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PERIYAR MANIAMMAI INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University)
Established Under Sec. 3 of UGC Act, 1956 • NAAC Accredited
think • innovate • transform

FACULTY OF COMPUTING SCIENCES AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

Bachelor of Computer Applications (B.C.A)

BCA CURRICULUM AND SYLLABUS
(SEMESTER: I, II, III, IV, V and VI)

BATCH : 2018-2021

REGULATIONS 2018

University Vision and Mission

Vision

To be a University of global dynamism with excellence in knowledge and innovation ensuring social responsibility for creating an egalitarian society.

Mission

UM1: Offering well balanced programmes with scholarly faculty and state-of-art facilities to impart high level of knowledge.

UM2: Providing student - centered education and foster their growth in critical thinking, creativity, entrepreneurship, problem solving and collaborative work.

UM3: Involving progressive and meaningful research with concern for sustainable development.

UM4: Enabling the students to acquire the skills for global competencies.

UM5: Inculcating Universal values, Self respect, Gender equality, Dignity and Ethics.

Vision and Mission

Vision

To be a leading, contemporary, innovative Computer Science and Applications department in inculcating professional competencies in the field of Computing and related interdisciplinary technologies to achieve academic excellence and to facilitate research activities as a timely response to dynamic needs and challenges of industry and society.

Mission

DM1: Imparting quality education in the field of Computing Sciences and Applications and generate successful computing professional

DM2: Encouraging students to collaborate with industry environment and analyze the real world problems culminating in efficient solutions.

DM3: Transforming students into computing professionals and entrepreneurs by imparting quality training and hands on experience with latest tools and technologies.

DM4: Promoting activities in creating applications in emerging areas of computing technologies and applications in order to serve the needs of research, industry, society and scientific community.

DM5:Inculcatingvalue based and ethical commitment for bringing out successful professionals.

Mapping of University Vision and Department Mission

	DM1	DM2	DM3	DM4	DM5	**Total**
UM1	3	1	1	1	1	**7**
UM2	1	2	3	2	0	**8**
UM3	0	1	2	3	2	**8**
UM4	1	1	3	3	0	**8**
UM5	1	1	0	1	3	**6**

0-No relation 3- High relation 2- Medium relation 1– Low relation

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO1	The graduate will apply fundamental concepts of mathematics and computing technologies in the emerging application areas.
PEO2	The graduate will be able to understand the requirement of computing problem and implement an effective solution.
PEO3	The graduate will be able to practice professional ethics, management and team communication in the industrial and societal environment.
PEO4	The graduate will equip themselves to pursue higher studies, entrepreneurship, and apply new ideas and technologies in the evolving field.

Mapping of Mission (MS) with Program Educational Objectives (PEOs)

	DM1	**DM2**	**DM3**	**DM4**	**DM5**
PEO1	3	2	2	1	0
PEO2	2	3	2	2	1
PEO3	2	2	3	1	3
PEO4	2	1	3	2	1
Total	**9**	**8**	**10**	**6**	**5**

0-No relation 3- High relation 2- Medium relation 1– Low relation

Graduate Attribute (GA)

1.	Disciplinary Knowledge
2.	Problem analysis
3.	Design/Development of solutions
4.	Modern tool usage
5.	Environment and Sustainability
6.	Ethics and Social Responsibility
7.	Effective Communication
8.	Individual and Team Work
9.	Life-long learning

PROGRAMME OUTCOME AND PROGRAMME SPECIFIC OUTCOME

Programme Outcomes (POs) - BCA

PO1	To apply fundamental knowledge of mathematics and Principles of Computing techniques to solve the problems in computer science and application areas.
PO2	To analyse a computing requirement and apply programming principles for providing effective solutions.
PO3	To design an innovative interface method to bring the complete requirement and visualize the result for decision making.
PO4	To investigate and apply modern tools and technologies in the construction of software system.
PO5	To practice team communication, effective management and Interpersonal skill for the successful computing professional and entrepreneur.
PO6	To apply contextual knowledge of professional, ethical, legal, and security to assess societal, health, legal and cultural issues.
PO7	To extend enthusiasm for self-improvement through continuous professional development and life-long learning.

Programme Specific Outcomes (PSO)- BCA

PSO1	Maintaining the system, applications, Software and network components in a computing environment
PSO2	Developing dynamic website and web enabled applications.

GA and PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	Total
GA1	3	1	0	0	0	0	0	2	1	**7**
GA2	0	3	1	0	0	0	0	3	2	**9**
GA3	0	0	3	0	0	0	0	2	2	**7**
GA4	1	1	0	3	0	0	0	2	2	**9**
GA5	0	0	1	0	0	0	0	1	1	**3**
GA6	0	2	0	0	0	2	0	0	0	**4**
GA7	0	1	0	0	2	0	0	2	2	**7**
GA8	0	1	1	0	3	0	0	2	2	**9**
GA9	1	0	0	1	0	0	3	2	2	**9**

Mapping of Program Educational Objectives (PEOs) with Program Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	Total
PEO 1	3	2	1	1	0	0	1	2	2	12
PEO 2	1	2	1	1	0	0	1	2	2	10
PEO 3	0	0	0	0	1	3	1	1	2	08
PEO 4	0	0	1	1	2	0	2	2	2	10
Total	4	4	3	3	3	3	5	7	8	

0-No relation 3- High relation 2- Medium relation 1– Low relation

BACHELOR OF COMPUTER APPLICATIONS (BCA)

REGULATIONS 2018

CURICULLUM

SEMESTER – I

Category	Course Code	Course Title	Credits				Hours				
			L	**T**	**P**	**Total**	**L**	**T**	**P**	**SS**	**Total**
AECC 1	XGL101	Communication Skills in English	2	0	0	2	2	0	0	2	4
LANG	XGL102A / XGL102B	Ariviyal Tamil / Comprehensive English	3	0	0	3	3	0	0	0	3
CC- 1	XCA103	C Programming	4	0	1	5	4	0	2	0	6
CC- 2 (DSC - 1)	XCA104	Algebra, Calculus and Analytical Geometry	4	1	0	5	4	1	0	0	5
CC- 3	XCA105	Computer Organization and Architecture	3	2	0	5	3	2	0	0	5
UMAN 1	XUM106	Human Ethics, Values , Rights and Gender Equality	3	0	0	0	3	0	0	0	3
		Total	**19**	**03**	**01**	**20**	**19**	**03**	**02**	**02**	**26**

SEMESTER – II

Category	Course Code	Course Title	Credits				Hours				
			L	**T**	**P**	**Total**	**L**	**T**	**P**	**SS**	**Total**
AEC C 2	XGL201	English for Effective Communication	2	0	0	2	2	0	0	2	4
AEC C 3	XES202	Environmental Studies	2	0	0	2	2	0	0	1	3
CC- 4	XCA203	Object Oriented Programming with C++	4	0	1	5	4	0	2	0	6
CC- 5 (DSC - 2)	XCA204	Discrete Mathematics	4	1	0	5	4	1	0	0	5
CC- 6	XCA205	Computer Networks	3	1	0	4	3	1	0	0	4
CC- 7	XCA206	Data Structures and Algorithms	4	0	1	5	4	0	2	0	6
		Total	**19**	**02**	**02**	**23**	**19**	**02**	**04**	**03**	**28**

SEMESTER – III

Category	Course Code	Course Title	Credits				Hours				
			L	**T**	**P**	**Total**	**L**	**T**	**P**	**SS**	**Total**
SEC 1	XCA301	HTML and DHTML	1	0	1	2	1	0	2	0	3
CC- 8	XCA302	Database Management Systems	4	0	1	5	4	0	2	0	6
CC- 9	XCA303	Visual Programming	4	0	1	5	4	0	2	0	6
CC-10 (DSC - 3)	XCA304	Statistical and Numerical Methods	3	2	0	5	3	2	0	0	5
GE1		*Open Elective – To be choosen by student	3	0	0	3	3	0	0	0	3
UMAN 2	XUM306	Disaster Management	3	0	0	0	3	0	0	0	3
Minor Course		Web Technology	0	0	0	1*	0	0	0	0	15
		Total	**18**	**02**	**03**	**20+1***	**18**	**02**	**06**	**00**	**26**

SEMESTER – IV

Category	Course Code	Course Title	Credits				Hours				
			L	**T**	**P**	**Total**	**L**	**T**	**P**	**SS**	**Total**
SEC 2	XCA401	Data Analytics	1	0	1	2	1	0	2	0	3
CC-11	XCA402	Java Programming	4	0	1	5	4	0	2	0	6
CC-12 (DSC - 4)	XCA403	Resource Management Techniques	3	2	0	5	3	2	0	0	5
CC-13	XCA404	Operating Systems	4	0	1	5	4	0	2	0	6
GE2		*Open Elective – To be choosen by student	3	0	0	3	3	0	0	0	3
Minor Course		Software Testing Tools and Practices	0	0	0	1*	0	0	0	0	15
		Total	**15**	**02**	**03**	**20+1***	**15**	**02**	**06**	**00**	**23**

SEMESTER – V

Category	Course Code	Course Title	Credits				Hours				
			L	**T**	**P**	**Total**	**L**	**T**	**P**	**SS**	**Total**
SEC-3	XCA501	XML and Web Services	1	0	1	2	1	0	2	0	3
DSE-1A	XCA502A	Software Engineering	4	1	0	5	4	1	0	0	5
	XCA502B	Compiler Design	4	1	0	5	4	1	0	0	5
DSE-2A	XCA503A	Unix and Shell Programming	4	0	1	5	4	0	2	0	6
	XCA503B	Web Scripting Framework	4	0	1	5	4	0	2	0	6
DSE-3A	XCA504A	Enterprise Resource Planning	4	1	0	5	4	1	0	0	5
	XCA504B	Organizational Behavior	4	1	0	5	4	1	0	0	5
GE 3		*Open Elective – To be choosen by student	3	0	0	3	3	0	0	0	3
Minor Course		Android App Development - Mobile Technology	0	0	0	1*	0	0	0	0	15
Extra credit		Inplant Training	0	0	0	2*					
		Total	**16**	**02**	**02**	**20+3***	**16**	**02**	**04**	**00**	**22**

SEMESTER – VI

Category	Course Code	Course Title	Credits				Hours				
			L	**T**	**P**	**Total**	**L**	**T**	**P**	**SS**	**Total**
SEC-4	XCA601	Introduction to Graphics Design	1	0	1	2	1	0	2	0	3
DSE-1B	XCA602A	.Net Technologies	4	0	1	5	4	0	2	0	6
	XCA602B	Programming with PHP and MySQL	4	0	1	5	4	0	2	0	6
DSE-2B	XCA603A	Mobile Computing	4	1	0	5	4	1	0	0	5
	XCA603B	Distributed Computing	4	1	0	5	4	1	0	0	5
DSE-3B	XCA604	Project Work	0	1	8	6	0	1	8	0	9
Extra credit		NCC/NSS/SPORTS/RRC//YRC	0	0	0	1*	0	0	0	0	0
		Total	**09**	**02**	**10**	**18+1***	**09**	**02**	**12**	**00**	**23**

Total Credits : 121

NOTE :

AECC – Ability **E**nhancement **C**ompulsory **C**ourse

DSE – Discipline **S**pecific **E**lective

SEC – Skill **E**nhancement **C**ourse

CC – **C**ore **C**ourse

DSC – Department **S**pecific **C**ourse

GE – Generic **E**lective

UMAN – University **MAN**datory

LANG - Language

Summary

Total Number of subjects proposed with the credits is given below:

S. No.	Type of Subject	Numbers	Total Credit
1	AECC	03	06
2	LANG	01	03
3	DSC(CC) (Theory & Lab)	13	64
4	DSE	06	31
5	SEC	04	08
6	GE	03	09
7	UMAN	02	0
8	IPT	01	02
9	NCC/NSS/SPORTS/RRC//YRC	--	01
	TOTAL	**33**	**124**

Total Credits = 121 +3(IPT & NSS/NCC/RRC) = 124 Credits

Total Credit	DSC (%)	DSE(%)	SEC(%)	AECC(%)	GE(%)	UMAN (%)	LANG	IPT & NSS/NCC/RRC(%)
124	64 (51.61%)	31 (25%)	08 (6.45%)	06 (4.84%)	09 (7.26%)	0 (0%)	03 (2.42%)	03 (2.42%)

Generic Elective I :

Subject Code	Subject Name
XCAOE1	C and C++ Programming Language
XCAOE2	Digital Imaging and Editing Techniques

Generic Elective II :

Subject Code	Subject Name
XCAOE3	Business Analytics with Worksheet
XCAOE4	Animation and Imaging

Generic Elective III :

Subject Code	Subject Name
XCAOE5	Mobile Application Development
XCAOE6	Programming in Python

Generic Elective IV :

Subject Code	Subject Name
XCAOE7	System and Network Administration
XCAOE8	PHP and MySQL

XCA103 C PROGRAMMING

Course Outcomes:

CO1	C	Knowledge	***Describe*** the concept of C programming and its fundamental
CO2	C	Understand, Apply	***illustrate*** and ***implement*** various control statementsand arrays
	P	Guided Response	***Build*** an application program using various controls statements and arrays
CO3	C	Understand,	***Differentiate***and***Implement*** structures and unions
	P	Apply	
		Guided Response	***Develop*** an application program using structures and unions
CO4	C	Understand,	***Explain*** and ***Implement*** the pointer concepts
	P	Guided	
		Response	***Develop*** an application program using structures and unions
CO5	C	Understand,	***Develop*** a program to create and process a file for different
	P	Adapt	applications

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA103	**C PROGRAMMING**	**4**	**0**	**1**	**5**
C:P:A = 4:1:0					
		L	**T**	**P**	**H**
		4	**0**	**2**	**6**

UNIT- I : INTRODUCTION TO C LANGUAGE — **12+6**

C Language - History of C - Features of C - Structure of a C Program –Pre-processors-# define- # include-Writing a C Program - Compiling and Linking a C Program - C compiler - syntax and semantic errors - link and run the C program - linker errors - logical and runtime errors - Constants, Variables and Data Types – storage – qualifiers - Operators and Expressions – Input/Output Operations – unformatted I/O - formatted I/O

Lab:
1.Program to implement formatted I/O operations
2.Program to implement unformatted I/O operations

UNIT- II : CONTROL STATEMENTS AND ARRAYS — **12+6**

Control Statements - if statement - switch statement - Loop Control Statements - while loop - do-while statement - for loop – Un-conditional Controls - goto statement - break statement - continue Statement - Arrays – multi-dimensional arrays - Character arrays and Strings – dynamic arrays

Lab:
1. Program to implement control structures
2.Program to implement one dimensional and two dimensional arrays

UNIT- III: FUNCTIONS, STRUCTURE AND UNIONS — **12+6**

Functions - User defined Functions – Call by value, Call by reference Categories of Functions – Recursion. Structures – declaration, definition- accessing the members of a structure - initializing structures - structures as function arguments - structures and arrays – Unions – dynamic memory allocation – malloc(), calloc(), realloc(), free()

Lab:

1. Program to implement calling the function through call by value method&call by reference
2. Program to implement Structures

UNIT- IV: POINTERS **12+6**

Pointers: Introduction-Understanding pointers-Accessing the address of a variable-Declaration and Initialization of pointer Variable – Accessing a variable through its pointer-Pointer Expressions – Pointers and Arrays- Pointers and Strings – Array of pointers – Pointers as Function Arguments- Functions returning pointers – Pointers to Functions – Pointers and Structures.

Lab:

1. Program to implement dynamic memory allocation
2. Program to implement pointer to function
3. Program to implement an array of pointers

UNIT- V: FILE PROCESSING **12+6**

File Management in C – Definition of Files- Opening modes of files- Standard function: fopen(), fclose(), feof(), fseek(),fewind()-fgetc(), fputc(), fscanf()-program using files

Lab:

1. Program to implement various file operations in a standard file
2. Program to implement various file operations in text file

LECTURE	TUTORIAL	PRACTICAL	TOTAL
60op\\	0	30	90

TEXT

1. E Balagurusamy: Computing Fundamentals & C Programming‖ – Tata McGraw-Hill, Second Reprint 2008, ISBN 978-0-07-066909-3.

REFERENCES

1. YashwantKanetker, Let us C, BPB Publications.
2. R. B. Patel, Fundamental of Computers and Programming in C, Khanna Book Publishing Company PVT. LTD. Delhi, India, 1st edition, 2008, ISBN: 13: 978-81-906988-7-0.
3. Gottfried, Programming with C, Tata McGraw Hill.
4. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, 2nd Ed., PHI.

E REFERENCES

1. NPTEL, Introduction to C Programming, Prof.SatyadevNandakumar ,IIT, Computer Science and Engineering Kanpur.

2. NPTEL, Introduction to Problem Solving & Programming, by Prof. Deepak Gupta Department of Computer Science and Engineering IIT Kanpur.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	2	0	0	1	0	0	1	0
CO 2	3	2	1	0	0	0	0	1	0
CO 3	3	2	0	0	0	0	1	0	0
CO 4	3	0	1	0	0	0	0	0	0
CO 5	2	0	0	1	0	0	0	0	0
Total	14	6	2	1	1	0	1	2	0
Course	3	2	1	1	1	0	1	1	0

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA 104 ALGEBRA, CALCULUS AND ANALYTICAL GEOMETRY

Course Outcome:

CO1	C	Remembering Understanding	***Explain*** and***Find*** derivative functions indifferential calculus.
CO2	C	Applying	***Solve***the definite and indefinite integrals using various techniques.
CO3	C	Applying	**Apply**orthogonal transformation todetermineeigen values and eigen vectors ofa given matrix.
CO4	C	Applying	**Solve** problems using Binomial, exponential and logarithmic seriesexpansions.
CO5	C	Remembering Applying	***Find*** the distance between two points and ***Explain***section formulae, slopeform and intercept form.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
X CA 104	**ALGEBRA, CALCULUS AND ANALYTICAL GEOMETRY**	**4**	**1**	**0**	**5**
C:P:A = 5:0:0					
		L	**T**	**P**	**H**
		4	**1**	**0**	**5**

UNIT- I: DIFFERENTIAL CALCULUS **15**

Derivative of a function – Various formulae – Product and quotient rule of differentiation – Differentiation of function of function (chain rule) – Trigonometric functions – Inverse trigonometric functions – Exponential function – Logarithmic functions – Logarithmic differentiation - Higher derivatives – Successive differentiation – Liebnitz theorem.

