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PERIYAR MANIAMMAI UNIVERSITY
Under Sec. 3 of UGC Act, 1956

NAAC Accredited

SCHOOL OF COMPUTING SCIENCES AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

Master of Computer Applications (M.C.A)

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

BATCH : 2017- 2020

REGULATIONS 2017

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.

Department 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 analyse 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: Inculcating value 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**

3- Highly related 2- Medium 1– Low

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO1	The graduate will apply the fundamental concepts of computing technologies in the industry related emerging application areas.
PEO2	The graduate will be able to analyse requirement, design and implement solution for a computing Applications
PEO3	The graduate of the programme will serve as a successful computing professional and researcher by practicing modern tools and technologies.
PEO4	The graduate will be able to excel in leadership, management, communication and decision making skill to become a successful professional and entrepreneur
PEO5	The graduate will be able to practice professional ethics, pursue higher studies in computing and to work in the fields of teaching and research.

Department Mission (DM) with Programme Educational Objectives (PEOs)

	DM1	**DM2**	**DM3**	**DM4**	**DM5**
PEO1	3	2	2	2	0
PEO2	2	3	2	2	0
PEO3	2	0	3	2	1
PEO4	1	0	1	1	2
PEO5	0	1	1	2	3
Total	**8**	**6**	**9**	**9**	**6**

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

Graduates Attributes

Graduates Attributes (GAs) form a set of individually assessable outcomes that are the components indicative of the graduate's potential to acquire competence to practice at the appropriate level. The GAs are examples of the attributes expected of a graduate from an accredited programme. The computing professional Graduate Attributes of the NBA are as following:

1. **Computational Knowledge:** Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

2. **Problem Analysis:** Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

3. **Design /Development of Solutions:** Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. **Conduct Investigations of Complex Computing Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern Tool Usage:** Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

6. **Professional Ethics:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

7. **Life-long Learning:** Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

8. **Project management and finance:** Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

9. **Communication Efficacy:** Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

10. **Societal and Environmental Concern:** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.

11. **Individual and Team Work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

12. **Innovation and Entrepreneurship**: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

PROGRAMME OUTCOME (PO) AND PROGRAMME SPECIFIC OUTCOMES(PSO)

PROGRAMME OUTCOMES (POs)

PO1	To apply fundamental knowledge of Mathematics and Principles of Computing technologies in the field of computing sciences and application areas
PO2	To analyze and apply Programming principles, and computer science theory in design and development of solution.
PO3	To design algorithms, conduct experiments and interpret result to provide valid solutions for computing environment.
PO4	To investigate research related issues and apply modern application tool, and appropriate paradigm for the construction of software system.
PO5	Ability to Communicate effectively with the computing community about requirements and able to present the result clearly.
PO6	Ability to work with technical, management, leadership and entrepreneurial skills so as to deliver effective product within a time constraints
PO7	Ability to apply knowledge of professional, ethical, and security issues involving in creating software and maintaining it.
PO8	Ability to express enthusiasm for self-improvement through continuous professional development and life-long learning.

Programme Specific Outcome

PSO1	**Web Application Development:** Analyse the environment of web based application requirement and produce the interactive web site.
PSO2	**Structured Software Development Methodologies:** Apply structured methods and tools to develop effective software with necessary documents.

Mapping of Program Outcomes (POs) with Graduate Attributes (GAs)

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA 12
PO1	3	1	0	1	0	0	0	0	0	0	0	1
PO2	2	2	0	0	0	0	0	0	0	0	0	1
PO3	1	0	2	0	0	0	0	0	0	0	0	
PO4	0	2	2	2	2	0	0	2	0	0	0	0
PO5	0	0	0	0	0	0	0	0	2	1	2	0
PO6	0	0	0	0	0	0	0	0	0	0	0	2
PO7	0	0	0	0	0	3	0	0	0	0	0	0
PO8	0	0	0	0	0	0	2	0	0	0	0	0
PSO 1	2	2	1	2	2	1	2	2	2	1	1	2
PSO2	2	2	1	2	2	1	2	2	2	1	1	2

