinter to develop GUI applications

UNIT I-GETTING STARTED WITH PYTHON (2 hours)

Introduction to python – Installation - Python Interpreter – Interpreter and its environment

UNIT II-LANGUAGE AND ITS BUILT-INS (6 hours)

The Python Language - Object Oriented Python - Exceptions - Modules – Core Built-Ins - String and Regular Expression – Levels of Abstraction – Software Development Process.

UNIT III-LIBRARIES AND MODULES (8 hours)

Files and Text Operations – Persistant and Databases – Time Operations – Controlling Executions - Threads and Processing – Numeric Processing – Testing, Debugging and Optimizing .

UNIT IV–NETWORK AND WEB PROGRAMMING (8 hours)

Client side Network Protocol Modules – Socket and Server side Network Protocol Modules – CGI Scripting and Alternatives – MIME and Network Encodings

UNIT V-EXTENDING AND EMBEDDING (6 hours)

Extending and Embedding Classic Python – Extending and Embedding Jython – Distributing Extensions and Programs – Tkinter GUI Programming.

LIST OF EXPERIMENTS (30 hours)

1. Write a Python program for implementing classes with minimum of two functions.
2. Write a python program involving the usage of dictionaries

3. Write a Python program mentioning the usage of lists and Tuples
4. Write a Python program for creating a Simple Server connecting to a simple client.
5. Write a Python program to create a simple web application.
6. Write a Python program for File handling operations along with error handling.
7. Create a Simple GUI application using TKinter library in Python
8. Write a python program involving the concepts of Threads
9. Write a simple program implementing java inside python (Jython)
10. Write a Python program for Online Ticket reservation system using Mysqldayabase in background.

TEXT BOOK

1. Timothy A. Budd *'Exploring Python'* – TATA McGRAW-HILL Edition - 2011

REFERENCES

1. Guido Van Rossum, Fred . L. Drake *'Introduction to Python'* – Network Theory Limited – March 2011
2. Alex Martelli *'Python in a Nutshell'* - O'Reilly - 2nd Edition, 2006

IT1140 PYTHON PROGRAMMING															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
				X						X					
2	Mapping of instructional objectives with student outcome			1 2						3					
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)				Professional Subjects (P)					
										X					
4	Broad area (for P'category)	Programming		Networking		Database		Web System		Human Computer Interaction		Platform Technologies			

		X					
5	Approval						

SOFTWARE /HARDWARE SYSTEMS

		L	T	P	C
IT1133	**DATA COMPRESSION**	**3**	**0**	**0**	**3**
	Total contact hours – 45				
	Prerequisite				
	Knowledge in Principles of Communication Systems is preferred				

PURPOSE

Compression methods are otherwise known as algorithms, which are calculations that are used to compress files. Organizations that create file formats create their own algorithms and compete with each other to create the best format. The purpose of this course is to provide the students with the skills required to learn and create compression techniques and algorithms.

INSTRUCTIONAL OBJECTIVES

1.	Get a brief introduction to data compression techniques.
2.	Understand more about Huffman coding and arithmetic coding.
3.	Discuss about Image, video, audio and text compression method.

UNIT I–INTRODUCTION (9 hours)

Introduction to data compression. Compression techniques: lossless compression -lossy compression- measures of performance –Modelling and coding- Basic techniques-statistical methods: Shannon- Fano coding.

UNIT II - HUFFMAN CODING AND ARITHMETIC CODING

(9 hours)

Huffman coding algorithm: optimality Huffman codes- length of Huffman codes- extended Huffman codes. Adaptive Huffman coding: Adaptive coding-Huffman tree-Huffman code-encoding the symbol-decoding the symbol – Comparison of Huffman &arithmetic coding. IMAGE COMPRESSION-Image transforms – JPEG-progressive image compression- DPCM- Hilbert scan and VQ- cell encoding.

UNIT III-VIDEO ANDAUDIO COMPRESSION (9 hours)

Digital video- video compression- MPEG-MPEG-4 - sound-digital audio- Human Auditory Systems-ADPCM Audio compression.