UNIT- II: INTEGRAL CALCULUS **15**

Constant of integration – Indefinite integral – Elementary integral formulae – Methods of integration – Integration by substitution - Integration by parts - Integration through partial fractions – Concept of definite integral – Properties of definite integral

UNIT- III: MATRICES AND DETERMINANTS **15**

Definition and types of matrices – Matrix Operation – Determinants – Solution of system of linear equations by Matrix method.

UNIT- IV: SERIES **15**

Binomial theorem for a rational index – Exponential and Logarithmic series – Summation of the above series

UNIT –V: TWO DIMENSIONAL ANALYTICAL GEOMETRY **15**

Cartesian coordinate system – Introduction to polar coordinates – Distance between two points – Section formulae – Area of triangle – Locus and its equations – Straight line: Equation of a straight line parallel to an axis – slope form –normal form - Intercept form through two point -condition of concurrency of three lines.

LECTURE	**TUTORIAL**	**TOTAL**
60	**15**	**75**

TEXT BOOKS

1.T. K. Manicavachagom Pillay, T. Natarajan, K. S. Ganapathy, Algebra, Volume I , S.Vishvanathan Printers and Publishers Pvt., Ltd, Chennai 2004.

2. S.Naravanan, T.K.Manicavachagam Pillay, S.Vishvanathan, Calculus volume I & II Printers and Publishers Pvt., Ltd, Chennai 2009,9th edition

REFERENCES

1. P.Kandasamy&K.Thilagavathi, B.Sc Mathematics for branch I – Vol I & Vol II, S.Chand& Co, 2004.

E REFERENCES

1. Advanced Engineering Mathematics Prof. PratimaPanigrahi
2. Department of Mathematics Indian Institute of Technology, Kharagpur.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	0	1	0	1	0	0
CO 2	3	1	0	0	1	0	1	0	0
CO 3	3	1	0	0	1	0	1	0	0
CO 4	3	1	0	0	1	0	1	0	0
CO 5	3	1	0	0	1	0	1	0	0
Total	15	5	0	0	5	0	5	0	0
Course	3	1	0	0	1	0	1	0	0

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA 105 COMPUTER ORGANIZATION AND ARCHITECTURE

Course Outcomes:

CO1	C	Knowledge	***Demonstrate*** basic number systems, Boolean expression simplification and logic gates manipulation
CO2	C	Understand	***Explain*** the functions of various components in digital system
CO3	C	Knowledge	***Describe*** general Instruction types, formats, addressing modes and organization
CO4	C	Understand	***Summarize***various modes of Data transfer and interface
CO5	C	Knowledge	***Classifies*** memory organization and management

COURSE CODE	COURSE NAME	L	T	P	C
XCA 105	COMPUTER ORGANIZATION AND ARCHITECTURE	3	2	0	5
C:P:A = 5:0:0					
		L	T	P	H
		3	2	0	5

UNIT –I: NUMBER SYSTEM AND BOOLEAN LOGIC	**15**
Introduction: Simple Computer Organization - Number System – Data Representation – Complements – Subtraction of unsigned numbers- Arithmetic Addition and Subtraction Boolean Algebra – Truth Tables -Logic Gates - Map Simplification- Other Binary codes- Error detection codes	
UNIT- II: COMBINATIONAL AND SEQUENTIAL CIRCUIT	**15**
Combinational Circuit - Half adder, Full Adder - Decoders – Multiplexer – Sequential circuit - Flip Flops: RS, JK, D, T Flip Flops – Excitation Table – Master / Slave Flip Flop- Registers – Counters.	
UNIT- III: INSTRUCTION FORMATS AND TYPES	**15**
Instruction codes – Computer Registers- Basic Computer Instructions-Components of CPU-General Register Organization – Instruction Format – Instruction Type - Addressing Modes – Memory Reference Instructions – Data Transfer and ManipulationInstruction – Shift Instruction.	
UNIT –IV: INPUT OUTPUT ORGANIZATION	**15**
Peripheral Devices – Input Interface – I/O Bus and Interface modules- Asynchronous Data Transfer – Modes of Transfer – Direct Memory Access.	
UNIT- V: MEMORY ORGANIZATION	**15**
Memory Hierarchy – Main Memory - Auxiliary Memory – Associative Memory- Cache – Virtual Memory.	

LECTURE	TUTORIAL	TOTAL
45	30	75

TEXT

1. M.Morris Mano “Computer System Architecture”, Pearson Education, Third Edition 2007.
2. M.Morris Mano “Digital Logic and Computer Design”, Pearson Education, 1979, Tenth Impression: 2008.

REFERENCES

1. William Stallings, “Computer Organization and Architecture – Designing for Performance”, Eighth Edition, 2010.
2. Thomas C.Bartee, “Computer Organization and Digital Logic” Pearson Education, Seventh Edition, 2006.
3. John P.Hayes, ”Computer Architecture and Organization”, McGraw-Hill.

E REFERENCES

1. NPTEL, Computer Architecture, Prof. Anshul Kumar, Department of Computer Science &Engineering ,IIT Delhi.

2. NPTEL, Digital Computer Organization by Prof.P.K. Biswas, Department of Electronics and Electrical Communication Engineering, IIT Kharagpur.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	2	1	0	0	0	0	0	0	0
CO 2	3	0	0	0	0	0	0	0	0
CO 3	2	1	0	0	0	0	1	0	0
CO 4	2	0	0	0	0	0	1	0	0
CO 5	2	1	0	0	0	0	1	0	0
Total	11	3	0	0	0	0	3	0	0
Course	3	1	0	0	0	0	1	0	0

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XUM106 HUMAN ETHICS, VALUES, RIGHTS AND GENDER EQUALITY

Course Outcomes :

CO1	C	Remember	***Relate*** and ***Interpret*** the human ethics and human relationships
CO2	C A	Understanding, Applying	***Explain*** and ***Apply*** gender issues, equality and violence against women
CO3	C A	Analyzing, Receiving	***Classify*** and ***Develop*** the identify of human rights and their violations
CO4	C A	Understanding, Analyze	***Classify***and***Dissect*** necessity of human rights and report on violations.
CO5	C A	Remember, Respond	***List*** and **respond** to family values, universal brotherhood, fight against corruption by common man and good governance.

COURSE CODE	COURSE NAME	L	T	P	C
XUM 106	HUMAN ETHICS, VALUES, RIGHTS AND GENDER EQUALITY	3	0	0	0
C:P:A =0:0:0		L	T P	S S	H
		1	0 0	2	3

UNIT –I: HUMAN ETHICS AND VALUES **03**

Human Ethics and values - Understanding of oneself and others- motives and needs- Social service, Social Justice, Dignity and worth, Harmony in human relationship: Family and Society, Integrity and Competence, Caring and Sharing, Honesty and Courage, WHO's holistic development - Valuing Time, Co-operation, Commitment, Sympathy and Empathy, Self respect, Self-Confidence, character building and Personality.

UNIT- II: GENDER EQUALITY **03**

Gender Equality - Gender Vs Sex, Concepts, definition, Gender equity, equality, and empowerment. Status of Women in India Social, Economical, Education, Health, Employment, HDI, GDI, GEM. Contributions of Dr.B.R. Ambetkar, ThanthaiPeriyar and Phule to Women Empowerment.

UNIT- III: WOMEN ISSUES AND CHALLENGES **03**

Women Issues and Challenges- Female Infanticide, Female feticide, Violence against women, Domestic violence, Sexual Harassment, Trafficking, Access to education, Marriage. Remedial Measures – Acts related to women: Political Right, Property Rights, Right to Education, Medical Termination of Pregnancy Act, and Dowry Prohibition Act.

UNIT- IV: HUMAN RIGHTS **03**

Human Rights Movement in India – The preamble to the Constitution of India, Human Rights and Duties, Universal Declaration of Human Rights (UDHR), Civil, Political, Economical, Social and Cultural Rights, Rights against torture, Discrimination and forced Labour, Rights of Children. National Human Rights Commission and other statutory Commissions, Creation of Human Rights Literacy and Awareness. - Intellectual Property Rights (IPR). National Policy on occupational safety, occupational health and working environment.

UNIT- V: GOOD GOVERNANCE AND ADDRESSING SOCIAL ISSUES	03
Good Governance - Democracy, People's Participation, Transparency in governance and audit, Corruption, Impact of corruption on society, whom to make corruption complaints, fight against corruption and related issues, Fairness in criminal justice administration, Government system of Redressal. Creation of People friendly environment and universal brotherhood.	

LECTURE	TOTAL
15	15

REFERENCES

1. Aftab A, (Ed.), Human Rights in India: Issues and Challenges, (New Delhi: Raj Publications, 2012).
2. Veeramani, K. (ed) Periyar Feminism, (PeriyarManiammai University, Vallam, Thanjavur: 2010).
3. Planning Commission report on Occupational Health and Safety http://planningcommission.nic.in/aboutus/committee/wrkgrp12/wg_occup_safety.p
4. Central Vigilance Commission (Gov. of India) website: http://cvc.nic.in/welcome.html.
5. Weblink of Transparency International: https://www.transparency.org/
6. Weblink Status report: https://www.hrw.org/world-report/2015/country-chapters/india

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	0	0	0	0	2	2	1	0	0
CO 2	0	0	0	0	2	2	0	0	0
CO 3	0	0	0	0	0	2	0	0	0
CO 4	0	0	0	0	0	2	1	0	0
CO 5	0	0	0	0	0	3	0	0	0
Total	0	0	0	0	4	11	2	0	0
Course	0	0	0	0	1	3	1	0	0

0 – No relation, 1 – Low relation, 2 – Medium relation, 3 – High relation

XES202 ENVIRONMENTAL STUDIES

Course Outcomes

CO1	C	Remember Understand	***Describe*** the significance of natural resources and ***explain*** anthropogenic impacts.
CO2	C	Understand	***Illustrate*** the significance of ecosystem, biodiversity and natural geo bio chemical cycles for maintaining ecological balance
CO3	C A	Remember Receive	***Identify*** the facts, consequences, preventive measures of major pollutions and ***recognize*** the disaster phenomenon
CO4	C	Understand Analyse	***Explain*** the socio-economic, policy dynamics and***practice*** the control measures of global issues for sustainable development
CO5	C	Understand Apply	***Recognize*** the impact of population and the concept of various welfare programs, and ***apply***themodern technology towards environmental protection

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XES202	**ENVIRONMENTAL STUDIES**	**2**	**0**	**0**	**2**
C:P:A = 1.8: 0 : 0.2					

		L	**T**	**P**	**SS**	**H**
		2	**0**	**0**	**1**	**3**

UNIT – I: INTRODUCTION TO ENVIRONMENTAL STUDIES AND ENERGY	**6**
Definition, scope and importance – Need for public awareness – Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, flood, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – Role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.	
UNIT – II: ECOSYSTEMS AND BIODIVERSITY	**6**
Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
UNIT – III: ENVIRONMENTAL POLLUTION	**6**
Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Solid waste management: Causes, effects and control measures of urban and	

industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: flood, earthquake, cyclone and landslide.

UNIT –IV : SOCIAL ISSUES AND THE ENVIRONMENT	**6**

Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation – Consumerism and waste products – Environment Protection Act – Air (Prevention and Control of Pollution) Act – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT –V: HUMAN POPULATION AND THE ENVIRONMENT	**6**

Population growth, variation among nations – Population explosion – Family welfare programme – Environment and human health – Human rights – Value education - HIV / AIDS – Women and Child welfare programme– Role of Information Technology in Environment and human health – Case studies.

	LECTURE	**TUTORIAL**	**TOTAL**
	30	**0**	**30**

TEXT BOOKS

1. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co, USA, 2000.
2. Michael Begon,RobertW,Howarth,ColinR.Townsend," Essentials of Ecology", Wiley, 2014
3. Disaster mitigation, Preparedness, Recovery and Response, SBS Publishers & Distributors Pvt. Ltd, New Delhi, 2006.
4. Introduction to International disaster management, Butterworth Heinemann, 2006.

REFERENCE BOOKS

1. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol.I and II, Enviro Media, India, 2009.
2. S.K.Dhameja, Environmental Engineering and Management, S.K.Kataria and Sons, New Delhi, 2012.
3. Sundar, Disaster Management, Sarup& Sons, New Delhi, 2007.
4. G.K.Ghosh, Disaster Management, A.P.H.Publishers, New Delhi, 2006.

E RESOURCES

1. http://www.e-booksdirectory.com/details.php?ebook=10526
2. https://www.free-ebooks.net/ebook/Introduction-to-Environmental-Science
3. https://www.free-ebooks.net/ebook/What-is-Biodiversity
4. https://www.learner.org/courses/envsci/unit/unit_vis.php?unit=4
5. http://bookboon.com/en/pollution-prevention-and-control-ebook
6. http://www.e-booksdirectory.com/details.php?ebook=8557
7. http://www.e-booksdirectory.com/details.php?ebook=6804
8. http://bookboon.com/en/atmospheric-pollution-ebook
9. http://www.e-booksdirectory.com/details.php?ebook=3749
10. http://www.e-booksdirectory.com/details.php?ebook=2604
11. http://www.e-booksdirectory.com/details.php?ebook=2116

12. http://www.e-booksdirectory.com/details.php?ebook=1026
13. http://www.faadooengineers.com/threads/7894-Environmental-Science

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	0	0	3	0	0	3	2
CO2	0	0	1	0	0	2	0
CO3	0	0	3	0	0	3	2
CO4	0	0	3	0	0	3	2
CO5	2	0	2	1	0	3	3
Total	2	0	12	1	0	14	9
Course	1	0	3	1	0	3	2

0-No Relation, 1- Low Relation, 2 – Medium Relation, 3- High Relation

XCA203 OBJECT ORIENTED PROGRAMMING WITH C++

Course Outcomes:

CO1	Cognitive	Remember	***Define*** *basic concepts* on object oriented programming
	Psychomotor	Apply	***Apply*** structure and inline functions
CO2	Cognitive	Understand	***Explain*** the types of inheritances and ***Applying*** various levels of Inheritance for real time problems
	Psychomotor	Apply	***Apply*** the OOPs concepts class and object
CO3	Cognitive	Understand	***Explain*** the operator Overloading functions
	Psychomotor	Apply	***Apply*** various overloading methods for different applications
CO4	Cognitive	Understand	***Describe*** and ***apply*** the Polymorphism concepts
	Affective	Apply	***Apply and implement*** operator overloading functions ***Responding*** on design of dynamic memory allocation
CO5	Cognitive	Understand	***Define and explain*** file concept and exception handlings in C++ ***Apply and implement***file operations

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA203	**OBJECT ORIENTED PROGRAMMING WITH C++**	**4**	**0**	**1**	**5**
C:P:A =3:1:1					
		L	**T**	**P**	**H**
		4	**0**	**2**	**6**

UNIT- I : INTRODUCTION TO C++	**12+6**
key concepts of Object-Oriented Programming – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If, else ,jump, goto, break, continue, Switch case statements - Loops in C++ : For,While, Do - Functions in C++ - Inline functions – Function Overloading. Lab: 1. Implement Various Control Structures. 2. Demonstrate Inline Functions 3. Implement Structure & Unions	
UNIT- II: CLASSES AND OBJECTS	**12+6**
Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – classes – Constructor and destructor with static members. Lab: 1. Implement Class and Subclass 2. Demonstrate Constructors & Destructors. 3. Programs to Implement Friend Function	
UNIT- III: OPERATOR OVERLOADING AND INHERITANCE	**12+6**
Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi	

path inheritance – Virtual base Classes – Abstract Classes.

Lab:

1. Implement Multilevel Inheritance
2. Implement Multiple Inheritance –Access Specifiers
3. Implement Hierarchical inheritance – Function Overriding /Virtual Function

UNIT-IV: POINTERS AND POLYMORPHISM **12+6**

Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding , Polymorphism and Virtual Functions.

Lab:

1. Programs to Overload Unary & Binary Operators as Member Function & Non Member Function.

UNIT- V: FILES **12+6**

File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions .

Lab:

1. Program to implement file operations

	LECTURE	PRACTICAL	TUTORIAL	TOTAL
	60	30	0	90

TEXT

1. Ashok N Kamthane , Object-Oriented Programming With ANSI andTURBOC C++, Pearson Education publication. 2003.

REFERENCES

1. E. Balagurusamy, OBJECT-ORIENTED PROGRAMMING WITH C++, Tata McGraw Hill Education Private Limited ,2011,fifthth edition

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	1	0	0	1	1	0
CO 2	3	1	0	0	0	0	0	1	0
CO 3	3	1	1	1	0	0	0	1	0
CO 4	2	1	1	1	0	0	0	1	0
CO 5	2	2	1	0	0	0	0	1	0
Total	13	6	3	3	0	0	1	5	0
Course	3	2	1	1	0	0	1	1	0

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA204 - DISCRETE MATHEMATICS

Course Outcomes:

CO1	C	Remember,	***Define*** the properties and laws of sets, relations and functions.
	A	Respond to phenomena	Participate in the class discussion in the operation of set using venn Diagram.
CO2	C	Understand	***Explain*** the basic concepts of logic to calculate the normal forms, tautologies and contradiction.
CO3	C	Apply	***Apply*** the counting principle permutation and combination and pigeonhole principle to ***solve*** the problem.
	P	Guided Response	Reproduce model related to counting principle
CO4	C	Remember, Understand	***Explain*** the types of lattices and to***show*** lattices as partially ordered sets.
CO5	C	Understand	***Explain***the properties of semi groups and groups and any set with binary operation as a semigroup and group with examples.

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COURSE CODE	COURSE NAME	L	T	P	C
XCA204	DISCRETE MATHEMATICS	4	1	0	5
C:P:A =4.5:0.25:0.25					
		L	T	P	H
		4	1	0	5

UNIT- I: SET OPERATIONS	**15**
Set notations – Basic definitions and set operations – Venn diagram – Algebraic laws of set theory – D Morgan's law. Relations: Properties of relations – Types of relations – Equivalence classes. Functions: Definition – Domain – Range and types of function- Classification of function.	
UNIT- II: NORMAL FORMS	**15**
Statements - Normal forms – CNF – DNF – PCNF - PDN – Tautologies - Contradictions.	
UNIT – III: PERMUTATION AND COMBINATION	**15**
Counting principles – The Pigeonhole principle – Counting – Permutations and Combinations – Combinatorial arguments – Countable and uncountable sets.	
UNIT- IV: LATTICES	**15**
Lattices as partially ordered set – Types of lattices – Lattices as algebraic system.	
UNIT- V: GROUPS	**15**
Binary operations – Semi groups - Groups – Examples and elementary properties.	