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

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

	PO1	PO2	PO3	PO4	PO5	PO 6	PO7	PO8	PSO1	PSO2	Total
PEO 1	3	3	0	0	2	0	0	0	1	1	**10**
PEO 2	1	3	3	2	2	1	1	0	2	3	**18**
PEO 3	1	0	2	3	0	0	0	0	2	3	**11**
PEO 4	2	1	1	2	2	3	0	0	2	2	**15**
PEO 5	0	0	0	0	1	1	3	1	1	1	**08**

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

MCA – MASTER OF COMPUTER APPLICATIONS

REGULATION 2017

SEMESTER-I

Course Code	Course Name	L	T	P	H	C
YCA101	Mathematical Foundations of Computer Science	4	0	0	4	4
YCA102	Human Ethics, Values, Rights and Gender Equality	3	0	0	3	3
YCA103	Programming and Data Structures using C++	4	0	4	8	6
YCA104	Computer Organization and Architecture	4	0	0	4	4
YCA105	Database Management Systems	4	0	4	8	6
	Total	**19**	**0**	**8**	**27**	**23**

SEMESTER II

Course Code	Course Name	L	T	P	H	C
YCA201	Resource Management Techniques	4	0	0	4	4
YCA202	Advanced Operating Systems	4	0	4	8	6
YCA203	Visual Programming	4	0	4	8	6
YCA204	Design and Analysis of Algorithms	4	0	0	4	4
YCAE**	Elective – I	3	0	0	3	3
	Total	**19**	**0**	**8**	**27**	**23**

SEMESTER- III

Course Code	Course Name	L	T	P	H	C
YCA301	Object Oriented Software Engineering	4	0	0	4	4
YCA302	Advanced JAVA Programming	4	0	4	8	6
YCA303	Data Communication and Networking	3	0	0	3	3
YCA304	Information Security	3	0	0	3	3
YCA305	Unix and Network Programming	3	0	4	7	5
YCA***	Skill Based Elective – I	1	0	2	3	2
YCA310	In Plant Training	--	--	--	--	2
	Minor Course - Virtualization Techniques	0	0	0	16	1
	Total	**18**	**0**	**10**	**28**	**23+2**

SEMESTER- IV

Course Code	Course Name	L	T	P	H	C
YCA401	Computer Graphics and Multimedia Systems	4	0	4	8	6
YCA402	.NET Technologies	3	0	4	7	5
YCA403	Software Quality Assurance and Testing	3	0	0	3	3
YCA404	Data Mining and Data Warehousing	4	0	4	8	6
YCAE**	Elective – II	3	0	0	3	3
YCA406	Minor Course - Cloud Storage Technology and Security	0	0	0	16	1
	Total	**17**	**0**	**12**	**29**	**23**

SEMESTER- V

Course Code	Course Name	L	T	P	H	C
YCA501	Mobile Application Development	4	0	4	8	6
YCA502	Software Project Management	4	0	4	8	6
YCA503	Entrepreneurship Development	3	0	0	3	3
YCAE**	Elective III	3	0	0	3	3
YCAE**	Elective IV	3	0	0	3	3
YCA***	Skill Based Elective – II	1	0	2	3	2
YCA510	In Plant Training	-	-	-	-	3
YCA507	Minor Course- Advanced Database Technology	0	0	0	16	1
	Total	**18**	**0**	**10**	**28**	**26**

SEMESTER-VI

Course Code	Course Name	L	T	P	H	C
	Project					
YCA601	Project Work	0	0	24	24	12

ELECTIVES – I

Course Code	Course Name	L	T	P	C
YCAE21	Accounting and Financial Management	3	0	0	3
YCAE22	Database Administration	3	0	0	3
YCAE23	Advanced Computer Architecture	3	0	0	3
YCAE24	Enterprise Resource Planning	3	0	0	3

ELECTIVE II

Course Code	Course Name	L	T	P	C
YCAE41	Image Processing and Computer Vision	3	0	0	3
YCAE42	Internet Protocols	3	0	0	3
YCAE43	Web Application Development	3	0	0	3
YCAE44	Parallel and Distributed Computing	3	0	0	3