UNIT IV-QUANTIZATION AND ENCODING (9 hours)

Scalar quantization -adaptive quantization ,non uniform quantization – Vector quantization: structured vector quantizers –Differential encoding – adaptive DPCM-Delta modulation-speech coding-image coding - Mathematical preliminaries for lossless compression.

UNIT V-COMPRESSION METHODS (9 hours)

Symbol ranking- Sparse strings- word based text compression- textual image compression- dynamic Markov coding- FHM curve compression.

TEXT BOOK

1. David Salomon, "*Data compression, the complete reference"*, 3rd edition, SpringerInternationalEdition,2007.

REFERENCES

1. Mark nelson, "*The data compression book"*, BPB publications, 2nd edition,1995.
2. Khalid sayood, *Introduction to data compression*, Academic Press, 3rd edition,2005.

IT1133 DATA COMPRESSION

Course designed by		Department of Information Technology													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
		x								**x**	**x**				
2	Mapping of instructional objectives with student outcome	**1** **2** **3**								**1** **3**	**2** **3**				

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)	Professional Subjects (P)
					X

4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
				X			
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1134	**PARALLEL PROGRAMMING USING OPENCL**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Knowledge in Computer Architecture and Organization, **Data Structures and Algorithm are preferred**				

PURPOSE

The purpose is to understand how to implement parallelizable algorithm using OpenCL under heterogeneous computing.

INSTRUCTIONAL OBJECTIVES

1.	Get the knowledge of parallel programming and computing.
2.	Analysis of the performance of algorithms that is parallelizable.
3.	Implementation of algorithms in OpenCL.
4.	Demonstrate some real time applications using OpenCL.

UNIT I-PARALLEL PROGRAMMING BASICS (9 hours)

ILP – DLP – TLP – Synchronization- Thinking Parallel- Concurrency and parallel programming- Structure.

UNIT II-INTRODUCTION TO OPENCL (9 hours)

OpenCL SDK kit-Platform and Devices- Execution Environment- Memory model- Writing kernel- Matrix Multiplication example.

UNIT III-OPENCL DEVICE ARCHITECTURE (9 hours)

Super scalar execution - SIMD and Vector Processing- Muti-core CPU- GPU Architecture- APU.

UNIT IV-OPENCL CONCURRENCY (9 hours)

Creating workgroups- Queuing synchronization – Global Synchronization- Host side Memory model- Device side memory model.

UNIT V- OPENCL CASE STUDY (9 hours)

Introduction- Getting video frames- Processing video in OpenCL- Multiple videos with special effects- Display to screen of final Output.

TEXT BOOKS

1. Benedict R. Gaster, Lee, *Howes, "Heterogeneous computing with Open CL"*.
2. *Introduction to OpenCL Programming*, Training Guide, May 2010.

REFERENCES

1. D. Kirk and W. Hwu, "*Programming Massively Parallel Processors*", Morgan Kaufmann,
2. David A. Patterson and John L. Hennessy, "*Computer Organization and Design: The Hardware/Software Interface"*, Elsevier.

IT1134 PARALLEL PROGRAMMING USING OPENCL	
Course designed by	**Department of Information Technology**

1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
		X		X											
2	Mapping of instructional objectives with student outcome	1 3		2 4											

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)		Professional Subjects (P)	
						X	
4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
							X
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1135	**SOFTWARE TESTING**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Knowledge in Software Engineering is preferred				

PURPOSE

The purpose is to understand the methodologies and tradeoffs involved in software testing.

INSTRUCTIONAL OBJECTIVES

1.	Understand the basics of testing, debugging and errors.
2.	Learn various methodologies of testing.
3.	Give knowledge of Test Management.
4.	Demonstrate the purpose of Test tool and automation.

UNIT I-INTRODUCTION (9 hours)

Testing as an Engineering Activity – Role of Process in Software Quality – Testing as a Process – Basic Definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support for Developing a Defect Repository.