LECTURE	TUTORIAL	TOTAL
60	15	75

TEXT

1. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, 2002.
2. Kenneth Levasseur and Alan Doerr, "Applied Discrete Structures, Department of Mathematical Sciences, University of Massachusetts Lowell, Version 2.0, 2013.

REFERENCES

1. Kenneth H.Rosen, “Discrete Mathematics and its Application”, Fifth edition, Tata McGraw-Hill Publishing company pvt.Ltd., New Delhi,2003.
2. Kenneth H.Rosen, "Discrete Mathematics and its Applications: With Combinatorics and Graph Theory", Tata McGraw-Hill Education Pvt. Ltd, 2015.
3. Dr.M.K.Venkataraman, Dr.N.SridharanN.Chandrasekaran, “Discrete Mathematics”, the National Publishing Company, 2003.
4. Veerajan T., Discrete Mathematics with Graph Theory and Combinatorics, 10th edition,Tata McGraw Hill,2010.

E REFERENCES

1. Graph Theory A NPTEL Course, S.A. Choudum.
2. Graph Theory by Prof. L. Sunil Chandran, Computer Science and Automation Indian Institute of Science, Bangalore.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	0	0	0	1	0	1	0	0
CO 2	3	1	0	0	1	0	1	0	0
CO 3	3	1	0	1	1	0	1	0	0
CO 4	3	0	0	0	1	0	1	0	0
CO 5	3	1	0	0	1	0	1	0	0
Total	15	3	0	1	5	0	5	0	0
Course	3	1	0	1	1	0	1	0	0

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA205 COMPUTER NETWORKS

Course Outcomes:

CO1	C	Understand	***Explain***the OSI reference model used in the network
CO2	C	Understand	***Describe*** the DLL services and different protocols.
	P	Perceive	***Differentiate***various networking commands and its functions
CO3	C	Knowledge	***Compare*** the various routing algorithms.
	A	Receive	***Describes*** the congestion control in the network layer
	P	Guided Response	***Builds*** a program for the congestion control
CO4	C	Understand	***Demonstrate*** and ***Illustrate*** the transport layer and the congestion control algorithm.
	A	Organize	
	P	Adapt	***Integrates*** different socket programming using TCP and UDP ***Adapts*** different RAW sockets for packet capturing and filtering
CO5	C	Understand	***Summarize*** the application layer and the naming service.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA305	**COMPUTER NETWORKS**	**3**	**1**	**0**	**4**
C:P:A = 3:0.5:0.5					
		L	**T**	**P**	**H**
		3	**1**	**0**	**4**

UNIT-I : OVERVIEW OF COMPUTER NETWORKS — **12**

Network hardware- Network software- Protocol Hierarchies – Layering – Interfaces, services, primitives – OSI reference Model – TCP/IP reference model – physical layer – transmission media - Wireless transmission – switching.

Lab:

1. Study of network commands in C.
2. Using TCP sockets and find the date time of a server and the client

UNIT – II : DATA LINK LAYER — **12**

Services of DLL – Framing – Flow control – Error control – Error detection codes – Error correction codes – DLL protocol – Stop and Wait protocol –Sliding Window Protocol - HDLC – DLL in the internet

Lab:

1. Simulate Stop-wait-Protocol
2. Simulate Sliding window protocol

UNIT-III: NETWORK LAYER — **12**

Services of Network Layer - Routing – Shortest Path Routing Algorithm – Congestion Control – General Principle of Congestion Control Inter Network Routing – Network Layer in the Internet – IP protocol –IP address – subnets – internet control protocol

Lab:

1. Develop a program to connect the echo server & client using TCP sockets.
2. Develop a program to create a chat module using TCP sockets

UNIT- IV : TRANSPORTATION LAYER	**12**
Services of Transportation Layer – Addressing –Establishing and Releasing Connection – Flow Control – Buffering –Multiplexing – The Internet Transportation Protocol TCP and UDP Model – Connection Management – TCP Congestion Control. Lab: 1. Develop a program for resolving the DNS server using UDP sockets 2. Implement domain naming server using sockets. 3. Implement the packet capturing and filtering procedure using raw socket	
UNIT- V: APPLICATION LAYER	**12**
DNS – Name Space –Resource – Records – Name Servers - Email – Architecture and Services – User Agent – Message Format and Transfer – USENET Implementation – WWW Client and Server Sides – Locating Information on the Web Lab: 1. Develop a program for remote procedure call. 2. Simulate the Address resolution protocol using UDP. 3. Simulate a program study the performance of TCP	

	LECTURE	**TUTORIAL**	**PRACTICALS**	**TOTAL**
	45	**15**	**0**	**60**

TEXT

1. Andrew Tanenbaum , Computer Networks, PHI, 3rd Edition.
2. Larry Peterson and Bruce Davie, Computer Networks: A Systems Approach, 4th Ed. 2007.

REFERENCES

1. William Stalling,Computer networks – PHI

E REFERENCES

1. http://nptel.ac.in/courses/106105081/
2. Computer Network Topology, Prof.Sujoy Gosh, http://nptel.ac.in/video.php?subjectId=10610 5081

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	0	0	0	0	0	2
CO 2	3	1	0	0	0	0	0	0	2
CO 3	2	2	2	0	2	0	1	2	3
CO 4	2	2	0	0	2	0	1	2	2
CO 5	2	1	0	0	2	2	1	2	2
Total	12	7	2	0	6	2	3	6	11
Course	3	2	1	0	2	1	1	2	3

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA206 DATA STRUCTURES AND ALGORITHMS

Course Outcomes:

CO1	C	Understand	***Illustrate*** the classification of data types and operations of stack.
	P	Guided Response	***Build*** a program to implement the operations of stack.
	A	Receive	***Chooses*** various applications that function as stack.
CO2	C	Understand	***Explain*** the functions of queue and its types
	P	GuidedResponse	***Build*** a program to implement the operations of queue.
	A	Respond	***Selects*** the real word applications in queue
CO3	C	Understand	***Describe*** the operations of linked list and its advantages
	P	Guided Response	***Build*** an application to demonstrate the functions of linked list
	A	Respond	***Practices*** the linked list concept in real time applications
CO4	C	Knowledge	***Recall*** the recursion function in various problems.
	A	Respond	***Writes*** the recursion program for various problems in C
CO5	C	Understand	***Describe*** the concepts of tree and sorting
	P	Guided Response	***Build*** an application in C for traversing a tree and sorting concept
	A	Receive	***Gives*** the importance of tree traversing and sorting techniques.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA206	**DATA STRUCTURES ANDALGORITHMS**	**4**	**0**	**1**	**5**
C:P:A = 3.8:1:0.2					
		L	**T**	**P**	**H**
		4	**0**	**2**	**6**

UNIT- I: INTRODUCTION TO DATA STRUCTURES AND STACK **12+6**

Definition, Classification of data structures: primitives and non primitive, Operations on data structures – Definition, Array & Linked list representation of stack, Operations on stack, Applications of stacks, Infix, Prefix and Postfix notations – Conversion of an arithmetic expression from infix to postfix.

Lab:

1. Create a Stack and do the following operations using array
(i)Push (ii) Pop (iii) Peep

UNIT –II: QUEUE **12+6**

Definition, Array & Linked list representation of queue – Types of Queues: Simple queue, Circular queue, Double ended queue, Priority queue, Operations on all types of queues.

Lab:

1. Create a Queue and do the following operations using array(i)Add (ii) Remove

UNIT- III: LINKED LIST **12+6**

Definition, Components of linked list, Representation of linked list, Advantages and Disadvantages of linked list. Types of linked list: Singly linked list, doubly linked list, Circular linked list and Circularly doubly linked list. Operations on singly linked list : creation, insertion, deletion, search and display.

Lab:

1. Implement the operations on singly linked list.

UNIT- IV: RECURSION	**12+6**

Definition, Recursion in C, writing recursive programs – Binomial coefficient, Fibonacci, GCD, Factorial etc.

UNIT- V: TREE AND SORTING TECHNIQUES	**12+6**

Tree, Binary Tree, Complete Binary Tree, Binary Search Tree, Heap Tree Terminology: Root, Node, Degree of a Node And Tree, Terminal Nodes, Non-Terminal Nodes, Siblings, Level, Edge, Path, Depth, Parent Node, Ancestors of a Node. Different Types of Searching Techniques: Bubble Sort, Selection Sort, Merge Sort, Insertion – Quick Sort.

Lab:

1. Implement the following operations on a binary search tree.
   (i) Insert a node (ii) Delete a node
2. Create a binary search tree and do the following traversals
   (i)In-order (ii) Pre order (iii) Post order
3. Sort the given list of numbers using insertion sort
4. Sort the given list of numbers using quick sort.
5. Perform the following operations in a given graph
   (i) Depth first search (ii) Breadth first search

	LECTURE	TUTORIAL	PRACTICALS	TOTAL
	60	**0**	**30**	**90**

TEXT

1. A.K. Sharma, "Data Structures using C", Pearson Education, 2013
2. Robert L. Kruse"Data Structures and Program Design in C, Pearson Education, 2013

REFERENCES

1. Robert L Kruse: Data Structures and program designing using C, 2013.
2. Kamthane: Introduction to Data Structures in C, Pearson Education, 2005

E REFERENCES

1. NPTEL, Data structures and algorithm ,Prof. Hema A Murthy,IITMadras,Prof. Shankar Balachandran,IITMadras,Dr. N S. Narayanaswamy,IIT Madras
2. NPTEL, Data structures and algorithm ,Prof. Naveen Garg,IIT Delhi

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	2	1	0	1	0	1	2	0
CO 2	2	1	0	1	0	1	1	2	0
CO 3	2	1	1	1	1	0	1	2	1
CO 4	2	2	0	1	1	1	0	0	0
CO 5	2	1	1	1	1	1	1	2	1
Total	11	7	3	4	4	3	4	8	2
Course	3	2	1	1	1	1	1	2	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA301 HTML AND DHTML

Course Outcomes:

CO1	C	Remembering	***List*** out the tags of Text Formatting and Tables
	P	Set	***Starts*** to work with Text Formatting tags
	A	Responding	***Performs*** data organization in List and tables with variety of samples
CO2	C	Understanding	***Demonstrate*** the List, Links and Images.
	P	Guided Response	***Builds*** the web site with List, Links and Images.
	A	Responding	***Selects*** the necessary tag used for designing the website.
CO3	C	Apply	***Explain*** Frames in HTML for developing the webpage
	P	Guided Response	***Assembles*** all the web sites linked with Frames
CO4	C	Understanding	***Explain and Develop*** static web page with HTML form elements
	A	Guided Response	***Compiles*** the form element in a web document.
CO5	C	Understanding	***Explain*** DHTML with Java script and CSS
	P	Guided Response	***Practices*** with CSS, Java Script and DHTML
	A	Responding	***Organizes*** the Dynamic web pages with static webpages

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA301	**HTML AND DHTML**	**1**	**0**	**1**	**2**
C:P:A = 1:0.5:0.5					
		L	**T**	**P**	**H**
		1	**0**	**2**	**3**

UNIT- I: INTRODUCTION TO HTML — **15**

Designing a Home Page – HTML Document –Anchor Tag – Hyperlinks – Head and Body Sections – Header Section – Title – Prologue – Links – Colorful Pages – Comments – Body Section – Heading – Horizontal Ruler – Paragraph – Tabs – Images and Pictures – Lists and their Types – Nested Lists– Table Handling.

Lab:

1. Design a webpage using HTML Text formatting and List tags.
2. Design a webpage using HTML Tables and images.
3. Create a document with links which connects an external document.
4. Design a web page using images and Media types

UNIT- II: FRAMES AND FORMS — **15**

Frames: Frameset Definition – Frame Definition – Nested Framesets – HTML and other Media types - Forms: Forms and their Elements.

Lab:

1. Create an E-Learning document using Frames.
2. Design a Login Web page using HTML Forms.

UNIT – III : DHTML — **15**

Document Object Model – HTML and Scripting Access – Rollover Buttons – Moving objects with DHTML – Ramifications ofDHTML– Introduction to java script – Fundamentals of CSS.

Lab:

1. Design a web page using DHTML filter concept.
2. Create a web page to perform the addition of two numbers using java script.
3. Design a web page with CSS.

	LECTURE	PRACTICAL	TOTAL
	15	30	45

TEXT

1. Thomas A.Powell, "HTML: The complete Reference", Tata McGraw Hill Publications Second Edition, 1999.
2. Robert W.Sebesta, "Programming the World Wide Web", Pearson Education, Third Edition, 2007.
3. C.Xavier, "World Wide Web Designing", Tata McGraw Hill, 2000.

REFERENCES

1. Wendy Willard, "Web Design-Beginners Guide" Tata McGrawHill, 2001.
2. Ivan Bayross, "Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP", Fourth Edition, BPB Publications, New Delhi, 2010.

E REFERENCES

1. https://www.w3.org/
2. http://www.w3schools.com/

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	1	0	0	1	3	1
CO 2	3	1	0	2	0	1	2	2	0
CO 3	3	2	1	1	0	1	2	1	1
CO 4	3	2	2	2	0	1	2	1	1
CO 5	3	3	2	3	0	1	2	1	1
Total	15	9	5	9	0	4	9	8	4
Course	3	2	1	2	0	1	2	2	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA302 DATABASE MANAGEMENT SYSTEMS

Course Outcomes:

CO1	C	Knowledge	***Describe*** the database architecture and its applications
		Apply	***Sketch*** the ER diagram for real world applications
	A	Receive	***Uses*** various ER diagram for a similar concepts from various sources
CO2	C	Understand	***Discuss*** about the relational algebra and calculus
	P	Guided Response	***Construct*** various queries in SQL and PL/SQL
	A	Respond	***Compiles*** various queries in SQL, Relational Calculus and Algebra
CO3	C	Knowledge	***Describe*** the various normalization forms
		Apply	***Apply*** the normalization concepts for a table of data
	A	Receive	***Practices*** a table and implement the normalization concepts
CO4	C	Understand	***Explain*** the storage and accessing of data.
CO5	C	Understand	***Illustrate*** the query processing in database management.
		Knowledge	***Define*** the concurrency control and deadlock concept

COURSE CODE	COURSE NAME	L	T	P	C
XCA302	DATABASE MANAGEMENT SYSTEMS	4	0	1	5
C:P:A = 3: 1.75: 0.25					
		L	T	P	H
		4	0	2	6

UNIT- I : DATABASE ARCHITECTURE AND ER DIAGRAM **18**

Database system applications - Purpose of database systems - View of data- Database languages - Database architecture - Database users and administrators - History of database systems-Entity relationship modeling**: e**ntity types, entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, sub classes; super classes, inheritance, specialization and generalization

UNIT- II: RELATIONAL DATA MODEL **18**

Relational model concepts, Relational constraints, Relational Languages : Relational Algebra, The Tuple Relational Calculus - The Domain Relational Calculus - SQL: Basic Structure-Set Operations- Aggregate Functions-Null Value-Nested Sub Queries-Views Complex Queries-Modification Of Database-Joined Relations-DDL-Embedded SQL-Dynamic SQL-Other SQL Functions- -Integrity and Security.

Lab :

1. Execute a single line query and group functions.
2. Execute DDL Commands.
3. Execute DML Commands
4. Execute DCL and TCL Commands.
5. Implement the Nested Queries.
6. Implement Join operations in SQL
7. Create views for a particular table
8. Implement Locks for a particular table.

9. Write PL/SQL procedure for an application using exception handling.
10. Write PL/SQL procedure for an application using cursors.
11. Write a PL/SQL procedure for an application using functions
12. Write a PL/SQL procedure for an application using package

UNIT – III: DATA NORMALIZATION **18**

Pitfalls in relational database design – Decomposition – Functional dependencies – Normalization – First normal form – Second normal form – Third normal form – Boyce-codd normal form – Fourth normal form – Fifth normal form

UNIT- IV: STORAGE AND FILE ORGANIZATION **18**

Disks - RAID -Tertiary storage - Storage Access -File Organization – organization of files - Data Dictionary storage

UNIT- V: QUERY PROCESSING AND TRANSACTION MANAGEMENT **18**

Query Processing - Transaction Concept - Concurrency Control –Locks based protocol-Deadlock Handling -Recovery Systems

	LECTURE	TUTORIAL	PRACTICALS	TOTAL
	60	**0**	**30**	**90**

TEXT

1. Abraham Silberschatz, Henry Korth, S.Sudarshan, Database Systems Concepts, Sixth Edition, McGraw Hill, 2010.
2. Raghu Ramakrishnan and Johannes Gehrke, Database management systems, Third Edition,2002

REFERENCES

1. Bipin Desai, An Introduction to database systems, Galgotia Publications, 2010.
2. RamezElamassri, Shankant B-Navathe, Fundamentals of Database Systems, Pearson, 7th Edition, 2015

E REFERENCES

1. NPTEL, Introduction to database desigh, Dr P Sreenivasa Kumar Professor CS&E, Department, IIT, Madras
2. NPTEL, Indexing and Searching TechniquesinDatabasesDr. Arnab Bhattacharya,IIT Kanpur

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	2	1	0	0	0	0	0	2
CO 2	2	1	2	2	1	0	2	2	2
CO 3	2	2	1	2	1	0	2	2	1
CO 4	2	2	1	0	0	0	0	1	0
CO 5	2	1	1	0	0	1	2	1	1
Total	11	8	6	4	2	1	6	6	6
Course	3	2	2	1	1	1	2	2	2

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA 303 VISUAL PROGRAMMING

Course Outcomes:

CO1	C	Knowledge	***Understand*** basic controls and events
CO2	C P	Understand, Apply	***Recognize*** Various controls for different applications
CO3	C P	Understand, Apply	***Describe*** and ***apply***intrinsic and extrinsic controlsin programming
CO4	C	Understand, Apply	***Understand*** and ***implement*** connections and operations in database
CO5	C	Understand, Apply	***Understand*** and ***Implement*** various VC++ controls & events

COURSE CODE	COURSE NAME	L	T	P	C
XCA 303	VISUAL PROGRAMMING	4	0	1	5
C:P:A = 3:2:0					
		L	T	P	H
		4	0	2	6

UNIT- I : INTRODUCTION ON WINDOWS PROGRAMMING — **18**

Overview of Windows Programming - Event driven programming – GUI concepts - Data Types – Resources – Windows Messages - Basic Drawings: GDI – Device Context –Dots and Lines - creating the window – displaying the window - Text Output – Scroll Bars – Keyboard – Mouse – Menus - Software Development Kit (SDK) Tools.