ELECTIVES – III

Course Code	Course Name	L	T	P	C
YCAE51	Cloud Computing	3	0	0	3
YCAE52	Service Oriented Architecture	3	0	0	3
YCAE53	Pervasive Computing	3	0	0	3
YCAE54	Bigdata Analytics	3	0	0	3

ELECTIVE IV

Course Code	Course Name	L	T	P	C
YCAE55	Mobile Computing	3	0	0	3
YCAE56	Network Administration	3	0	0	3
YCAE57	Social Network Analysis	3	0	0	3
YCAE58	Artificial Intelligence and Expert Systems	3	0	0	3

SKILL BASED ELECTIVE - I

Code Code	Course Name	L	T	P	C
YCAS31	Personality Development and Soft Skill	1	0	2	2
YCAS32	Data Analytics with worksheet	1	0	2	2

SKILL BASED ELECTIVE - II

Code Code	Course Name	L	T	P	C
YCAS51	Quantitative Aptitude	1	0	2	2
YCAS52	Programming with PHP and MySQL	1	0	2	2

Course structure

Course/Semester	**Sem I**	**Sem II**	**Sem III**	**Sem IV**	**Sem V**	**Sem VI**	**Total Credits**
Mathematics	4	4					**8**
Human Ethics	3						**3**
Core Theory	12	12	17	14	11		**66**
Core Lab	4	4	4	6	4		**22**
Skill Based Elective			2		2		**4**
Elective		3	-	3	6		**12**
In plant Training			2		3		**5**
Project						12	**12**
Total Credits	**23**	**23**	**25**	**23**	**26**	**12**	132

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YCA 101 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Course Outcomes:

CO1	C	Knowledge	***Describe*** various methods to define Logic and Predicate calculus
CO2	C	Understand	***Understand*** and apply set theory and Relations
CO3	C	Knowledge	***Describe*** and ***apply*** various counting and inclusion theory
CO4	C	Understand	***Describe*** and ***solve*** problems in graph theory
CO5	C	Understand	***Understand*** Finite state Automata

COURSE CODE	COURSE NAME	L	T	P	C
YCA 101	MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE	4	0	0	4
C:P:A = 4:0:0					
		L	T	P	H
		4	0	0	4

UNIT I MATHEMATICAL LOGIC — **12**

Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Theory of inference for the statement calculus Rules of inference, Consistency of premises and indirect method of proof. Predicate calculus: Predicates, statement functions, variables and quantifiers, predicate formulas, free and bound variables, universe of discourse, inference theory of predicate calculus.

UNIT II SET THEORY AND RELATIONS — **12**

Introduction, Relations and ordering, Properties of binary Relations, Equivalence, Compatibility Relations, Partial ordering, Hasse diagram. Functions: composition of functions, Inverse Function, Recursive Functions, Lattice and its Properties, Pigeon hole Principles and its application

UNIT III ELEMENTARY COMBINATORICS — **12**

Basis of counting, Enumeration of Combinations & Permutations, Enumerating of Combinations and Permutations with repetitions and constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, principles of Inclusion – Exclusion.

UNIT IV GRAPH THEORY — **12**

Representation of Graph, Spanning Trees, BFS, DFS, Kruskals Algorithm, Binary trees, Planar Graphs , Isomorphism and Sub graphs, Multi graphs and Euler circuits

UNIT V FINITE STATE AUTOMATA — **12**

Finite State Automata-Deterministic Finite State Automata (DFA), Non Deterministic Finite State Automata (NFA) – Equivalence of DFA and NFA and Regular Languages

	LECTURE	TUTORIAL	TOTAL
	60	0	60

TEXT

1. Discrete Mathematical Structures with Applications to computer science, J.P Tremblery, R.Manohar, TMH
2. Discrete Mathematical for computer Scientists & Mathematicians, J.L. Molt, A.Kandel, T.P.Baker, PHI

REFERENCES

1. Discrete Mathematics and its Applications, Kenneth H. Rosen, Tata McGraw-Hill

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	2	1	1	1						
CO 2	2	1	1	1						
CO 3	2	2	1	1						
CO 4	2	2	1	1						
CO 5	1	2	1	1						
Total	11	8	5	5						
Course	3	2	1	1						

YCA 102 HUMAN ETHICS, VALUES, RIGHTS AND GENDER EQUALITY

Course Outcomes:

CO1	C	Remember	***Relate*** and ***Interpret*** the human ethics and human relationships
CO2	C	Understand Apply	***Explain*** and ***Apply*** gender issues, equality and violence against women
CO3	C A	Analyse Receiving	***Classify*** and ***Develop*** the identify of human rights and their violations
CO4	C	Understand Analyse	***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
YCA 102	HUMAN ETHICS, VALUES, RIGHTS AND GENDER EQUALITY	3	0	0	3
C:P:A 1.8:0:0.2		L	T	P	H
		3	0	0	3

UNIT I HUMAN ETHICS AND VALUES **09**

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, Valuing Time, Co-operation, Commitment, Sympathy and Empathy, Self respect, Self-Confidence and Personality- Living in harmony at various levels.

UNIT II GENDER EQUALITY **09**

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

UNIT III WOMEN ISSUES AND CHALLENGES **09**

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 **09**

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.

UNIT V GOOD GOVERNANCE AND ADDRESSING SOCIAL ISSUES **09**

Good Governance - Democracy, People's Participation, Open and Transparence governance, Corruption, Impact of corruption on society, on how and whom to make corruption complaints, fight against corruption and related issues and character building, Fairness in criminal justice administration, Government system of Redressal. Issues and intervention in situations of family violence, substance abuse and corruption. Creation of People friendly environment and universal brotherhood.

	LECTURE	TOTAL
	45	45

REFERENCES

1. Aftab A, (Ed.), Human Rights in India: Issues and Challenges, (New Delhi: Raj Publications, 2012).
2. Bajwa, G.S. and Bajwa, D.K. Human Rights in India: Implementation and Violations (New Delhi: D.K. Publications, 1996).
3. Chatrath, K. J. S., (ed.), Education for Human Rights and Democracy (Shimala: Indian Institute of Advanced Studies, 1998).
4. Jagadeesan. P. Marriage and Social legislations in Tamil Nadu, Chennai: Elachiapen Publications, 1990).
5. Kaushal, Rachna, Women and Human Rights in India (New Delhi: Kaveri Books, 2000)
6. Mani. V. S., Human Rights in India: An Overview (New Delhi: Institute for the World Congress on Human Rights, 1998).
7. Singh, B. P. Sehgal, (ed) Human Rights in India: Problems and Perspectives (New Delhi: Deep and Deep, 1999).
8. Veeramani, K. (ed) Periyar on Women Right, (Chennai: Emerald Publishers, 1996)
9. Veeramani, K. (ed) Periyar Feminism, (Periyar Maniammai University, Vallam, Thanjavur: 2010).

11.Planning Commission report on Occupational Health and Safety http://planningcommission.nic.in/aboutus/committee/wrkgrp12/wg_occup_safety.p

11. Central Vigilance Commission (Gov. of India) website: http://cvc.nic.in/welcome.html.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1					1		2			
CO 2					1	1	2			
CO 3					1		2			
CO 4					1		3			
CO 5					1	1	3			
Total					5	2	12			
Course					1	1	3			

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

YCA 103 PROGRAMMING AND DATA STRUCTURES USING C++

Course Outcomes:

CO1	C P	Knowledge, Apply	***Knowledge*** on OOPs programming fundamentals, ***Recognize*** Various statements in C++
CO2	C	Understand	***Knowledge*** on OOPs concepts
CO3	C P	Understand, Apply	***Apply*** and ***implement*** Linear data structure operations, ***Implement*** the program
CO4	C P	Understand, Apply	***Apply*** and ***Implement*** various types of trees and their operations, ***Recognize*** the operations on tree structures using C++
CO5	C	Understand	***Understand*** Graph and its operations

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA 103	**PROGRAMMING AND DATA STRUCTURES USING C++**	**4**	**0**	**2**	**6**
C:P:A = 4:2:0					
		L	**T**	**P**	**H**
		4	**0**	**4**	**8**

UNIT I INTRODUCTION **12+30**

S/W Evolution - Features Of Procedure Oriented Programming- Basic Concepts Of Oops- Benefits Of Oops - Applications Of Oops – Tokens – Expressions - Data Types – Variables - Storage Class Specifiers-Constants-Operators-Control Structures-Arrays-Pointers.