UNIT II-TEST CASE DESIGN (9 hours)

Introduction to Testing Design Strategies – The Smarter Tester – Test Case Design Strategies – Using Black Box Approach to Test Case Design Random Testing –Requirements based testing – positive and negative testing -–– Boundary Value Analysis – decision tables - Equivalence Class Partitioning state-based testing– cause effect graphing – error guessing - compatibility testing – user documentation testing –Domain testing Using White–Box Approach to Test design – Test Adequacy Criteria –Static testing vs. structural testing – code functional testing - Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White–box Based Test Design – code complexity testing – Evaluating Test Adequacy Criteria.

UNIT III-LEVELS OF TESTING (9 hours)

The Need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests. The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – scenario testing –defect bash elimination -System Testing – types of system testing - Acceptance testing – performance testing - Regression Testing – internationalization testing – ad-hoc testing - Alpha – Beta Tests – testing OO systems – usability and accessibility testing.

UNIT IV-TEST MANAGEMENT (9 hours)

People and organizational issues in testing – organization structures for testing teams –testing services - Test Planning – Test Plan Components – Test Plan Attachments –Locating Test Items – test management – test process - Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

UNIT V-CONTROLLING AND MONITORING (9 hours)

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation- Test metrics and measurements –project, progress and productivity metrics – Status Meetings – Reports and Control Issues – Criteria for Test Completion – SCM – Types of reviews – Developing a review program – Components of Review Plans– Reporting

Review Results. – evaluating software quality – defect prevention – testing maturity model.

TEXT BOOKS

1. Sandeep Desai, AbhishekSrivastava, "*Software Testing: a Practical Approach",* PHI Learning Pvt. Ltd, 2012.
2. SrinivasanDesikan and Gopalaswamy Ramesh, " *Software Testing – Principles and Practices*", Pearson education, 2006.

REFERENCES

1. AdityaP.Mathur, "*Foundations of Software Testing",* Pearson Education,2008.
2. Boris Beizer, "*Software Testing Techniques*", Second Edition,Dream tech, 2003
3. Elfriede Dustin, "*Effective Software Testing*", First Edition, Pearson Education, 2003.
4. RenuRajani, Pradeep Oak, "*Software Testing – Effective Methods, Tools andTechniques",* Tata McGraw Hill, 2004.

<table>
<tr><th colspan="16">IT1135 SOFTWARE TESTING</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="14">Department of Information Technology</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>n</td></tr>
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5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1136	**PARALLEL ARCHITECTURE & ALGORITHMS**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Knowledge in Computer Architecture and Organization is preferred				

PURPOSE

The purpose is to understand the methodologies and tradeoffs involved in designing a shared memory parallel computer.

INSTRUCTIONAL OBJECTIVES

1.	Give the knowledge of parallel and super computers.
2.	Analysis of static and dynamic scheduling.
3.	Implementation of hardware based speculation algorithm.
4.	Demonstrate the purpose of virtual memory and caches.

UNIT I-INTRODUCTION (9 hours)

Instruction Set- Measuring Performance -Implementation of MIPS- Pipelining Basics- Hazards.

UNIT II-EXPLOITING ILP (9 hours)

Software scheduling- Loop Unrolling- Loop Transformation- Dynamic Scheduling- Hardware Based speculation- Branch Prediction

UNIT III-MULTITHREADING & MULTIPROCESSORS (9 hours)

Introduction to parallel programming- Single Thread Execution – TLP – Multithreading – SMT – Multiprocessors – SIMD – MIMD- Challenges in parallel processing.

UNIT IV-MEMORY TECHNOLOGIES (9 hours)

Centralized and Distributed Shared memory- Symmetric shared memory architecture- Cache coherence- Snooping protocol- Memory consistency.

UNIT V-MEMORY HIERARCHY AND SYSTEM STORAGE (9 hours)

Memory hierarchy design- Eleven optimization of cache- Protection of processes- Virtual system monitors- System storage- levels of RAID.

TEXT BOOKS

1. David A. Patterson and John L. Hennessy, *"Computer Organization and Design: The Hardware/Software Interface*", Elsevier.

2. D. E. Culler and J. P. Singh with A. Gupta, *"Parallel Computer Architecture*", Morgan- Kaufmann publishers.

REFERENCES

1. Behrooz Parhami, *"Introduction to Parallel Processing: Algorithms and Architectures*", Springer.
2. Christian Bischof, *"Parallel Computing**:** Architectures, Algorithms, and Applications"*, IOS press.