UNIT- II: VISUAL BASIC PROGRAMMING — **18**

Introduction – Forms – Variables, Types – Properties, methods, events – Decision Making – Looping – Select Case - Modules – Arrays – Built-in functions - Procedures – Functions-Tool Box Controls – Responding to mouse events – Drag and drop events Responding to keyboard events – KEYPRESS, KEYUP, KEYDOWN events - shape and line control.

Lab:

1. Design a form and event handler for keyboard & mouse events
2. Visual Basic code to calculate simple and compound interest
3. Design a scientific calculator using control array
4. Design a form in visual basic for free hand writing

UNIT- III: ADVANCED CONTROLS — **18**

Menu bar - Tool bar - Message box - Input box - Dialog box - MDI – Tree view – List view – Tab strib - – File System Controls : File List Box – Directory List Box – Drive List Box – File System Objects - Projects with Multiple Forms - Do Events and Sub Main - Error Trapping.

Lab:

1. Design a simple MDI Text Editor in visual Basic
2. Designa Digital Clock in Visual Basic
3. Write a visual basic code for creating simple applications with file system controls

UNIT- IV: ODBC AND DATABASE ENGINES — **18**

Database Manager – Data Control – Record set Objects – DAO – Manipulation of records – Database Management with ODBC – RDO –ADO – ADO Control – Data Grid Control – Database Applications.

Lab:

1. Create, Update and Manipulate a content in Database

UNIT- V: VISUAL C++ **18**

VC++ Components – MFC - Resources – Getting started with AppWizard – Class Wizard - Main Window Object – Device Context - Event Handling: Handling Mouse – Graphics Device Interface - Pen, Brush, Colors, Fonts - Modal and Modeless Dialogs – Document View Architecture – Serialization – Connecting to database using VC++.

Lab:

1. Create a code for drawing various two dimensional objects
2. Create VC++ code to manipulate Mouse Interface
3. Design a code to manipulate Menu bar and Tool bar applications
4. Design a code for displaying Message Box
5. Design VC++ code for Document View Architecture
6. Create SDI & MDI applications, Modal and Modeless dialog.
7. Design VC++ code for manipulating DLLs
8. Design a code in VC++ to access data through ODBC

LECTURE	TUTORIAL	PRACTICAL	TOTAL
60	0	30	90

TEXT

1. Charles Petzold, " Programming Windows", 6th Edition, 2012, Microsoft Press
2. David I. Schneider ," Introduction to Programming Using Visual Basic", University of Maryland, Pearson, 10th Edition, 2017

REFERENCES

1. David I. Schneider, Introduction to Programming with Visual Basic 6.0, 4th Edition, 2003, Prentice Hall
2. Avanija J, Visual Programming, 3rd Edition, 2009, Anuradha Publications.

E REFERENCES

1. NPTEL, Dr.S.Arunkumar, Department of Computer Science and Engineering, IIT Delhi
2. Microsoft Visual C++: Make a Windows Forms Application by Alexanderrockandroll

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	1	0	1	2	0	2
CO 2	3	1	0	0	0	1	0	2	0
CO 3	3	0	2	2	1	1	0	2	0
CO 4	2	2	3	1	1	0	0	2	2
CO 5	3	2	3	2	1	0	0	2	2
Total	14	6	8	6	3	3	2	8	6
Course	3	2	2	1	1	1	1	2	2

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA304 STATISTICAL AND NUMERICAL METHODS

Course Outcomes:

CO1	C	Remember Understand	***Explain*** the statistical data in the form of table,diagram and graphand to ***find*** various statistics, correlation, rank correlation and regression coefficients.
CO2	C	Remember Apply	***Define*** null and alternate hypothesis and to ***Apply*** test statistic.
CO3	C	Remember	***Define*** discrete and continuous random variables and to ***Find*** the expected values and moment generating functions of discrete and continuous distributions.
CO4	C	Understand Apply	***Explain*** computational numerical methods to ***Solve*** algebraic and transcendental equations and systems of linear equations.
CO5	C	Apply	***Solve*** the Numerical Differentiation and Integration and to ***Apply the*** Trapezoidal and Simpson's rules.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA304	**STATISTICALAND NUMERICAL METHODS**	**3**	**2**	**0**	**5**
C:P:A = 5:0:0		**L**	**T**	**P**	**H**
		3	**2**	**0**	**5**

UNIT- I : MEASURES OF CENTRAL TENDENCY	**15**
Diagrammatic and graphical representation of data. Mean Median and mode, Range and standard deviation. Karl Pearson`s Coefficient of Correlation, Rank correlation, Regression – Regression coefficients, Regression Equations.	
UNIT- II: TESTING OF HYPOTHESIS	**15**
Sampling distributions - Tests for single mean, proportion, Difference of means (large and small samples) – Tests for single variance and equality of variances – χ2-test for goodness of fit – Independence of attributes.	
UNIT- III: PROBABILITY DISTRIBUTIONS	**15**
Sample space - Events - Definition of probability - conditional probability and independent events- Random variables, distributions and Mathematical expectations. Discrete distributions - Binomial – Poisson. Continuous distribution – Normal.	
UNIT- IV: NUMERICAL SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS	**15**
Numerical solution of Algebraic & Transcendental Equations - Bisection method – Newton Raphson method. Numerical solution of Simultaneous Linear Algebraic Equation – Gauss Elimination method – Gauss Jordon Elimination method – Gauss Seidel method and Gauss – Jacobi method.	
UNIT- V: NUMERICAL DIFFERENTIATION AND INTEGRATION	**15**
Numerical Differentiation - Newton's Forward difference formula and backward difference formula. Numerical Integration – Trapezoidal rule - Simpson's One-third rule – Simpson's three - eighth rule.	

LECTURE	**TUTORIAL**	**TOTAL**
45	**30**	**75**

TEXT BOOKS

1. S. C. Gupta, V. K. Kapoor, "Fundamental of Mathematical Statistics" ,Sultan Chand & Sons ,Eleventh Edition, 2014
2. P. Kandasamy , K. Thilagavathi, K. Gunavathi, Numerical Methods, S. Chand & company Ltd. New Delhi Revised Edition, 2005.

REFERENCES

1. V. Rajaraman , Computer oriented numerical methods , PHI Publication, 2013.
2. E. Balagurusamy, Numerical methods ,copyright 1999 by Tata MC Graw Hill,25th Reprint, 2008

E REFERENCES

1. Elementary Numerical Analysis, Prof. Rekha P. Kulkarni. Department of Mathematics, Indian Institute of Technology, Bombay.
2. Advanced Engineering Mathematics, Prof. Somesh Kumar, Department of Mathematics, Indian Institute of Technology, Kharagpur.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO2
CO 1	3	1	0	0	1	0	1	0	0
CO 2	3	1	0	0	1	0	1	0	0
CO 3	3	1	0	0	1	0	1	0	0
CO 4	3	1	0	0	1	0	1	0	0
CO 5	3	1	0	0	1	0	1	0	0
Total	15	5	0	0	5	0	5	0	0
Course	3	1	0	0	1	0	1	0	0

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA401 DATA ANALYTICS

Course Outcomes:

CO1	C	Understanding	***Demonstrate*** Data Management in Worksheet
	P	Guided Response	***Organises***the data in worksheet
	A	Responding	***Performs*** data organization in worksheet with variety of samples
CO2	C	Understanding	***Interpret*** Formulas in an Excel Spread sheet
	A	Responding	***Selects*** formulas for calculating the data in a spread sheet
CO3	C	Apply	***Apply*** Statistical and Mathematical functions for given samples
	P	Guided Response	***Manipulate*** the data with statistical and Mathematical functions
CO4	C	Apply	***Apply*** the type of charts to analyse the data
	P	Guided Response	***Displays***the chart for any real time data
CO5	C	Understanding	***Explain*** Analysis Toolpak for statistical concepts
	P	Set	***Starts*** to work with Analysis Toolpak
	A	Responding	***Practices*** Analysis Toolpak with different samples

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA401	**DATA ANALYTICS**	**1**	**0**	**1**	**2**
C:P:A = 1:0.5:0.5					
		L	**T**	**P**	**H**
		1	**0**	**2**	**3**

UNIT -I : INTRODUCTION TO WORKSHEET **15**

Getting Started with Excel: Excel and Spread Sheets – Excel Workbooks and Worksheets – Worksheet Cells - Excel Add-Ins – Working with Data: Data Entry – Formulas and Functions – Querying Data – Importing Data from Databases.

Lab:

1. Create a table to perform statistical and mathematical functions.
2. Create a spreadsheet to sort data and print portions of a worksheet.
3. Import and Export the data from the database and files.

UNIT- II: DATA ANALYSIS IN CHARTS **15**

Working with Charts: Excel Charts – Scatter Plots – Editing a chart – Identifying Data Points: Creating Bubble Plots – Breaking a scatter plot into categories – Plotting Several Variable.

Lab:

1. Create a spreadsheet to perform “What if?” calculations.
2. Demonstrates the ease of creating charts.
3. Draw a Histogram Diagram in MS-Excel using student data set.

UNIT- III: STATISTICAL ANALYSIS **15**

Describe Data: Variables and Descriptive Statistics - Frequency Tables :
z Creating a Frequency Table – Using Bins in a Frequency Table – Working with Histograms – Distribution Statistics – Percentiles and Quartiles – Measures of the Center: Means, Medians and the Mode – Measures of Variability – Working with Boxplots.

Lab:

1. Perform Regression analysis with given dataset.
2. Perform correlation analysis with given data.
3. Create pivot table and carry out the analysis with charts.

LECTURE	PRACTICAL	TOTAL
15	30	45

TEXT

1. Kenneth N.Berk& Patrick Carey, "Data Analysis with Microsoft Excel", 3rd Edition.
2. John Walkenbach, "Microsoft Office Excel 2007", Wiley Publishing Inc., 2007.

REFERENCES

1. Curtis Frye, "Step by Step Microsoft Office Excel 2007", First Edition, Microsoft Press.
2. Marg, Craig Stinson, "Microsoft Office Excel 2007 inside and outside", First Edition, Microsoft Press.

E REFERENCES

1.NPTEL, Dr.NandanSudarsanam, Dr.BalaramanRavindran, IIT, "Introduction to Data Analytics".

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	1	0	0	1	3	1
CO 2	3	1	0	2	0	1	2	2	0
CO 3	3	2	1	1	0	1	2	1	1
CO 4	3	2	2	2	0	1	2	1	1
CO 5	3	3	2	3	0	1	2	1	1
Total	15	9	5	9	0	4	9	8	4
Course	3	2	1	2	0	1	2	2	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA402- JAVA PROGRAMMING

Course Outcomes:

CO1	C	Knowledge	***Explain*** the history and features of java
CO2	C	Understand Apply	***Describe*** and ***implement*** the class, packages and interfaces
	A	Response	***Participating*** in creating packages and interfaces for applications domain.
CO3	C	Understand Apply	***Describe*** and ***implement*** the inheritance concepts
	P	Set	I***mplement*** various level of inheritance for given applications
CO4	C	Understand Apply	***Describe*** and ***implement*** various types of exception and its handling methods
	P	GR	***Build*** a program to implement exception handling concepts
CO5	C	Apply	***illustrate*** the Applets methods in Graphics, AWT controls and event handling
	P	GR	***Build*** an application using event handling method

COURSECODE	COURSE NAME	L	T	P	C
XCA402	JAVA PROGRAMMING	4	0	1	5
C:P:A = 3:1.5 :0.5					
		L	T	P	H
		4	0	2	6

UNIT- I: INTRODUCTION — **18**

Introduction to Java-Java and Internet-Byte codes-Features of Java-Java Development Environment- Java History -Java Development Kit (JDK)-Java Tokens-Java Character set-data types-operators-expressions-Java Statements-control statements-Simple programs- Array and Vectors-Strings and StringBuffers.

Lab

1.Program to implement simple programs based on operators, Loop and decision making statements.

2.Program to implement array

UNIT- II: CLASSES, INTERFACES AND PACKAGES — **18**

Classes-Objects-Wrapper Classes-Packages and Interfaces-extending interfaces-implementing interfaces-abstract methods.

Lab

1.Program to implement a class and instantiate its object.

2.Program to demonstrate the use of interfaces.

3.Program to implement user-defined and pre-defined packages.

UNIT- III: INHERITANCE — **18**

Inheritance Extending classes-overriding methods-finalize methods-Abstract and Final classes-Interfaces and Inheritance.

Lab

1.Program to implement constructor and overloading concepts

2.Program to implement wrapper classes.

3.Program to implement string class and string buffer class.

4.Program to implement single level and multi level inheritance.

UNIT- IV: EXCEPTION HANDLING	18
Error Handling and Exception Handling-Exception Types and Hierarchy-Try Catch blocks-Use of Throw, Throws and Finally- Programmer Defined Exceptions. Lab 1.Program to implement exception handling.	
UNIT- V: APPLETS, GRAPHICS AND FILES	**18**
Fundamentals of Applets-Graphics. AWT and Event Handling: AWT components and Event Handlers-AWT Controls and Event Handling Types and Examples-Swing- Introduction. Input and Output: Files – Streams. Multithreading. Lab 1.Program to implement a simple applet. 2.Program to implement an applet using graphics class.	

LECTURE	TUTORIAL	PRACTICAL	TOTAL
60		30	90

TEXT

1.E. Balagurusamy ,"Programming With Java ",Tata Mcgraw Hill Education Private Limited,4th Edition, 2009

2. Y. Daniel Liang,"Introuction to java programming",PearsonPublication,Tenth Edition,2013

REFERENCES

1. Deitel H M and Deitel P J, "JAVA-How to Program", Prentice Hall of India Private Limited, New Delhi, 2008.
2. D.Jana, Java and Object oriented Programming Paradigm, PHI, New Delhi, 2005.

E REFERENCES

1. http://www.nptelvideos.com/java/java_video_lectures_tutorials.php

2. http://www.nptelvideos.com/java/java_video_lectures_tutorials.php

3. http://freevideolectures.com/Course/2513/Java-Programming.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	2	0	1	0	2	0	1	3
CO 2	3	2	1	1	0	0	2	1	2
CO 3	2	2	1	2	0	0	2	0	2
CO 4	2	0	2	1	0	0	2	2	2
CO 5	2	0	2	2	0	0	0	2	2
Total	12	6	6	7	0	2	6	6	11
Course	3	2	2	2	0	1	2	2	3

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA 403 RESOURCE MANAGEMENT TECHNIQUES

Course Outcomes:

CO1	C	Understanding Apply	***Explain*** the basic concepts of optimizationand to formulate and ***Solve***Linear Programming problems.
CO2	C	Understanding Apply	***Explain*** and ***Apply*** the concepts of Transportation problem and Assignment roblem.
CO3	C	Understanding Apply	***Explain*** and Apply the concepts of sequencing problem
CO4	C	Apply	***Explain*** and ***Demonstrate*** the basic concepts of PERT-CPM and their applications in product planning control.
CO5	C	Understanding Apply	***Solve*** the Minimal Spanning Tree Problem, Shortest Route Problem, Maximal Flow Problem and Minimal Cost Capacitated Flow Problem.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA403	**RESOURCE MANAGEMENT TECHNIQUES**	**3**	**2**	**0**	**5**
C:P:A = 5:0:0					
		L	**T**	**P**	**H**
		3	**2**	**0**	**5**

UNIT- I: LINEAR MODELS	**15**
Basics of OR & Decision making - Role of computers in OR, Linear Programming Problem – Formulation, Graphical solution of two variables Canonical & standard form of LPP, Simplex method, Charne's method of penalties.	
UNIT- II: TRANSPORTATION AND ASSIGNMENT PROBLEMS	**15**
Transportation algorithm - Degeneracy algorithm- Unbalanced Transportation problem- Unbalanced assignment algorithm.	
UNIT – III: SEQUENCING PROBLEM	**15**
Processing of n jobs through two machines -Processing of n jobs through three machines- Processing of n jobs through m machines.	
UNIT- IV: PERT & CPM	**15**
Network - Fulkerson's rule- Measure of activity- PERT computation- CPM computation.	
UNIT –V: NETWORK MODELS	**15**
Network definition- Minimal spanning tree problem- Shortest route problem- Maximal flow problem- Minimal cost capacitated flow problem.	

LECTURE	**TUTORIAL**	**TOTAL**
45	**30**	**75**

TEXT

1. Hamdy A. Taha, Operations Research An Introduction, Eighth Edition, PearsonEducation, Inc., 2008
2. Kantiswaroop,Gupta P.K and Manmohan, Operations Research, Sultan Chand & Sons, New Delhi,2008

REFERENCES

1. Prem Kumar Gupta and D.S. Hira, Operations Research, S. Chand and Co., Ltd. New Delhi, 2008.
2. Gupta R. K., Linear Programming,KrishnaPrakashanMedia(P) Ltd. , 2009.

E REFERENCES

1. Lecture Series on Fundamentals of Operations Research by Prof.G.Srinivasan, Department of Management Studies, IIT Madras. For more details on NPTEL visit http://nptel.iitm.ac.in

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	0	1	0	1	0	0
CO 2	3	1	0	0	1	0	1	0	0
CO 3	3	1	0	0	1	0	1	0	0
CO 4	3	1	0	0	1	0	1	0	0
CO 5	3	1	0	0	1	0	1	0	0
Total	15	5	0	0	5	0	5	0	0
Course	3	1	0	0	1	0	1	0	0

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA404 OPERATING SYSTEMS

Course Outcomes:

CO1	C	Understanding	***Explain*** the operating system functions
CO2	C	Understanding	***Implement*** the process and various process scheduling algorithms
	P	Adapt	***Executes*** the different types of scheduling algorithms
CO3	C	Knowledge	***Outline*** process cooperation and inter process communication
	A	Receive	***Recognize*** the principles of concurrency
	P	Guided Response	***Builds*** a program model for deadlock prevention and avoidance
CO4	C	Understanding	***Describe*** various memory management concepts
	A	Organize	***Integrates*** different memory management techniques
	P	Adapt	***Apply*** the fixed size and variable size page replacement algorithm
CO5	C	Understanding	***Implement*** and ***understand*** the file organization

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA404	**OPERATING SYSTEMS**	**4**	**0**	**1**	**5**
C:P:A = 3:1.5:0					
		L	**T**	**P**	**H**
		4	**0**	**2**	**6**

UNIT I OVERVIEW OF OPERATING SYSTEMS — **18**

Functionalities and objectives of operating Systems- processor register- instruction execution- interrupts- types of interrupts.

UNIT II PROCESS MANAGEMENT — **18**

Process concepts: process states- process control block- process and threads- processor scheduling- scheduling algorithms.

Lab :
1. Simulate the FCFS - CPU Scheduling Algorithms.
2. Simulate the SJF - CPU Scheduling Algorithms.
3. Simulate the Priority - CPU Scheduling Algorithms.
4. Simulate the Round Robin - CPU Scheduling Algorithms

UNIT III PRINCIPLES OF CONCURRENCY — **18**

Critical Sections - Mutual Exclusion - Process Cooperation- Inter Process Communication- Deadlock Prevention- Detection- Avoidance- Semaphores- Monitors-Message Passing.

Lab:
1. Simulate MVT and MFT
2. Simulate Bankers algorithm for Deadlock Avoidance
3. Simulate Bankers Algorithm for deadlock Prevention

UNIT IV MEMORY MANAGEMENT — **18**

Virtual Memory Concepts- Paging and Segmentation- Address Mapping- Virtual Storage Management- Page Replacement Strategies.

Lab :

1. Simulate FIFO Page Replacement Algorithms
2. Simulate LRU Page Replacement Algorithms
3. Simulate Optimal Page Replacement Algorithms
4. Simulate Paging Technique of Memory Management

UNIT V FILE ORGANIZATION **18**

Blocking and buffering, file descriptor- file and directory structures- I/O devices- disk scheduling.

LECTURE	TUTORIAL	PRACTICALS	TOTAL
60	-	30	90

TEXT

1. William Stallings, Operating Systems , Prentice Hall of India (P) Ltd, 7th edition-2012.
2. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, Sixth edition. Addison-Wesley (2003).

REFERENCES

1. Andrew Tanenbaum, "Modern Operating Systems", Pearson, 2008.
2. Silberschatz and P. B. Galvin, "Operating System Concepts", 7th Edition, Addison Wesley Publication.

E REFERENCES

1. http://www.nptel.ac.in/courses/106108101/
2. http://nptel.ac.in/courses/Webcourse-contents/IISc-BANG/Operating%20Systems/New_index1.html
3. http://www.nptel.ac.in/downloads/106108101/

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO 2
CO 1	3	2	0	0	0	0	0	0	0
CO 2	2	1	0	0	0	0	0	0	0
CO 3	2	2	2	0	1	0	1	0	1
CO 4	2	2	0	0	1	0	1	0	1
CO 5	2	1	0	0	0	2	1	0	1
Total	11	8	2	0	2	2	3	0	3
Course	3	2	1	1	0	1	2	1	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA501 XML AND WEB SERVICES

Course Outcomes:

CO1	C	Understanding	***Explain*** the concepts of XML
	P	Set	***Starts*** to work with XML tags
CO2	C	Understanding	***Demonstrate*** the XML schema and DTD
	P	Guided Response	***Builds*** the middleware with XML schema and DTD
CO3	C	Understanding	***Explain*** the XML presentation and Transformation technique
	P	Guided Response	***Assembles*** all the CSS tags to represent the XML data
CO4	C	Understanding	***Outline*** the Web Services Building Block
CO5	C	Understanding	***Adapt*** the XML concepts to work with Webservices
	P	Guided Response	***Organizes*** the webservices with XML tags
	A	Responding	***Uses*** the XML concepts to perform the Webservices

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA501	**XML AND WEB SERVICES**	**1**	**0**	**1**	**2**
C:P:A = 1:0.5:0.5					
		L	**T**	**P**	**H**
		1	**0**	**2**	**3**

UNIT- I: FUNDAMENTALS OF XML — **15**

Role of XML - XML and the Web - XML Language Basics - SOAP - Web Services - Revolutions of XML - Service Oriented Architecture (SOA).

Lab:

1. Create a XML document to store an address book.
2. Create a XML document to store information about books and create the Internal DTD files.

UNIT –II: XML TECHNOLOGY FAMILY — **15**

XML - Name Spaces - Structuring With Schemas and DTD - Presentation Techniques - Transformation - XML Infrastructure**.**

Lab:

1. Create a XML document to store resumes for a job web site and create the External DTD file.
2. Create a XML schema for the book's XML document.
3. Present the book's XML document using cascading style sheets (CSS).
4. Write a XSLT program to extract book titles, authors, publications, book rating from the book's XML document and use formatting.

UNIT – III: WEB SERVICES BUILDING BLOCK — **15**

Overview Of SOAP - HTTP - XML-RPC - SOAP: Protocol - Message Structure - Intermediaries - Actors - Design Patterns and Faults - SOAP with Attachments

Lab:

1. Use Microsoft DOM to navigate and extract information from the book's XML document.

2. Create a web service for temperature conversion with appropriate client program.

LECTURE	PRACTICAL	TOTAL
15	30	45

TEXT

1. Ron Schmelzer, Travis Vandersypen and Jason Bloomberg, "XML and Web Services", Pearson Education, 2002.
2. Eric Newcomer and Greg Lomow, "Understanding SOA with Web Services", PearsonEducation, 2005.
3. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect's Guide", Prentice Hall, 2004.

REFERENCES

1. Frank P.Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2002.
2. Keith Ballinger, ".NET Web Services Architecture and Implementation", Pearson Education,2003.

E REFERENCES

1. https://www.w3.org/
2. http://www.w3schools.com/

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	1	2	1	1	1	1	2
CO 2	3	1	1	2	1	1	1	2	3
CO 3	3	1	1	3	1	1	2	1	2
CO 4	3	2	3	3	1	1	2	2	3
CO 5	3	3	3	3	1	1	2	2	3
Total	15	8	9	13	5	5	8	8	13
Course	3	2	2	3	1	1	2	2	3

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA502A SOFTWARE ENGINEERING

Course Outcomes:

CO1	C	Understand	***Explain***the various types of software process models
CO2	C	Understand	***Illustrate*** *the* ***c***oncept of software planning activities, risk management and estimation
CO3	C	Knowledge	***Describe*** the various software design models
CO4	C	Understand Understand	***Derive*** and ***Illustrate*** the test case and various testing methods
CO5	C	Understand	***Summarize*** the software configuration management and quality assurance

COURSE CODE	COURSE NAME	L	T	P	C
XCA502A	SOFTWARE ENGINEERING	4	1	0	5
C:P:A = 5:0:0					
		L	T	P	H
		4	1	0	5

UNIT- I : SOFTWARE PROCESS MODELS — **15**

A generic view of process - Process models: The waterfall model – Incremental model – Evolutionary model – Specialized model – The unified process–Agile process – Agile models

UNIT- II: SOFTWARE PROJECT AND RISK MANAGEMENT — **15**

Project management - Project planning – Resources – Project estimation - Software project scheduling- Risk management - System engineering — Requirements engineering

UNIT- III: SOFTWARE DESIGN — **15**

Design concepts – Design models – Pattern based design – Architectural design – Component level design – User interface : analysis and design

UNIT- IV: SOFTWARE TESTING — **15**

Software testing – Strategies – conventional software - Object oriented software – Validation testing – System testing – Debugging - Testing tactics – Testing fundamentals – White box testing – Basis path testing – Control structure testing – Black box testing.

UNIT –V: SCM AND QUALITY ASSURANCE — **15**

Software configuration and management – Features – SCM process – Software quality concepts – Quality assurance – Software review– Technical reviews – Formal approach to software quality assurance – Statistical software quality assurance - Reliability – Quality standards – Software quality assurance plan

LECTURE	TUTORIAL	TOTAL
60	15	75

TEXT

1. Roger Pressman.S., Software Engineering: A Practitioner's Approach, Sixth Edition, Mcgraw Hill, 2008.
2. Jalote Pankaj, An Integrated Approach to Software Engineering, Third Edition, Narosa Book Distributors Pvt Ltd, 2005.

REFERENCES

1. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli, Fundamentals of Software Engineering,

Prentice Hall Of India, 1991.
2. I. Sommerville, Software Engineering, Eighth Edition, Pearson Education, 2006

E REFERENCES

1. NPTEL, Software Engineering, Prof. N. L. Sarda Computer Science & Engineering Indian Institute of Technology, Bombay

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	2	0	0	0	0	0	1	0
CO 2	2	1	0	0	0	0	0	1	0
CO 3	2	2	2	0	1	0	1	2	1
CO 4	2	2	0	0	1	0	1	2	1
CO 5	2	1	0	0	0	2	1	1	1
Total	11	8	2	0	2	2	3	7	3
Course	3	2	1	0	1	1	1	2	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA502B COMPILER DESIGN

Course Outcomes:

CO1	C	Knowledge	***Describe*** the role of compilers
CO2	C	Understand	***Understand*** parser, parsing and grammar
CO3	C	Understand	***Understand*** Boolean Algebra and intermediate code generation
CO4	C	Understand	***Understand*** various types of errors and code generation
CO5	C	Apply	***Apply*** optimization and storage management

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA502B	**COMPILER DESIGN**	**4**	**1**	**0**	**5**
C:P:A = 5:0:0					
		L	**T**	**P**	**H**
		4	**1**	**0**	**5**

UNIT- I: INTRODUCTION TO COMPILERS	**15**
Compliers and Translator – Phases of a compiler – Lexical analysis – Syntax analysis – Intermediate code generation – optimization – code generation – Complier – writing tools. – A simple approach to the design of lexical analyzers- Regular expressions to finite automata – Minimizing the number of states of a DFA.	
UNIT- II: SYNTAX ANALYSIS	**15**
Context Free Grammars – Role of the parser –Writing Grammars – Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing - predictive parsers.	
UNIT- III: INTERMEDIATE CODE GENERATION	**15**
Intermediate languages – implementation of syntax - intermediate code – postfix notation – parse trees and syntax trees - Declarations – Assignment Statements – Boolean Expressions – Case Statements – Symbol table - Back patching – Procedure calls.	
UNIT- IV: CODE GENERATION	**15**
Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator.	
UNIT- V: CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS	**15**
The principle sources of optimization – Optimization of basic Blocks - loop optimization – value numbers and algebraic laws – Global data flow analysis. Code generation: Object programs – problems in code generation – Source Language issues – Runtime Environments - Storage Organization.	

	LECTURE	**TUTORIAL**	**TOTAL**
	60	**15**	**75**

TEXT

1. A. V. Aho, and J. D. Ullman , Principle of Compiler Design, Narosa Publication, ISBN : 81-85015-61-9
2. J.P. Bennet, Introduction to Compiler Techniques, Second Edition, Tata McGraw-

Hill,2003

REFERENCES

1. John C Martin, Introduction to Languages and the Theory of Computation, Tata Mc Graw-Hill Publication, ISBN : 0-07-049939-X
2. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, Compilers Principles, Techniques and Tools, Pearson Education Asia, 2003

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	0	1	0	0	2	0
CO 2	3	1	0	0	0	1	0	2	0
CO 3	2	1	1	0	0	1	0	2	0
CO 4	2	1	0	0	0	0	1	2	0
CO 5	2	2	0	0	0	0	0	2	1
Total	12	6	1	0	1	2	1	10	1
Course	3	2	1	0	1	1	1	2	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA503A UNIX AND SHELL PROGRAMMING

Course Outcomes:

CO1	C	Understanding	***Explain*** UNIX operating system and architectures
	P	Guided Response	***Builds*** an operating system environment to work with various applications.
	A	Responding	***Performs*** networking commandsin an operating system
CO2	C	Understanding	***Explain*** UNIX File Systems and Commands
	A	Responding	***Selects*** commands to perform the execution
CO3	C	Understanding	***Describe*** the operating system processes and its execution
	P	Guided Response	***Manipulate*** the UNIX processes
CO4	C	Understanding	***Explain*** the Shell Environment concepts
	P	Guided Response	***Displays*** the Shell environment and processing technique
CO5	C	Understanding	***Explain*** Shell Programming statements
	P	Set	***Starts*** to work with Shell Programming
	A	Responding	***Practices*** the Shell programming control structures

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA503A	**UNIX AND SHELL PROGRAMMING**	**4**	**0**	**1**	**5**
C:P:A = 3:1.5:0.5					
		L	**T**	**P**	**H**
		4	**0**	**2**	**6**

UNIT- I: INTRODUCTION TO UNIX — **18**

Unix Operating System – The System Administrator - Logging in – Logging out – Hands on Session – POSIX and the Single UNIX Specification – Linux and GNU - The UNIX architecture – Features of UNIX.

Lab:

1. Execution of various file/directory handling commands.
2. Shell scripts to check various attributes of files and directories.
3. Shell scripts to explore system variables such as PATH, HOME etc.

UNIT –II: FILE SYSTEM — **18**

File – File name – File System Hierarchy – Unix File System – Absolute Pathnames and commands – Home Directory – Unix Commands: pwd, cd, mkdir,rmdir,ls,cp,mv,cat,more,wc,lp- Converting between DOS and UNIX – Compression Programs.

Lab:

1. Use seed instruction to process /etc/password file.
2. Shell scripts to check and list attributes of processes.

UNIT- III: PROCESS — **18**

Process basics – The shell and init – Displaying Process Attributes – System processes and init – Process creation mechanism – inherited process attributes – Process states and zombies – signal handling – Running jobs in background.

Lab:

1. Write awk script that uses all of its features.

2. Write a shell script to display list of users currently logged in.
3. Write a shell script to delete all the temporary files.

UNIT- IV: SHELL **18**

The shell as command processor – Shell offerings – pattern matching – Escaping and quoting – Redirection – Collective Manipulation - Special Files – Pipes – Creating a Tee – Command Substitution – Shell variables – Environment Variables.

Lab:

1. Write a shell script to ask your name, program name and enrolment number and print it on the screen.
2. Write a shell program to exchange the values of two variables.

UNIT- V: SHELL PROGRAMMING **18**

Shell Scripts – read – command line arguments – Exit status of a command – Logical operation – The if conditional – Using test and [ ] to evaluate expressions – The case conditional – Computation and String handling – Looping statements – Manipulating positional parameters with set and shift – Shell Functions.

Lab:

1. Write a shell program to find the Fibonacci series.
2. Write a shell program to concatenate two strings and find the length of the resultant string.
3. Write a shell program to find factorial of given number.
4. Write a shell program to find the sum of all the digits in a given number.
5. Write a shell program to find the sum of the series sum=1+1/2+…+1/n.
6. Write a shell program to check whether a given string is palindrome or not.

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	60		30	90

TEXT

1. Sumitabha Das, "Unix and Shell Programming", Tata McGraw Hill Publications, Fifth Edition,2009, New Delhi.

REFERENCES

1. Sumitabha Das, "Unix – Concepts and Applications", Third Edition, Tata McGraw Hill Publications, New Delhi.
2. Graham Glass and King Ables, "Unix for Programmers and Users", Third Edition, Pearson Education India (Low Prices Edition).

E REFERENCES

1. NPTEL, Prof. Sorav Bansal, IIT Delhi, "Operating System".
2. NPTEL, Prof. P.C.P.Bhatt,IISc Bangalore, "Operating System".

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	0	1	1	1	1	2
CO 2	3	1	1	0	1	0	1	1	2
CO 3	3	2	1	0	2	1	0	2	3
CO 4	3	2	1	0	2	1	1	3	3
CO 5	3	2	1	0	2	1	1	3	3
Total	15	8	4	0	8	4	4	10	13
Course	3	2	1	0	2	1	1	2	3

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA503B WEB SCRIPTING FRAMEWORK

Course Outcomes:

CO1	C	Understanding	***Explain*** Java Script concepts used in Web programming
	P	Guided Response	***Builds*** web programs with java script statements
	A	Responding	***Reports*** the web pages developed with Java script
CO2	C	Understanding	***Demonstrate*** VB Script concepts
	P	Guided Response	***Constructs*** the VB Script programs with various statements
	A	Responding	***Uses*** the VB Script concepts to create the programs
CO3	C	Understanding	***Explain*** the concepts of Ruby on Rails
	P	Guided Response	***Organizes*** the concepts to create the web pages
CO4	C	Understanding	***Explain*** the concepts of Struts
	P	Guided Response	***Builds*** a programwith Struts
CO5	C	Understanding	***Explain*** the concepts of Hibernate
	P	Set	***Starts*** to work with Hibernate
	A	Responding	***Practices*** concepts of Hibernate

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA503B	**WEB SCRIPTING FRAMEWORK**	**4**	**0**	**1**	**5**
C:P:A = 3:1.5:0.5					
		L	**T**	**P**	**H**
		4	**0**	**2**	**6**

UNIT- I: JAVA SCRIPT — **18**

Introduction to Java Script: Adding Java Script to XHTML Documents – Java Script Core Features: Overview – Language Characteristics – Arrays – Objects – Expressions – Operators – Control Statements – Loop – Functions – Input/Output statements in JavaScript – Data types and Variables – Operators, Expressions and Statements – Event Handling.

Lab:

1. Write a java script program with arrays.
2. Write a java script program using control structure.
3. Write a java script program using Functions.
4. Write a java script program with dialog boxes
5. Write a program to perform the events with java script

UNIT- II: VB SCRIPT — **18**

Introductionto VB Script – Data Types – Variables and Procedures – Control of Flow – Error Handling and Debugging – Client side Web Scripting – Script Encoding.

Lab:

1. Write a program to perform the control structure in VB script.
2. Write a program to display the day in a week using VB script.
3. Write a program to calculate the simple interest using VB script events.
4. Write a program to validate the user using VB script with HTML form element

UNIT – III: RUBY ON RAILS	**18**
Introduction – Up and Running – Version Control with GIT – Deploying – A Demo App: Planning the Application – Static Pages: First Tests – Dynamic pages – Rails –Flavored Ruby: Strings and Methods – Ruby Classes. Lab: 1. Writing a web application using ruby on rails.	
UNIT- IV: STRUTS	**18**
Framework – MFC Architecture – Overview – Environment Set up – Struts Architecture - Struts Actions - Interceptors – UI component tag reference. Lab: 1. Create a program using struts.	
UNIT -V : HIBERNATE	**18**
Hibernate Overview – Hibernate Architecture – Hibernate Environment setup – Hibernate Examples: Create POJO classes – Create Database Tables – Create Mapping configuration File – Application File – Compilation and Execution. Lab: 3. Build a simple application with Hibernate	

	LECTURE	**TUTORIAL**	**PRACTICAL**	**TOTAL**
	60	**0**	**30**	**90**

TEXT

1. Thomas Powell and Fritz Schneider, “Java Script 2.0 - The complete Reference”, Second Edition, Tata McGraw Hill Publications, 2004.
2. Michael Hartl, “Ruby on Rails Tutorial”, Second Edition, Addison Wesley Professional Ruby Series, 2015.
3. Donald Brown, Chad Michael Davis and Scott Stanlick, “Struts 2 in Action”, Manning Publications Co., 2008.