<table>
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	y)						X
5	Approval	23rd meeting of Academic Council, May 2013					

		L	T	P	C
IT1137	**GENETIC ALGORITHMS**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

The purpose of this course is to give a complete understanding of the concepts of Genetic Algorithms.

INSTRUCTIONAL OBJECTIVES

1.	Get a brief introduction to Mathematical Foundations.
2.	Understand more about applications of Genetic Algorithms.
3.	Understand about Genetics Based Machine Learning.

UNIT I-INTRODUCTION TO GENETIC ALGORITHMS AND MATHEMATICAL FOUNDATION (9 hours)

Introduction to Genetic Algorithms-Traditional Optimization and search methods – GA vs. Traditional Methods – Simple GA – Schemata –Learning the Lingo. Schema Processing –Mathematical Foundations-The Fundamental Theorem- The 2-armed and K-armed Bandit problem – Building block hypothesis– Minimal deceptive problem.

UNIT II-GA OPERATORS (9 hours)

Data Structures-Reproduction-Roulette-Wheel Selection-Boltzman Selection-Tournament Selection-Rank Selection-Steady State Selection-Crossover Mutation-A time to reproduce, a time to cross-Get with the Main Program-How well does it work– Mapping Objective Functions in fitness form – Fitness Scaling – Codings – A Multiparameter, mapped, Fixed point coding – Discretization –Constraints.

UNIT III-GA ADVANCED OPERATORS AND TECHNIQUES

(9 hours)

Dominance – Diploidy – Abeyance – Inversion and Reordering operators – Other micro operators – Niche and Speciation – Multi objective optimization – Knowledge based techniques – GA and parallel processors.

UNIT IV-INTRODUCTION TO GENETIC BASED MACHINE LEARNING **(9 hours)**

Genetic based machine learning – Classifier system – Rule and message system – The bucket brigade – Genetic algorithm – A simple classifier system

UNIT V-APPLICATIONS OF GENETICS BASED MACHINE LEARNING **(9 hours)**

Rise of GBML –Development of CS1, the first classifier system -Smith's Poker player – Other early GBML Efforts – A Potpourri of current applications.

TEXT BOOKS

1. David E. Gold Berg, *"Genetic Algorithms in Search, Optimization & Machine Learning",* Pearson Education, 2001.
2. Melanie Mitchell, "*An Introduction to Genetic Algorithms*", The MIT Press, 1998.

REFERENCES

1. S. Rajasekaran, G.A. VijayalakshmiPai, "*Neural Networks, Fuzzy Logic and Genetic Algorithms"*, PHI, 2003. (Chapters 8 and 9)
2. Kalyanmoy Deb, "*Optimization for Engineering Design, algorithms and examples",* PHI, 1995

IT1137 GENETIC ALGORITHMS															
Course designed by		**Department of Information Technology**													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
		x								**x**			**x**		
2	Mapping of instructional objectives with student outcome	**1**								**2**			**3**		

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)		Professional Subjects (P)	
						x	
4	Broad area (for 'P'category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
		x					
7	Approval	23rd meeting of Academic Council, May 2013					

Course Code	Course Title	L	T	P	C
IT1138	**INTERNET OF THINGS**	**3**	**0**	**0**	**3**
	Total conduct hours – 45				
	Prerequisite				
	Basic knowledge of computer architecture, programming and communication protocols				

PURPOSE

Embedded Systems are devices meant for performing dedicated jobs with constrained resources. We are surrounded by million such devices. Internet of Things (IoT) is a technological need to interconnect all such devices, things with us anytime, anywhere, anytime. This course attempts to address the paradigm shift technologies, standards and tools needed to achieve the interoperability.

INSTRUCTIONAL OBJECTIVES

1.	Understand the basics of Embedded System, IoT and the development model
2.	Understand the architecture, Instruction set and work on an 8-bit microcontroller using simulation and real-time.
3.	Ability to select appropriate hardware and microcontrollers based on need of application
4.	Understand the Internet of Things Standards, Frameworks and

	Techniques
5.	Apply the tools, techniques and skills acquired towards development of Projects.