REFERENCES

1. Dave Minter and Jeff Linwood, “Beginning Hibernate From Novice to Profession”, Apress Publications, 2006.
2. Adrian Kingsley-Hughes, Kathie Kingsley-Hughes, Daniel Read, “VBScript Programmer’s Reference”, Third Edition, Wiley Publications, 2007.

E REFERENCES

1. www.tutorialspoint.com – Hibernate Java Persistence Framework tutorials point.
2. www.tutorialspoint.com – Struts – 2.X tutorials point.
3. http://www.scribd.com/doc/25244173/Java-Struts-Hibernate-Tutorial - Java & Struts2 & Spring & Hibernate & Eclipse Tutorial Building a web app from scratch.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	1	0	1	1	1	1	2
CO 2	3	2	1	0	1	1	1	1	2
CO 3	3	2	1	0	2	1	1	2	3
CO 4	3	2	1	0	2	1	1	3	3
CO 5	3	2	1	0	2	1	1	3	3
Total	15	9	5	0	8	5	5	10	13
Course	3	2	1	0	2	1	1	2	3

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA504A ENTERPRISE RESOURCE PLANNING

Course Outcomes:

CO1	C	Understanding	***Explain***the functionalities of Enterprise resource planning
CO2	C	Understanding	***Characterize*** the ERP implementation procedures
CO3	C	Knowledge	***Describes*** the elements of ERP
CO4	C	Understanding	***Differentiate*** the available ERP packages
CO5	C	Understanding	***Summarize*** the models of ERP with other related technologies

COURSE CODE	COURSE NAME	L	T	P	C
XCA504A	ENTERPRISE RESOURCE PLANNING	4	1	0	5
C:P:A = 5:0:0					
		L	T	P	H
		4	1	0	5

UNIT -I : INTRODUCTION	**15**
ERP: An Overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, OLAP, SCM	
UNIT- II: ERP IMPLEMENTATION	**15**
ERP Implementation Lifecycle, Implementation Methodology, Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contract with Vendors.	
UNIT- III: THE BUSINESS MODULES	**15**
Business modules in an ERP Package, Finance, Manufacturing, Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution	
UNIT- IV: ERP PACKAGES	**15**
ERP Market Place, SAP AG, PeopleSoft, Baan, JD Edwards, Oracle, QAD, SSA	
UNIT- V: ERP –PRESENT AND FUTURE	**15**
Turbo Charge the ERP System, EIA, ERP and e-Commerce, ERP and Internet, Future Directions	

	LECTURE	TUTORIAL	TOTAL
	60	15	75

TEXT

1. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, New Delhi, 2000

REFERENCES

1.Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, ThompsonCourseTechnology,USA,2001.

2. Vinod Kumar Garg and Venkitakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI, New Delhi, 2003

E REFERENCES

1. ERP, Prof. P. K. Biswas, Dept. of Electronics and Elecrical Communication Engg., IIT, Kharagpur

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	0	0	0	0	0	0
CO 2	2	1	0	0	0	0	0	0	0
CO 3	2	1	0	0	1	0	1	0	1
CO 4	2	2	0	0	1	0	1	0	1
CO 5	3	1	0	0	0	2	1	0	1
Total	12	6	0	0	2	2	3	0	3
Course	3	2	0	0	1	1	1	0	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA504B ORGANIZATIONAL BEHAVIOR

Course Outcomes:

CO1	C	Understand	***Explain*** the organizational behavior and human relations.
CO2	K	Knowledge	***Analyse*** the individual behaviors, perceptions and emotions
	A	Characterization	***Reaction*** to many different situations
CO3	U	Understand	***Understanding*** the job characteristics and motivation theory.
CO4	U	Understand	***Demonstrate*** the decision making and creativity.
	A	Organization	Recognizing own abilities and responsibilities
CO5	C	Understand	***Understanding*** group behavior and teamwork.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA504B	**ORGANIZATIONAL BEHAVIOR**	**4**	**1**	**0**	**5**
C:P:A = 4:0:1					
		L	**T**	**P**	**H**
		4	**1**	**0**	**5**

UNIT- I : INTRODUCTION TO ORGANIZATIONAL BEHAVIOUR	**15**
Introduction to Organizational Behavior -Understanding People at Work -The Evolution of the Field of Organizational Behavior-The Human Relations Movement-The Total Quality Management Movement-The Information Technology Revolution and E-Business-Workforce Diversity-Globalization.	
UNIT- II: INDIVIDUAL BEHAVIOR	**15**
Perception, Personality, and Emotion-Social Perception stages-Managerial Implications-Self-Perception-Self-Esteem-Self-Efficacy-Self-Monitoring-Causal Attributions -Attributional Tendencies-Personality Dynamics-The Big Five Personality Dimensions-Locus of Control: Self or Environment-Attitudes-Emotions in the Workplace-Positive and Negative Emotions-Research Insights-Emotional Intelligence.	
UNIT- III: MOTIVATION	**15**
The Fundamentals of Employee Motivation-Need Theories of Motivation-Motivating Employees through Job Design-The Job Characteristics Model-Job Enlargement-Job Rotation-Job Enrichment-Process-Theories of Motivation-Equity Theory of Motivation-Expectancy Theory of Motivation-Motivation through Goal Setting-Putting Motivational Theories to Work.	
UNIT- IV: DECISION MAKING, CREATIVITY, AND ETHICS	**15**
Models of Decision Making-The Rational Model-Bounded Rationality Model-Dynamics of Decision Making-Personal Decision-Making Styles-Escalation of Commitment-Creativity-Group Decision Making-Advantages and Disadvantages of Group Decision Making-Participative Management-Group Problem-Solving Techniques-Fostering Ethical Decision Making-A Model of Ethical Behavior-Three Criteria for Ethical Decision Making -How to Improve the Organization's Ethical Climate.	
UNIT- V: GROUPS AND TEAMWORK	**15**

Fundamentals of Group Behavior-Formal and Informal Groups-The Group Development Process-Group Member Roles-Norms-Teams Trust, and Teamwork-A Team Is More Than Just a Group-Trust: A Key Ingredient of Teamwork -Self-Managed Teams-Virtual Teams-Why Do Work Teams Fail-Problems with Self-Managed Teams-Team Building.

LECTURE	TUTORIAL	TOTAL
60	15	75

TEXT

1. Robert Kreitner, Angelo Kinicki, Nina Cole, "Fundamentals of Organizational Behaviour Key Concepts, Skills, and Best Practices",Second Edition, McGraw Hill, 2002.

REFERENCES

1. Slocum and Hell Riegel, "Fundamentals OrganisationalBehaviour", Cengage learning, 2007.
2. Steven L Mcshane, Mary Ann Von Glinow and Radha R. Sharma, "Organizational Behaviour", Tata Mcgraw Hill, 2014.
3. Paul Hersey Kenneth. H. Blanchard and Dewey , "Management of Organizational Behavior: Leading Human Resources", PHI Learning, 2008.

E REFERENCES

1.http://nptel.iitm.ac.in

2.http://www.nptel.ac.in/courses/110105034/

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	2	0	0	0	0	0	0	0
CO 2	2	1	0	0	0	0	0	0	0
CO 3	2	2	2	0	1	0	1	0	1
CO 4	2	2	0	0	1	0	1	0	1
CO 5	2	1	0	0	0	2	1	0	1
Total	11	8	2	0	2	2	3	0	3
Course	3	2	1	0	1	1	1	0	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA601 INTRODUCTION TO GRAPHICS DESIGN

Course Outcomes:

CO1	C	Understand	***Understand*** various image file formats and attributes
CO2	P	Set	***Working*** with various images for different manipulations
CO3	C	Knowledge	***Understand*** painting and color options and tools
CO4	P	Set	***Design*** various invitations, posters and logo
CO5	P	Set	***Design*** a brochure, card and website

COURSE CODE	COURSE NAME	L	T	P	C
XCA601	INTRODUCTION TO GRAPHICS DESIGN	1	0	1	2
C:P:A = 1:1:0					
		L	T	P	H
		1	0	2	3

UNIT -I : IMAGE AND FILE FORMATS	**5**
Image formats: Vector format - Pixel format - File Compression - File formats: Properties of Bitmap Images- Monitor resolution- Image resolution- Resolution for printing- Resolution for display- Pixilation- Interpolation.	
UNIT- II: INTRODUCTION TO GIMP	**5**
Introduction to Vector Shapes and Bitmaps- Exploring the GIMPEnvironment- Using the file Browser Basic Photo Corrections	
UNIT- III: WORKING WITH SELECTION TOOLS	**5**
Basics- Masks and Channels Retouching and Repairing- Working with Brushes- Customizing Brushes- Speed Painting- Matte Painting- Creating a workspace for painting- Using Color Palette- Painting and Editing. Basic Pen Tool- Techniques- Vectors Masks- Paths and Shapes- Advanced Layer Techniques.	
Lab:	**30**

1. Create a poster for any event using GIMP
2. Make an album using GIMP
3. Create an invitation for a party
4. Create a post card with background scene
5. Make a web environment using GIMP
6. Make a template for web page using GIMP
7. Converting 2D logo into 3D view logo
8. Make a colorful brochure in GIMP
9. Business card design in GIMP
10. Using the blend effect in creating a vector flame
11. Website layout design in GIMP

LECTURE	PRACTICAL	TOTAL
15	30	45

TEXT BOOKS

1. Beginning GIMP: From Novice to Professional, Akkana Peck, Paper Back, Second Edition, 2008
2. Adobe Photoshop CC Bible, Lisa DaNaeDayley, Brad Dayley, 2014

REFERENCES

1. GIMP Pocket Reference, Sven Neumann, OReilly, 2000
2. GIMP Essential Reference, Alex Harford, Pearson Education, 1999

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	0	0	0	0	0	0
CO 2	2	1	0	0	0	0	0	0	0
CO 3	2	1	0	0	1	0	1	0	1
CO 4	2	2	0	0	1	0	1	0	1
CO 5	3	1	0	0	0	2	1	0	1
Total	12	6	0	0	2	2	3	0	3
Course	3	2	0	0	1	1	1	0	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA 602A .NET TECHNOLOGIES

Course Outcomes:

CO1	C	Knowledge	***Knowledge*** on .Net Technologies basic controls and events
CO2	C	Understand	***Knowledge*** on Object Oriented Programming with C#
CO3	C	Understand	***Understand*** and ***implement*** VB.Net
CO4	C	Understand,	***Apply*** and ***Implement*** C#.Net and VB.Net using various tools
	P	Apply	
CO5	C	Understand,	***Understand*** Framework and threads
	P	Apply	

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCA 602A	**.NET TECHNOLOGIES**	**4**	**0**	**1**	**5**
C:P:A = 4:1:0					
		L	**T**	**P**	**H**
		4	**0**	**2**	**6**

UNIT- I: INTRODUCTION TO .NET TECHNOLOGIES — **18**

Introduction to Web Technologies - HTML Basics – Scripts - Sample Programs – Advantages and Disadvantages of Client-side and Server-side Scripts –Overview of Client-side Technologies and Server-side Technologies. History of .NET - .NET Framework Components.

UNIT- II: INTRODUCTION TO C# — **18**

Introduction to C# - Overview of C#, Literals, Variables, DataTypes, Operators, Expressions, Control Structures-Methods, Arrays, Strings, Structures, Enumerations – OOPS:Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading - Delegates, Events, Errors and Exceptions.

Lab:

1. Develop a C# .NET console application to demonstrate the conditional statements.
2. Develop a C# .NET console application to demonstrate the control statements.
3. Develop an application in C#.NET that demonstrates the windows controls
4. Demonstrate Multithreaded Programming in C#.NET
5. Demonstrate subroutines and functions in C#.NET

UNIT- III: INTRODUCTION TO VB.NET — **18**

Introduction VB.NET -IDE – Creating a shortcut to start VB.NET - Manoeuvrings the Toolbar – Auto-hide, Docking and Undocking, Placing and Resizing the Windows – Forms – Properties Window and Solution Explorer - Writing and Event Procedure – Execution - Basic Keywords – Data Types – VB.NET statements – Conditional statements - If Else – Select Case – Switch and Choose – Loops – Do – For Next – For Each Next – While – Arrays.

Lab:

1. Develop an application for deploying various built-in functions in VB.NET
2. Develop an MDI application for Employee Pay-roll transactions in VB.NET

UNIT- IV: APPLICATION DEVELOPMENT ON .NET — **18**

C#.NET : Building Windows Applications, VB.NET : Windows Forms – Working with Controls – Timer, Picture-box, Group-box, Combo-box, Horizontal and Vertical Scrollbar, Numeric-up-down, Track-bar, and Progress-bar – Subroutines and Functions in VB.NET – Database applications

Lab:

1. Construct a console application to demonstrate the OOP Concepts
2. Develop a web application in VB.NET for dynamic Login Processing

UNIT- V: ADO .NET CONNECTIVITY | **18**

Introduction to ADO.NET – ADO vs ADO.NET – Architecture – Data reader – data adopter - Accessing Data with ADO.NET, Programming Web Applications with Web Forms. ASP .NET applications with ADO.NET

Lab:

1. Develop a Windows application with database connectivity for core-banking transactions

	LECTURE	PRACTICAL	TUTORIAL	TOTAL
	60	30	0	90

TEXT

1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004.
2. ShirishChavan, “Visual Basic.NET”, Edition 2009, Pearson Education.Matt J. Crouch, “ASP.NET and VB.NET Web Programming”, Edition 2012.

REFERENCES

1. Art Gittleman, "Computing with C# and the .NET Framework", Jones & Bartlett Learning, 2011

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	1	0	1	2	2	0
CO 2	3	1	1	0	0	1	0	2	0
CO 3	3	0	1	1	1	1	0	2	0
CO 4	3	2	2	1	1	0	0	2	2
CO 5	3	2	2	1	1	0	0	3	2
Total	15	6	6	4	3	3	2	11	4
Course	3	2	2	1	1	1	1	3	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA602B PROGRAMMING WITH PHP AND MYSQL

Course Outcomes:

CO1	C	Understand	***Explain*** the basic function of PHP and uses of open sources technologies.
	P	Guided Response	***Build*** a program in PHP to implement the looping and conditional
CO2	C	Understand	***Explain*** the array and functions in PHP.
	P	Guided Response	***Build*** a program to implement cookies, session and file concept.
	A	Receive	***Selects*** the real word problems and applied techniques in cookies and session.
CO3	C	Understand	***Describe*** the various DB architectures, constraints and normalization forms.
CO4	C	Understand	***Explain*** the statements in MySQL and its effectiveness.
	P	Guided Response	***Build***a application to construct various queries inMySQL
	A	Receive	***Identifies*** differences between the SQL and MySQL features and functions.
CO5	C	Understand	***Describe*** to implement PHP and MySQL.
	P	Guided Response	***Build***a application to implement PHP and MySQL.

COURSE CODE	COURSE NAME	L	T	P	C
XCA602B	PROGRAMMING WITH PHP AND MYSQL	4	0	1	5
C:P:A = 3:1:1					
		L	T	P	H
		4	0	2	6

UNIT- I: INTRODUCTION TO OPEN SOURCE AND PHP **18**

Introduction- open source-PHP – history- features-variables- statements operators- conditional statements-if-switch-nesting conditions-merging forms with conditional statements-loops-while-do-for – loop iteration with break and continue.

Lab:

1. Creating simple webpage using PHP
2. Use of conditional statements and looping statements in PHP

UNIT- II: ARRAY AND FUNCTIONS **18**

Arrays: Creating an array- modifying array-processing array-grouping form with arrays- using array functions- creating user defined functions- using files- sessions- cookies- executing external programs- Creating sample applications using PHP.

Lab:

1. Creating different types of arrays
2. Creating user defined functions
3. File manipulation using PHP
4. Creation of sessions
5. Creation of cookies
6. Creating simple applications using PHP

UNIT- III: DATABASE MANAGEMENT SYSTEM **18**

Components of Database system-Definition and benefits of database-Data Independence-Three level of database architecture-Database Management system- Client server architecture-

Distributed processing-Domains-Relations-Integrity constraints-Candidate keys-Primary keys-Foreign keys-Functional dependency(Basic definition)-Normal Forms (INF, 2NF, 3NF, BCNF)-ER model – OOAD model.

UNIT- IV: MySQL **18**

Effectiveness of MySQL -MySQL Tools-Prerequisites for MySQL connection- Databases and tables- MySQL data types-Creating and manipulating tables- Insertion, updation and deletion of rows in tables -Retrieving data- Sorting and filtering retrieved data -Advanced data filtering-Data manipulation functions- Aggregate functions -Grouping data- Sub queries- Joining Tables-Set operators- Full text searching

Lab:

1. Creating simple table with constraints
2. Insertion, Updation and Deletion of rows in MYSQL tables
3. Demonstration of joining tables
4. Usage of subqueries
5. Usage of aggregate functions and set operators
6. Working with string, numeric and date functions

UNIT- V: PHP with MySQL **18**

Working MySQL with PHP-database connectivity- usage of MYSQL commands in PHP, processing result sets of queries- handling errors-debugging and diagnostic functions- validating user input through Database layer and Application layer- formatting query output with Character, Numeric, Date and time –sample database applications

Lab:

2. Database connectivity in PHP with MySQL

	LECTURE	TUTORIAL	PRACTICALS	TOTAL
	60	0	30	90

TEXT

1. VikramVaswani, PHP and MySQL, Tata McGraw-Hill, 2005
2. Ben Forta , MySQL Crash course SAMS, 2006.
3. C.J. Date, An Introduction to Database Systems, Addison Wesley, Sixth Edition.
4. Ramesh Elmasri and Shamkant B Navathe, Fundamentals of DataBase Systems, Pearson Education,Third Edition.

REFERENCES

1. Tim Converse, Joyce Park and Clark Morgan, PHP 5 and MySQL, Wiley India reprint, 2008.
2. Robert Sheldon, Geoff Moes, Beginning MySQL, Wrox, 2005

E REFERENCES

1. NPTEL, Database management systems,Dr. Arnab Bhattacharya,IIT Kanpur

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	1	1	1	1	1	2	2
CO 2	2	1	1	1	1	1	1	2	2
CO 3	2	1	1	0	0	1	1	2	2
CO 4	2	1	1	0	0	1	1	2	2
CO 5	2	2	2	0	0	1	1	3	3
Total	11	6	6	2	2	5	5	11	11
Course	3	2	2	1	1	1	1	3	3

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA603A MOBILE COMPUTING

Course Outcomes:

CO1	C	Understand	***Describes*** the medium access control layers
CO2	C	Understand	***Characterize*** the wireless transmission technologies
CO3	C	Knowledge	***Describe*** the mobile network layer and IP packet delivery
CO4	C	Understand	***Comprehend*** TCP and the transmission mobile transport layer
	A	Originate	***Characterizing*** mobile transport layer
CO5	C	Understand	***Summarize*** the WAP and its applications

COURSE CODE	COURSE NAME	L	T	P	C
XCA603A	MOBILE COMPUTING	4	1	0	5
C:P:A = 4.5:0:0.5					
		L	T	P	H
		4	1	0	5

UNIT-I : MEDIUM ACCESS CONTROL — **12**

Multiplexing- Hidden and exposed terminals-Near and far terminals. SDMA – FDMA – TDMA – CDMA- Comparison of Access Mechanisms – Telecommunication: GSM. Satellite Systems: Basics- Routing- Localization- Handover.

UNIT- II: WIRELESS NETWORKS — **12**

Wireless LAN: Advantages and Disadvantages-Infrared Vs Radio Transmission – Infrastructure Networks- Ad hoc Networks – Bluetooth- Wireless ATM: Working Group- Services- Reference Model – Functions – Radio Access Layer – Handover- Handover reference model- Requirements and Types.

UNIT- III: MOBILE NETWORK LAYER — **12**

Mobile IP : Goals – Assumptions and Requirement – Entities – IP packet Delivery- Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6.

UNIT- IV: MOBILE TRANSPORT LAYER — **12**

Traditional TCP- Indirect TCP- Snooping TCP- Mobile TCP- Fast retransmit/ Fast Recovery- Transmission/ Timeout Freezing – Selective Retransmission.

UNIT- V:WAP — **12**

Architecture – Datagram Protocol- Transport Layer Security- Transaction Protocol- Session Protocol- Application Environment-Wireless Telephony Application.

LECTURE	TUTORIAL	TOTAL
60	15	75

TEXT

1. Jochen Schiller, Mobile Communications, Addison-Wesley, second edition, 2004.
2. Stojmenovic and Cacute, Handbook of Wireless Networks and Mobile Computing, Wiley, 2002, ISBN 0471419028.

REFERENCES

1. Reza Behravanfar, Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML, ISBN: 0521817331, Cambridge University Press, October 2004
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden , Schwiebert, Loren, Fundamentals of Mobile and Pervasive Computing, ISBN: 0071412379, McGraw-Hill

Professional, 2005.

E REFERENCES

1. http://nptel.ac.in/video.php?subjectId=117102062

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	3	1	0	0	0	0	0	0	0
CO 2	2	0	0	0	0	0	0	0	0
CO 3	2	0	0	0	0	0	1	0	0
CO 4	2	0	0	0	0	0	1	0	0
CO 5	2	1	1	0	1	2	1	0	0
Total	11	2	1	0	1	2	3	0	0
Course	3	1	1	0	1	1	1	0	0

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCA603B DISTRIBUTED COMPUTING

Course Outcomes:

CO1.	Cog: U	***Explain***the Concept of Distributed Computing
	Psy: GR	**Assemble** the Networking components.
CO2.	Cog: U	***Outline the c***oncept of Message Passing
	Psy: GR	**Starts** with Message Passing.
	Aff: RES	**Practices** the Message Passing concepts
CO3.	Cog: U	***Describe***theDistributed shared memory concept.
CO4.	Cog: U	***Demonstrate*** the Resource Management concept.
	Psy: GR	**Constructs**the load balancing & sharing techniques.
	Aff: RES	**Practices** to load balancing & sharing.
CO5.	Cog: U	***Describe***theDistributed File Systems.
	Psy: GR	**Constructs** the Distributed file system techniques.

COURSE CODE	COURSE NAME	L	T	P	C
XCA603B	DISTRIBUTED COMPUTING	4	1	0	5
C:P:A 4:0.5:0.5					
		L	T	P	H
		4	1	0	5

UNIT- I : DISTRIBUTED COMPUTING SYSTEMS	**15**
Definition - System Models – Advantages of Distributed Systems – Design Challenges – Distributed Computing Environment - Networking and Internetworking - Types of Networks - Network Principles - Internet Protocols.	
UNIT- II: SYNCHRONIZATION AND RPC	**15**
Message Passing: Fundamental Concept – Features - Issues – Synchronization – Buffering – Message Encoding and Decoding – Process addressing – Failure Handling – Remote Procedure Calls: RPC Model – Transparency – Implementation – Stub Generation – RPC Messages – Marshaling – Communication Protocols – Client–Server Binding – Lightweight RPC.	
UNIT- III: DISTRIBUTED SHARED MEMORY	**15**
Basic Concept – General Architecture – Advantages – Design Issues – Structuring Approaches – Consistency Models – Replacement Strategy – Thrashing – Synchronization Mechanisms: Clock Synchronization – Event ordering – Mutual Exclusion – Deadlock – Election Algorithms.	
UNIT –IV: PROCESS MANAGEMENT	**15**
Basic Concept - Features – Task Assignment approach – Load- Balancing Approach - Load-Sharing Approach - Process Management: Basic Concept – Process Migration – Threads.	
UNIT- V: DISTRIBUTED FILE SYSTEMS	**15**
Uses – Services - Features – File Models – Accessing Models – Sharing Semantics – Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles.	

LECTURE	TUTORIAL	PRACTICAL	TOTAL
60	15	0	75

TEXT BOOKS

1. Pradeep K. Sinha,Distributed Operating Systems, Prentice Hall India, 2008, New

Delhi.

REFERENCES

1. George Coulouris, Jean Dollimore and Tim Kindberg, Distributed Systems Concepts and Design, Pearson Education, 3rd Edition, 2002.
2. Andrew S Tanenbaum , Maartenvan Steen, Distributed Systems – Principles and Pardigms, , Pearson Education, 2002

E REFERENCE

1. NPTEL - Prof. Ananthanarayana V.S. , Dept. of Information Tecchnology , N.I.T.K., Surathkal
2. http://www.nptel.ac.in/downloads/106106107

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 8	PSO 9
CO 1	2	0	1	0	0	0	0	1	1
CO 2	2	1	1	0	0	0	1	1	1
CO 3	3	1	1	0	0	1	0	0	1
CO 4	2	1	1	0	0	1	1	1	1
CO 5	2	1	0	0	0	1	1	1	1
Total	11	4	4	0	0	3	3	4	5
Course	3	1	1	0	0	1	1	1	1

0-No relation 3- Highly relation 2- Medium relation 1– Low relation

XCAOE1 C AND C++ PROGRAMMING LANGUAGE

Course Outcomes:

CO1	C	Knowledge	***Knowledge*** on C programming fundamentals
CO2	C	Understand, Apply	***Understand*** and ***Apply*** structure and union
CO3	C	Understand	***Understand*** on advanced concept of pointers and files
CO4	C	Understand	***Knowledge*** on object oriented technologies
CO5	C	Understand, Apply	***Apply*** and ***Implement*** levels of Inheritance

SUBCODE	**SUB NAME**	**L**	**T**	**P**	**C**
XCAOE1	**C AND C++ PROGRAMMING LANGUAGE**	**3**	**0**	**0**	**3**
C:P:A = 2.5:0.5:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I INTRODUCTION TO C LANGUAGE	**9**
Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input/Output Operations – Formatted I/O – Decision Making - Branching –- if, nested if , switch, goto and Looping- while, do, for statements.	
UNIT II ARRAYS, FUNCTIONS, STRUCTURES AND UNIONS	**9**
Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings – String handling Functions - User defined Functions – Categories of Functions – Recursion - Structures and Unions – Array of Structures – Structures and Functions	
UNIT III POINTERS AND FILE MANAGEMENT	**9**
Pointers – Declaration, Accessing a variable, character strings, pointers to functions and structures - File Management in C – Dynamic Memory allocation – Linked Lists – Preprocessors.	
UNIT IV INTRODUCTION TO C++	**9**
Overview of C++-Classes and Objects-Friend Functions-Friend Classes-Inline Function-Static Members-Arrays-Pointers-References-Dynamic Allocation- Function Overloading-Overloading Constructor Functions-Copy Constructors-Default Argument-Operator Overloading-Member Operator Overloading	
UNIT V ADDITIONAL FEATURES	**9**
Inheritance-Base Class-Access Control-Virtual Functions-Pure Virtual Functions-Templates-Generic Functions-Applying Generic Functions-Generic Classes-Exception Handling-C++ I/O Streams-File I/O-STL-Overview-Container Classes-Lists-Maps-Algorithms Using Functions and Objects-String Class	

	LECTURE	**PRACTICAL**	**TUTORIAL**	**TOTAL**

	45	**0**	**0**	**45**

TEXT

1. E.Balagurusamy, Programming in ANSI C , Tata McGraw Hill, 2008
2. Herbert Schildt, C++ The Complete Reference, Tata McGrawHill Edition, 2014

REFERENCES

1. Deitel and Deitel, C How to Program, Addison Wesley , 2011
2. K. N. King,C Programming: A Modern Approach, 2nd Edition**,** W. W. Norton & Company; 2 edition,2008
3. Robert Lafore, OOP in Turbo C++,Galgotia Publications, 2001

XCAOE2 DIGITAL IMAGING AND EDITING TECHNIQUES

Course Outcomes:

CO1	C	Understanding	***Explain*** the various attributes of Photoshop basics**.**
CO2	C	Understanding	***Identify*** *the* ***c***oncept of working with layers
CO3	C	Knowledge	***Describe*** the various forms of Painting tools
CO4	C	Understanding	***Recognize*** the advanced tools for making colors
CO5	C	Understanding	***Describe*** advanced techniques for selection and masking

COURSE CODE	COURSE NAME	L	T	P	C
XCA OE2	DIGITAL IMAGING AND EDITING TECHNIQUES	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I INTRODUCTION **9**

Introduction to Photoshop basics – tools - palettes and the marvels of undoing – Making selections – repositioning – transforming – cropping

UNIT II LAYERS **9**

Working with layers: adding – organizing – hiding – copying –moving – linking – merging – duplicating – flattening - opacity changes. Fonts - raster vs. vector graphics.

UNIT III PAINTING TOOLS **9**

Viewing related artwork- Technique demos: Digital painting tools - tool option pallets - painting modes - color palettes – gradients - editing brush shapes – creating - saving and loading custom made brushes.

UNIT IV WORKING WITH COLOURS **9**

Photo retouching using color replacement - hue saturation levels -patch tool - cloning stamp - healing brush - sponge tool - dodge - burn tools

UNIT V ADVANCED TECHNIQUES **9**

Advanced selection - masking techniques - layer mask - gradient masking - adjustment layers.

LECTURE	TOTAL
45	45

TEXT BOOK

1. Digital Illustration and Art Techniques covering Photoshop CS3, Derek Lea, Wiley, 2007

REFERENCE

1. Photoshop CS Essentials David D. Busch et. al., PHI, 2014.

E REFERENCE

1. NPTEL, Digital Image Prof .P. K. Biswas Department of Electronics and Electrical Communication Engineering Indian Institute of Technology, Kharagpur

XCAOE3 BUSINESS ANALYTICS WITH WORKSHEET

Course Outcomes:

CO1	C	Understanding	***Demonstrate*** Data Management in Worksheet
	P	Guided Response	***Organises*** the data in worksheet
CO2	C	Understanding	***Interpret*** Formulas in an Excel Spread sheet
	P	Perception	***Selects*** formulas for calculating the data in a spread sheet
CO3	C	Apply	***Apply*** Statistical and Mathematical functions for given samples
	P	Guided Response	***Manipulate*** the data with statistical and Mathematical functions
CO4	C	Apply	***Apply*** the types of chart to analyse the data
	P	Guided Response	***Displays*** the chart for any real time data
CO5	C	Understanding	***Explain*** Analysis Toolpak for statistical concepts
	P	Set	***Starts*** to work with Analysis Toolpak

COURSE CODE	COURSE NAME	L	T	P	C
XCAOE3	BUSINESS ANALYTICS WITH WORKSHEET	3	0	0	3
C:P:A = 2:1:0					
		L	T	P	H
		3	0	0	3

UNIT I INTRODUCTION TO WORKSHEET	**09**
Getting Started with Excel: Excel and Spread Sheets – Excel Workbooks and Worksheets – Worksheet Cells - Excel Add-Ins – Working with Data: Data Entry – Formulas and Functions – Querying Data – Importing Data from Databases.	
UNIT II DATA ANALYSIS IN CHARTS	**09**
Working with Charts: Excel Charts – Scatter Plots – Editing a chart – Identifying Data Points: Creating Bubble Plots – Breaking a scatter plot into categories – Plotting Several Variable.	
UNIT III STATISTICAL ANALYSIS	**09**
Describe Data: Variables and Descriptive Statistics - Frequency Tables : Creating a Frequency Table – Using Bins in a Frequency Table – Working with Histograms – Distribution Statistics – Percentiles and Quartiles – Measures of the Center: Means, Medians and the Mode – Measures of Variability – Working with Boxplots.	
UNIT IV STATISTICAL ANALYSIS – Part I	**09**
Probability Distributions – Normal Distributions – Excel Worksheet Functions – Confidence Intervals – Hypothesis Testing – "t" Distribution.	
UNIT V STATISTICAL ANALYSIS – Part II	**09**
Pivot tables – Performing a Regression Analysis – Checking the Regression Model – Correlation – Creating Correlation Matrix.	

LECTURE	TUTORIAL	TOTAL
45	0	45

TEXT

1. Kenneth N.Berk & Patrick Carey, "Data Analysis with Microsoft Excel", 3rd Edition.
2. John Walkenbach, "Microsoft Office Excel 2007", Wiley Publishing Inc., 2007.

REFERENCES

1. Curtis Frye, "Step by Step Microsoft Office Excel 2007", First Edition, Microsoft Press.
2. Marg, Craig Stinson, "Microsoft Office Excel 2007 inside and outside", First Edition, Microsoft Press.

E REFERENCES

1. NPTEL, Dr.Nandan Sudarsanam, Dr.Balaraman Ravindran, IIT, "Introduction to Data Analytics".

XCA OE4 ANIMATION AND IMAGING

Course Outcomes:

CO1	C	Understand	Understanding basic concepts of animation
CO2	C	Knowledge	Demonstrate tools and software for animation
CO3	C	Apply	Applying imaging techniques
CO4	C	Apply	Applying various graphic editing techniques
CO5	C	Understand	Differentiate various transformation techniques

COURSE CODE	COURSE NAME	L	T	P	C
XCA OE4	ANIMATION AND IMAGING	3	0	0	3
C:P:A 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I INTRODUCTION TO ANIMATION — **09**

Digital 2D Animation orientation – Basic factors affecting the illusion of motion – Impact of digital techniques on the craft of film and video animation – Professional animation practice and job description – Prevailing file format standards and other compatibility issues – History and future trends of computer animation application in the visual arts.

UNIT II SOFTWARE INTERFACE FOR ANIMATION — **09**

2D animation application software interface – Default setting and user preferences – Document setup. Import and export formats – Document and timeline window feature – Tools and commands palettes – Media-selection tools and techniques - Asset-management features.

UNIT III IMAGING TECHNIQUES — **09**

2D graphics-creation features – Underlying data type: raster – vector – Raster painting and/or import features – Vector shapes – Vector free-form and control-point Placement tools – Features specific to the program in use.

UNIT IV GRAPHIC EDITING — **09**

2D graphics editing features – Basic geometric transformation – Boolean Operations on shapes – Object stroke attributes – Object fill attributes – Shading Techniques (blends – gradients) – Packaged effects (extensions – Plug-ins) Features Specific to the program in use.

UNIT V IMAGE TRANFORMATION — **09**

2D animation frame-sequencing features – Straight-ahead animation – Key Frames animation – Motion paths – Applying geometric transformations over time – Intertwining options – Looping and motion – Features specific to the program in use.

LECTURE	TUTORIAL	TOTAL
45	0	45

TEXT

1. Richard Williams,The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion, and Internet Animators, Faber & Faber Publishing ,2002.
2. Frank Thomas and Olle Johnson, The Illusion of Life: Disney Animation, Disney Editions,1995.

REFERENCES

1. Preston Blair, Cartoon Animation (How to Draw and Paint series), Walter Foster Publishing, 1994.

XCAOE5 MOBILE APPLICATION DEVELOPMENT

Course Outcomes:

CO1	C	Understand	***Understand*** the mobile application architecture.
CO2	C	Understand	***Configure and Install*** Java JDK and Android SDK toolkits.
CO3	C	Knowledge	***Describe*** the user interface and different kinds of layouts.
CO4	C	Application	***Implement*** multimedia applications using android**.**
CO5	C	Analyze	***Create*** SQL database and establish connectivity with the database.

COURSE CODE	COURSE NAME	L	T	P	C
XCAOE5	MOBILE APPLICATIONS DEVELOPMENT	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I INTRODUCTION	**09**
Introduction to Mobile Applications - Characteristics - Benefits - Overview of Available Technologies - Mobile Application Design - Application Model and Infrastructure - Managing Resources - About Android.	
UNIT II CONFIGURATION OF ANDROID ENVIRONMENT	**09**
Java JDK – Android SDK – Android Development Tools – Android Virtual Devices (AVDs) – Emulators – JVM – DVM.	
UNIT III USER INTERFACE	**09**
Understanding the components of a screen -Linear Layout – Absolute Layout – Frame Layout – Relative Layout – Table Layout.	
UNIT IV DESIGNING USER INTERFACE WITH VIEW	**09**
Text view – Button – Checkbox – Toggle Button, Radio Button, Progress Bar, Auto complete TextView, Spinner – List View, Grid View, Image View, Scroll View.	
UNIT V MULTIMEDIA & DATABASE IN ANDROID	**09**
Android System Architecture – Play Audio and Video – Text to Speech - SQLite Database – Creation and Connection of the database – Extracting value from a Cursors – Transactions.	