UNIT I INTRODUCTION TO EMBEDDED SYSTEMS AND INTERNET OF THINGS (IOT)

(9 hours)

Architecture of Embedded Systems- Embedded Systems Development process- Architecture of Internet of Things- Applications of Embedded Systems and IoT-Challenges in designing an Embedded System

UNIT II - 8051 ARCHITECTURE AND PROGRAMMING

(9 hours)

Architecture- Instruction set- Programming ports, Timer/Counter, Serial communication, Interrupts in C

UNIT III - OVERVIEW OF OPEN SOURCE HARDWARE AND ITS RELEVANCE TO IOT

(9 hours)

Introduction and Programming Arduino- Introduction and Programming Galileo-Introduction and Programming Raspberry Pi –Introduction and Programming Spark core- Introduction and Programming Intel Edison-Comparison, analysis and relevance of above Hardware to IoT.

UNIT IV - IOT: TECHNOLOGIES, STANDARDS AND TOOLS

(9 hours)

Fundamental characteristics and high level requirements of IoT- IoT Reference model-IoT ecosystem and Business models- Introduction to Protocols of IoT: D2D, D2S, S2S- Comparison between MQTT, CoAP, LWM2M, ETSI M2M- Introduction to simulation tools.

UNIT V CASE STUDIES AND APPLICATION DEVELOPMENT FOR IOT USING EMBEDDED SYSTEMS (9 hours)

Smart cities-Smart environment-Smart Water- Smart metering- Security and emergencies-Smart agriculture-Techniques for writing Embedded code - Examples for Application development for IoT.

TEXT BOOKS

1. "Embedded Real Time Systems: Concepts, Design and Programming" by Dr.K.V.K.K.Prasad, DreamTech Publication, 2003.
2. "The 8051 Microcontroller and Embedded Systems: Using Assembly and C" 2/e by Muhammad Ali Mazidi, Janice Gillispie Mazidi and Rolin McKinlay, Pearson Education, 2011.
3. "Designing the Internet of Things" by Adrian McEwen, Hakim Cassimally, Wiley Publications, 2012
4. "The Internet of Things: Key applications and Protocols" Wiley Publications 2nd Edition

REFERENCES

1. http://www.itu.int/en/ITU-T/gsi/iot/Pages/default.aspx
2. http://electronicdesign.com/embedded/understanding-protocols-behind-internet-things
3. http://eclipse.org/community/eclipse_newsletter/2014/february/article2.php
4. http://iot.eclipse.org/protocols.html
5. http://www.slideshare.net/paolopat/internet-ofthingsprotocolswar
6. http://www.slideshare.net/RealTimeInnovations/io-34485340
7. http://www.networkworld.com/article/2456421/internet-of-things/a-guide-to-the-confusing-internet-of-things-standards-world.html
8. http://internetofthings.electronicsforu.com/
9. http://www.embedded.com/electronics-news/4410270/Thingsquare-opens-up-source-code-for-its-IoT-Mist
10. http://www.cio.com/article/2843814/developer/how-to-develop-applications-for-the-internet-of-things.html
11. http://www.cio.com/article/2602467/consumer-technology/10-hot-internet-of-things-startups.html

12. http://www.cio.com/article/2376254/internet/an-internet-of-things-prediction-for-2025----with-caveats.html
13. http://www.thingsquare.com/blog/articles/what-the-system-does/

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<tr><td colspan="15">IT1138 INTERNET OF THINGS</td></tr>
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<tr><td>5</td><td>Approval</td><td colspan="13">29th meeting of Academic Council, May 2015</td></tr>
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		L	T	P	C
IT1139	**PERVASIVE COMPUTING**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Knowledge in Computer Networks and Internet Programming is Preferred				

PURPOSE

This course aims is to introduce the characteristics, basic concepts and systems issues in pervasive computing, and to provide an opportunity for students to understand the emerging technologies and issues in a pervasive computing system.

INSTRUCTIONAL OBJECTIVES

1.	Discover the characteristics and understand the technologies used at three basic stages of achieving pervasive computing namely microelectronics, communication and standardization.
2.	Analyze the strengths and limitations of the tools and devices for development of pervasive computing systems.
3.	Understand the basic back-end infrastructure and investigate the basic technologies for designing the pervasive computing system
4.	Understand the pervasive web application architecture and develop an attitude to propose a solution for any given requirement.

UNIT I-INTRODUCTION TO PERVASIVE COMPUTING (9 hours)

Definition – Past, Present and Future – Application - Device Technology – Device Connectivity - Challenges in Pervasive Computing: Hardware and

Networks – Software: Java - Operating Systems - Client Middleware – Security.

UNIT II-PERVASIVE COMPUTING DEVICE CHARACTERISTICS (9 hours)

Mobile Computing device characteristics: Adaptation – Data dissemination and Management – Heterogeneity – Interoperability – Context awareness – Language localization issues – User Interface design issues – Difference between UI design for mobile devices and conventional systems – Mobile Agents – Mobile Device technology overview – Windows CE – Symbian – J2ME – Pocket PC – BREW.

UNIT III-CONNECTING TO THE WORLD (9 hours)

Internet Protocols and Formats – Mobile Internet – Voice – Web Services – Connectivity – Service Discovery.

UNIT IV-BACK END SERVER INFRASTRUCTURE (9 hours)

Gateways – Application Servers – Internet Portals – Device Management – Synchronization.

UNIT V-PERVASIVE WEB APPLICATION ARCHITECTURE

(9 hours)

Introduction to Server-Side Programming in Java – Pervasive Web Application Architecture – Example Application.

TEXT BOOKS

1. JochenBurkhardt, Horst Henn, Stefan Hepper, Thomas Schaec& Klaus Rindtorff. "*Pervasive Computing Technology and Architecture of Mobile Internet Applications*",Pearson Education, 6th edition, 2009
2. Dan Chalmers, University of Susex, Brighton, "*Sensing and systems in pervasive computing*", Springer, 2011

REFERENCES

1. Hansmann, LotharMerk, Martin Niclous, Stober, "*Principles Of Mobile Computing*", Springer, 2nd Ed, Dream Tech Press, New Delhi
2. F.Adelstein, S.K.S. Gupta, "*Fundamentals of Mobile and Pervasive Computing*", Tata McGraw Hill, 2005.
3. AshokeTalukdar and RoopaYavagal, "*Mobile Computing*", Tata McGraw Hill, 2005.

IT1139 PERVASIVE COMPUTING

Course designed by		Department of Information Technology													
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
		X								X	X	X			
2	Mapping of instructional objectives with student outcome	1								2	3	4			
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)				Professional Subjects (P)					
										X					
4	Broad area (for 'P'category)	Programming		Networking		Data base		Web System		Human Computer Interaction			Platform Technologies		
													X		
5	Approval	23rd meeting of Academic Council, May 2013													

Course code	Course Title	L	T	P	C
IT1141	**MACHINE LEARNING**	**3**	**0**	**0**	**3**
	Total contact hours - 45				
	Prerequisite				
	Nil				

PURPOSE

Machine Learning is the study of computer algorithms that improve automatically through experience. Applications range from data mining programs that discover general rules in large data sets, to information filtering systems that automatically learn users' interests.

INSTRUCTIONAL OBJECTIVES

1.	Understanding a very broad collection of machine learning algorithms and problems.
2.	To learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory.

UNIT I - INTRODUCTION (9 hours)

Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces and Candidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.

UNIT II - NEURAL NETWORKS AND GENETIC ALGORITHMS (9 hours)

Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evalution and Learning.

UNIT III - BAYESIAN AND COMPUTATIONAL LEARNING (9 hours)

Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.

UNIT IV - INSTANT BASED LEARNING (9 hours)

K- Nearest Neighbour Learning – Locally weighted Regression – Radial Bases Functions – Case Based Learning.

UNIT V - ADVANCED LEARNING (9 hours)

Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning

REFERENCES:

1. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar, "Foundations of Machine Learning (Adaptive Computation and Machine Learning Series)", MIT Press, 2012.
2. Tom M. Mitchell, "Machine Learning", McGraw-Hill, 1 edition, 1997.