LECTURE	TUTORIAL	TOTAL
45	0	45

TEXT

1. Reto Meier, Professional Android™ Application Development Published by Wiley Publishing, Inc., Copyright © 2009 by Indianapolis, Indiana

2. Wei-Meng Lee, Android™ Application Development Cookbook: 93 Recipes for Building Winning Apps Published by John Wiley & Sons, Inc., Copyright © 2013 Indianapolis, Indiana.

REFERENCES

1. Prasanna Kumar DIXIT , Android , by VIKAS Professional Master , First Edition 2014.

E – REFERENCES

1. http://freevideolectures.com/Course/3184/Android-Application-Development#

XCAOE6 PROGRAMMING IN PYTHON

Course Outcomes:

CO1	C	Understand	***Explain*** various types of operators, Data types, Identifiers and string handling methods.
CO2	U	Understand	***Outline*** the concept of collection data types.
CO3	U	Understand,	***Explain*** the control structures and looping.
	P	Guided Response	***Construct*** programs with control structures.
CO4	U	Understand	***Explain*** Pythons standard library, file and Directory handling
CO5	C	Understand	***Summarize*** the object oriented concepts.
	P	Set	***Construct*** a program with OOPS concepts

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCAOE6	**PROGRAMMING IN PYTHON**	**3**	**0**	**0**	**3**
C:P:A =2:1:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I INTRODUCTION TO PYTHON PROGRAMMING	**09**
Creating and Running Python Programs -Data Types-Object References- Collection Data Types-Logical Operations-Control Flow Statements- Arithmetic Operators- Input/Output-Creating and Calling Functions-Examples-Data Types-Identifiers and Keywords-Integral Types-Integers-Booleans--Floating-Point Types-Floating-Point Numbers-Complex Numbers-Decimal Numbers-Strings-Comparing Strings-Slicing and triding Strings-String Operators and Methods-String Formatting with the str.format() Method-Character Encodings.	
UNIT II COLLECTION DATA TYPES	**09**
Sequence Types-Tuples-Named Tuples-Lists-Set Types-Sets-Frozen Sets-Mapping Types-Dictionaries-Default Dictionaries-Ordered Dictionaries-Iterating and Copying Collections-Iterators and Iterable Operations and Functions-Copying Collections	
UNIT III CONTROL STRUCTURES AND FUNCTIONS	**09**
Control Structures-Conditional Branching-Looping-Exception Handling-Catching and Raising Exceptions-Custom Exceptions- Custom Functions-Names and Docstrings-Argument and Parameter Unpacking-Accessing Variables in the Global Scope	
UNIT IV MODULES AND PACKAGES	**09**
Packages-Custom Modules-Overview of Python's Standard Library-String Handling-Command-Line Programming-Mathematics and Numbers-Times and Dates-Algorithms and Collection Data Types-File Formats, Encodings, and Data Persistence-File, Directory, and Process Handling	
UNIT V OBJECTORIENTED PROGRAMMING	**09**
The Object-Oriented Approach-Object-Oriented Concepts and Terminology-Custom Classes-Attributes and Methods-Inheritance and Polymorphism-Using Properties to Control Attribute Access-Creating Complete Fully Integrated Data Types-Custom Collection Classes-Creating Classes That Aggregate Collections-Creating Collection Classes Using Aggregation-Creating Collection Classes Using Inheritance	

LECTURE	**TOTAL**
45	**45**

TEXT

1. Mark Summerfield, Programming in Python-A Complete Introduction to Python Language, Second Edition, Addision Wesley, 2010.

REFERENCES

1. David M. Beazley, “Python Essential Reference” Third Edition, Sams Publishing 2006.
2. Alex Martelli, Anna Martelli Ravenscroft, and David Ascher, “Python Cookbook”, Third Edition, O’Reilly, 2002.

XCAOE7 SYSTEM AND NETWORK ADMINISTRATION

Course Outcomes:

CO1	C	Understand	***Explain*** the various System Management Principles
	P	Guided Response	**Assembles** various system components.
CO2	C	Understand	***Outline*** *the* ***c***oncept of Operating System
	P	Guided Response	***Performs*** the installation with Operating System
CO3	C	Knowledge	***Describe*** the Host and Server Management
	P	Guided Response	**Identifies** the Web Server management.
CO4	C	Understand	***Demonstrate*** the Network Management
	P	Guided Response	**Constructs t**he IP configuration and network management
CO5	C	Understand	***Describe*** the Virtualization concepts

COURSE CODE	COURSE NAME	L	T	P	C
XCAOE7	SYSTEM AND NETWORK ADMINISTRATION	3	0	0	3
C:P:A = 2: 1 : 0					
		L	T	P	H
		3	0	0	3

UNIT I SYSTEMS MANAGEMENT	**9**
Adding/Removing Hardware – Monitoring & Troubleshooting of the system– PC hardware – BIOS, Devices and Drivers – Operating Systems: Linux/Unix – Windows–history & versions	
UNIT II INSTALLING AN OPERATING SYSTEM	**9**
Windows –Linux –VMware–Boot Process – Boot Process Steps – Kernel Initialization – Hardware Configuration– Recovery Mode – Activation of Startup Scripts – Dual booting – Single User Mode – Rebooting & Shutting down– Windows: Creating users – workgroup and domain – Active Directory.	
UNIT III HOST MANAGEMENT & SERVER MANAGEMENT	**9**
Root Privileges – User Management – Disk Storage – Controlling Processes – File System Web Server (Apache & IIS) – DNS Server – Mail Server – Proxy Server	
UNIT IV NETWORK MANAGEMENT	**9**
Network Configuration – Host Name & IP configuration – Configuration of the Basic Routing and Default Gateway – Name Resolution – Dynamic Host configuration (DHCP) – Configuration of a : Linux Box as a router	
UNIT V VIRTUALIZATION	**9**
Full virtualization– Para virtualization – Native virtualization – Cloud Computing – Virtualization with Linux – Introduction to Xen	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Principles of Network and System Administration , Mark Burgess , Oslo University College, Norway Second edition 2004 , John Wiley & Sons Ltd

REFERENCES

1.The Practice of System and Network Administration, Thomas A. Limoncelli, Christina J. Hogan, Strata R. Chalup, Pearson Education, Second edition 2007

E REFERENCE

1. http://citeseerx.ist.psu.edu
2. http://almus.net/docs/System_and_Network_Administration
3. http://www.bit.lk/downloads/syllabus/sem6/IT6204_Syllabus.pdf
4. http://www.nptel.ac.in/downloads/106108101/

XCAOE8 PHP ANDMYSQL

Course Outcomes:

CO1	C	Understand	***Explain*** the basic function of PHP and uses of open sources technologies.
	P	Guided Response	***Build*** a program in PHP to implement the looping and conditional statements
CO2	C	Understand	***Explain*** the array and functions in PHP.
	P	Guided Response	***Build*** a program to implement cookies, session and file concept.
CO3	C	Knowledge	***Describe*** the various DB architectures, constraints and normalization forms.
CO4	C	Understand	***Explain*** the statements in MySQL and its effectiveness.
	P	Guided Response	***Build*** a application to construct various queries in MySQL
CO5	C	Understand	***Describe*** to implement PHP and MySQL.
	P	Guided Response	***Build*** an application to implement PHP and MySQL.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
XCAOE8	**PHP ANDMYSQL**	**3**	**0**	**0**	**3**
C:P:A = 2:1:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I INTRODUCTION TO OPEN SOURCE AND PHP — **9**

Introduction- open source-PHP – history- features-variables- statements operators- conditional statements-if-switch-nesting conditions-merging forms with conditional statements-loops-while-do-for – loop iteration with break and continue.

UNIT II ARRAY AND FUNCTIONS — **9**

Arrays: Array creation and manipulation- using array functions- creating user defined functions-using files- sessions- cookies- executing external programs- Creating sample applications using PHP.

UNIT III DATABASE MANAGEMENT SYSTEM — **9**

Components of Database systems-Definition and benefits of database-Data Independence-Three level of database architecture-Database Management System- Client server architecture -Domains-Relations-keys-Primary keys-Foreign keys-Functional dependency(Basic definition)-Normal Forms (INF, 2NF, 3NF, BCNF)-ER model – OOAD model.

UNIT IV MySQL — **9**

Effectiveness of MySQL -MySQL Tools-Prerequisites for MySQL connection- Databases and tables- MySQL data types-Creating and manipulating tables- Insertion, updation and deletion of rows in tables -Retrieving data- Sorting and filtering retrieved data -Advanced data filtering-Data manipulation functions- Aggregate functions -Grouping data- Sub queries- Joining Tables-Set operators- Full text searching

UNIT V PHP with MySQL — **9**

Working MySQL with PHP-database connectivity- usage of MYSQL commands in PHP, processing result sets of queries- handling errors-debugging and diagnostic functions- validating

user input through Database layer and Application layer- formatting query output with Character, Numeric, Date andtime –sample database applications

	LECTURE	TUTORIAL	PRACTICALS	TOTAL
	45	**0**	**0**	**45**

TEXT

1.Vikram Vaswani, PHP and MySQL, Tata McGraw-Hill, 2005
2. Ben Forta , MySQL Crash course SAMS, 2006.
3. C.J. Date, An Introduction to Database Systems, Addison Wesley, Sixth Edition.
4. Ramesh Elmasri and Shamkant B Navathe, Fundamentals of DataBase Systems,Pearson Education,Third Edition.

REFERENCES

1. Tim Converse, Joyce Park and Clark Morgan, PHP 5 and MySQL, Wiley India reprint, 2008.
2. Robert Sheldon, Geoff Moes, Beginning MySQL, Wrox, 2005

E REFERENCES

1. NPTEL, Database management systems,Dr. Arnab Bhattacharya,IIT Kanpur

Minor Courses from 2019-2020 for the programmes –BCA in the semesters-IV, V and VI
BCA –One Credit Course

1. Web Technology
2. Software Testing Tools and Practices
3. Android App Development - Mobile Technology

COURSE CODE	COURSE NAME	L	T	P	C
	WEB TECHNOLOGY	**1**	**0**	**0**	**1**
		Duration : 16Hrs			

COURSE OUTCOMES		Domain	Level
CO1	***Define** HTML tags*	Cognitive	Remember
CO2	**Set** web site hosting	Psychomotor	Set

Scope

This Workshop aims at providing industrial practices on using HTML Tagging & CSS programming Web page creation.

Day 1 : HTML TAGS & CSS PROGRAMING

Day 2 : Web Page Creation Lab Exercise

What You'll Learn

- Everything from Designing to Coding
- Creating your Own Framework

Syllabus

Page Structure Summary of HTML Visual Styling HTML-CSS-DOM Boxes, Grids and Rules Creating Files Adding Style Understanding, CSS Using Semantic Tags Positioning

Boxes Adding Images Coding, Testing, Refining Understanding Dev Tools Verifying HTML & CSS Workshop Session Profile(Lab)

Day 1 (Session 1)

Introduction of HTML

Structural Elements Of HTML, Documents HTML Editors, HTML Elements HTML Attributes, Tables In HTML Documents, Hypertext And Link In HTML Documents HTML Forms

Introduction of CSS

What Is CSS Type of CSS Styling HTML with CSS CSS Responsive

Day 1 (Session 2)

Introduction of HTML5 and CSS3

What Is HTML5 What is CSS3 Bootstrap CSS Font Awesome

Day 2 (Session 3)

Website Hosting

Choosing your Domain Name! Webhosting How to choose a web hosting provider?

Tips after you register with a hosting provider Test your website on your own PC before you go online

Day 2 (Session 4)

Using FTP Client Filezilla

Preparing to Publish your Website Folder Structure Setting Up the Options Connecting Uploading Files

Designed by:

BLUEKODE, Coimbatore

COURSE CODE	COURSE NAME	L	T	P	C
	SOFTWARE TESTING TOOLS AND PRACTICES	1	0	0	1
		Duration : 16Hrs			

COURSE OUTCOMES		Domain	Level
CO1	Use techniques, skills, and modern engineering tools to test the software under given constraints	Cognitive	Apply
CO2	Work on multidisciplinary teams of different problem domains	Cognitive	Analyze, Apply

Preamble

This course aims at providing industrial practices on using automated software testing tools determine the quality of a Software product

Prerequisite

- Software Quality and Testing
- Software Engineering Laboratory

Course Level Assessment Questions

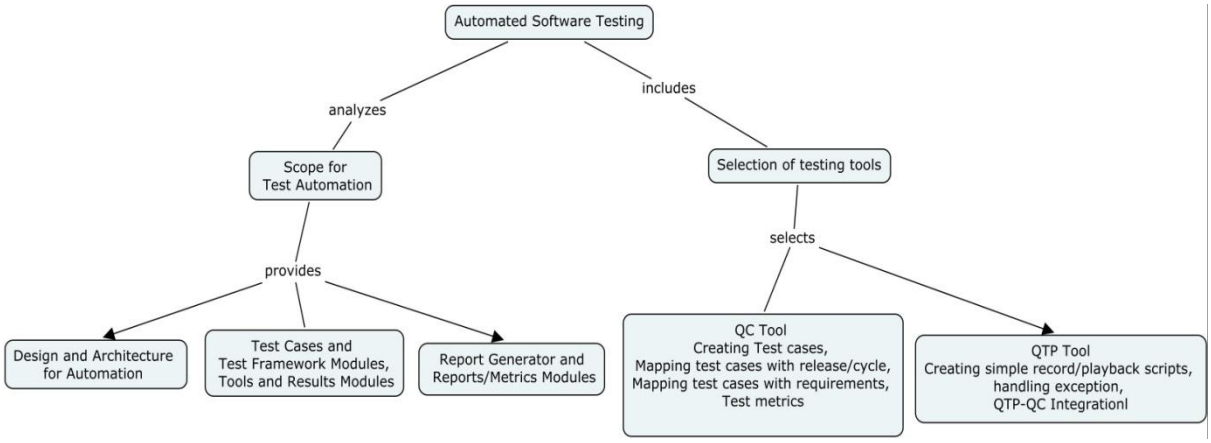
Use techniques, skills, and modern engineering tools to test the software under given constraints (CO1):

1. List the skills needed for automation.
2. What is a test case?
3. How QTP helps in generating automated test scripts?
4. Map the test cases generated using QC tool with customer stated requirements.
5. How QTP and QC results be integrated to generate a test report?

Work on multidisciplinary teams of different problem domains (CO2):

6. How automation is done for Extreme Programming Model?
7. For a medical domain having an application called ‘Online Health Care System’, devise test cases and test scripts using QTP and QC.
8. How a testing team establishes defect management activities with development team?
9. When will you use capture and playback scripts?
10. In critical online business transactions, how for automation helps in identifying vulnerable attacks by hackers and other malicious attacks?

Concept Map



Syllabus

Software Test Automation: Skills Needed for Automation- Scope of Automation : Management Aspects in Automation, Design and Architecture for Automation : Test Cases and Test Framework Modules, Tools and Results Modules- Report Generator and Reports/Metrics Modules, Generic Requirements for Test Tool/Framework : Selecting a Test Tool, Automation for Extreme Programming Model, Challenges in Automation -QTP/QC Tools**:** QC Tool: Creating Test cases, Mapping test cases with release/cycle, Mapping test cases with requirements, Test metrics, QTP Tool: Creating simple record/playback scripts, handling exception, QTP-QC Integration

Reference Books

1. Srinivasan Desikan,Gopalswamy Ramesh, "Software Testing – Principles and Practices", Pearson Education, 2nd Edition, 2007

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures
1.	**Software Test Automation**	
1.1	Scope of Automation	1
1.2	Design and Architecture for Automation	1
1.3	Automation for Extreme Programming Model, Challenges in Automation	1
1.4	Test Cases and Test Framework Modules, Report Generator and Reports/Metrics Modules, Generic Requirements for Test Tool/Framework	1
2.	**Selecting a Test Tool**	
2.1	QC Tool: Creating Test cases, Mapping test cases with release/cycle, Mapping test cases with requirements, Test metrics	3
2.2	QTP Tool: Creating simple record/playback scripts, handling exception, QTP-QC Integration	3

Course Designers:

1. From Industry
2. From Dept./University Faculty

COURSE CODE	COURSE NAME	L	T	P	C
	ANDROID APP DEVELOPMENT - MOBILE TECHNOLOGY	**1**	**0**	**0**	**1**
		Duration : 16Hrs			

COURSE OUTCOMES		Domain	Level
CO1	***Define*** *Android App architecture*	Cognitive	Remember
CO2	**Set** to develop the applications	Psychomotor	Set

Overview

Android App Development Workshop mainly focuses on how to use Android OS for building your own Android Application. Only the basic knowledge of programming is required for *Android App Development*, you do not have to be a geek for it! The workshop will start from the basics like designing layouts and building complex layouts. Once the basics of Android are done we will begin with building Apps.

The duration of this workshop will be two consecutive days, with eight hours session each day in a total of sixteen hours, properly divided into theory and hand on practical sessions. At the end of this workshop,

Workshop

Working with Eclipse IDE / Android Studio Designing of Front-End using XML Designing of Back-End using Java Develop your own Application -Use the Apps in your Android Phone Uploading Android Application to Play Store Designing of different Layout and Widget Live Projects

Day 1 (Session 1)

Introduction to the Android- world Android Architecture IO's Vs Android Scope as an Android App Developer Understanding Eclipse IDE -What is API Levels?

Understanding the Building Environment for Android

Basic programming languages intro: Java and XML What is Front-End and Back-End Environment? Designing Front-end through XML Designing Backend through JAVA Practicing various design Layouts

Understanding Layouts

What are Layouts and Widgets? Working with various layouts: Linear, Relative, Table, Frame Working with various Widgets: Text-View, Edit-Text, Buttons, Image-Views, and Scroll View etc. Practicing Layout Nesting's on various Layouts What is Weight-sum and Gravity?

Day 1 (Session 2)

Getting familiar with Activity

What are Activity and its Life-Cycle? Designing an Activity Practicing its Life-Cycle What is Manifest File Registering the Activity in Manifest File Setting up the Android Virtual Devices Testing your Hello World Application

Introduction to Intents What are Intents Types of Intents: Explicit and Implicit

Starting another Activity using both types of Intents What is Bundle? Sending Data from one Activity to another Building Camera application, fetching image using Intent

Understanding various Notifications What is Toast?

What is Dialog and Alert Dialog? What is action-bar Notification?

Day 2 (Session 3)

Developing Applications

Splash Screen Application Music Player Application SMS Application Camera Application Email Application Text-To-Speech Application

Day 2 (Session 4)

Hands on theory and practical experience

Designed by:

BLUEKODE, Coimbatore.