3. Ethem Alpaydin, “Introduction to Machine Learning (Adaptive Computation and Machine Learning)”, The MIT Press, 2004.
4. T. Hastie, R. Tibshirani, J. H. Friedman, “The Elements of Statistical Learning”, Springer; 1 edition, 2001.

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<tr><td>5</td><td>Approval</td><td colspan="13">29th meeting of Academic Council, May 2015</td></tr>
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Course code	Course Title	L	T	P	C
IT1142	FUNDAMENTALS OF VIRTUALIZATION	2	0	2	3
	Total contact hours – 60				

	Prerequisite				
	Good knowledge about System Architecture and Operating Systems				

PURPOSE	
Virtualization is changing almost every aspect of how we manage systems, storage, networks, security, operating systems, and applications. The main objective is to introduce the basic concepts of virtualization to the students.	
INSTRUCTIONAL OBJECTIVES	
1.	Discuss Virtualization, hypervisors and Tools
2.	Implement and study Working of VM
3.	Research Types and benefits of Virtualization
4.	Identify And Analyze Server Virtualization
5.	Evaluate Securityissues related to Virtualization.

UNIT – I CLASSIC DATA CENTER (6 hours)

Core Elements of CDC-Application,DBMS,Compute,Storage,Network. Storage Networking Technologies- Compute to compute technology, Compute to storage technology(DAS,NAS,SAN,.FCoE, Object based Storage, Unified Storage. Backup and Recovery. CDC Management. Virtualization and Cloud Computing

UNIT II –COMPUTEVIRTUALIZATION - (6 hours)

Drivers for Virtualization, Types of Hypervisors, Benefits of Virtualization. Virtualization techniques, VM-Files, hardware and Console, Resource Management & resource pool, Physical to Virtual Conversion. Intel-v and AMD-v.

UNIT III –STORAGEVIRTUALIZATION - (6 hours)

Storage Virtualization and its Benefits, Storage for Virtual Machines, Network-Based Storage Virtualization, Virtual Provisioning and its Benefits.

UNIT IV – VIRTUALIZATION – DESKTOP AND APPLICATION (6 hours)

Drivers and Benefits of Desktop Virtualization, Desktop Virtualization Techniques, Remote Desktop Services, VDI- Components, User Profile Virtualization.Application Virtualization.

UNIT V –NETWORK VIRTUALIZATION- (6 hours)

Network Virtualization and its Benefits, Infrastructure and its components in Network Virtualization, VLAN and VSAN. Key Network Traffic Management Techniques. Future of Virtualization

Lab Experiments (30 hours)

1) Return of Investment(ROI) Calculation
2) Installing Windows as Virtual Machine
3) Installing Linux as Virtual Machine
4) Modifying Virtual Network Editor
5) Implementing Multi-Homed Systems in a Virtual Machine
6) Creating and Managing Shared Virtual Machines
7) Comparative Study of Virtual Machine Software Packages
8) Introduction to ESX Server and Performance Monitoring
9) OWN Cloud Implementation

Text Books and Links :

1. Virtualization Essentials by Matthew PortnoyISBN: 978-1118176719
2. Tim Mather, SubraKumaraswamy, ShahedLatif, “Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance” O'Reilly Media; 1 edition [ISBN: 0596802765], 2009.
3. Ronald L. Krutz, Russell Dean Vines, “Cloud Security” [ISBN: 0470589876], 2010.
4. http://www.geeks-hub.com/types-of-server-virtualization/

IT1024B FUNDAMENTALS OF VIRTUALIZATION															
Course designed by		Department of Information Technology													
1	Student	a	b	c	d	e	f	g	h	i	j	k	l	m	n

	outcome									X			X		
2	Mapping of instructional objectives with student outcome									3			1 2		

3	Category	General (G)	Basic Sciences (B)	Engineering Sciences and Technical Arts (E)	Professional Subjects (P)
					X

4	Broad area (for 'P' category)	Programming	Networking	Data base	Web System	Human Computer Interaction	Platform Technologies
							X
5	Approval	29th meeting of Academic Council, May 2015					