Lab:

1. Generate the following series of numbers:
   i. Armstrong numbers between 100 to 1000
   ii. Prime numbers between 1 and 100
   iii. Fibonacci series up to N numbers
2. Manipulate the strings with following operations.
   i. Concatenating two strings, ii. Reversing the string, iii. Finding the sub-string
   iv. Replacing a string, v. Finding the length of a string
3. Find the summation of the following series:
   i. Sine, ii. Cosine, iii. Exponential
4. Simulate following Banking operations using functions.
   i. Deposit, ii. Withdrawal, iii. Balance Enquiry
5. Implement using recursion
   i. Find the solution of Towers of Hanoi problem using recursion.
   ii. Fibonacci number generation.
6. Create a collection of books using arrays of structures and do the following:
   i. Search a book with title and author name, ii. Sorts the books on title.

UNIT II OOPS **12+5**

Class And Objects-Functions-Friend Function-Inline Function-Constructors: Types - Overloading Constructor-Destructors--Inheritance-Types- Polymorphism: Function Overloading-Operator Overloading (Unary And Binary)-Virtual Functions-Console I/O-Files-Exception Handling.

Lab:

1. Class

Implementation of Class-Constructor-Destructor-Friend class – Friend functions - Static member function.

UNIT III LINEAR DATA STRUCTURE **12+5**

Definition-Stack: Operation-Applications:-Infix To Postfix And Prefix Conversion-Evaluation Of Postfix Expression-Tower Of Hanoi-Queue: Operations-Types-Applications – List: Single Linked List-Double Linked List-Circular Linked List. Sorting: Bubble Sort-Insertion Sort- Selection Sort-Quick Sort-Radix Sort-Merge Sort. Searching: Linear Search – Binary Search.

Lab:

1. Implement the operations on singly linked list.

UNIT IV TREES **12+15**

Basic Terminologies-Binary Trees: Representation-Traversal-Reconstruction-Binary Search Trees-Forest-Conversion Of Binary Trees Into Forest-Threaded Binary Trees-B Trees-Avl Trees-Red Black Trees-Heap Tree-Hashing –Hash Functions.

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. Binary tree traversals

UNIT V GRAPHS **12+5**

Basic Terminologies-Representation-Types-Traversal-Minimum Spanning Tree: Kruskul's Algorithm-Prim's Algorithm-Shortest Path: Dijkstra's Algorithm.

Lab:

1. Sorting the numbers : (i) Heap (ii) Quick

	LECTURE	PRACTICAL	TUTORIAL	TOTAL
	60	60	0	120

TEXT

1. Herbert Schildt, The complete reference,Tata Mcgraw Hill Publications,3rd edition.
2. E.Balagurusamy, Object Oriented Programming with C++, McGraw Hill Publications 4th edition.
3. E.Horowitz S. Sahani and Mehta, Fundamentals of Data Structures in C++, Galgotia Publications, New Delhi.
4. Data Structures using C, ISRD groups, Tata Mc-Graw Hill Publications.
5. Samanta, Classic Data Structures, Prentice Hall of India,2009
6. Seymour Lipschitz, Data Structures,Tata McGraw Hill Publications

REFERENCES

1. Bjarne Stroustrup, C++ programming languages, Pearson education.3rd edition.
2. Introduction to Problem Solving and Programming by D. Gupta, IIT Kanpur

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	2	1	1							
CO 2	2		1	1						
CO 3	2		1		1					
CO 4	2				1					2
CO 5	2	1	1		1					2
Total	10	2	4	1	3					4
Course	3	1	1	1	1					1

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

YCA 104 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**
YCA 104	**COMPUTER ORGANIZATION AND ARCHITECTURE**	**4**	**0**	**0**	**4**
C:P:A = 4:0:0					
		L	**T**	**P**	**H**
		4	**0**	**0**	**4**

UNIT I BASICS OF LOGIC DESIGN **12**

Introduction: Simple Computer Organization - Number System – Data Representation – Boolean Algebra – Logic Gates - Map Simplification – K Map - Introduction To Sequential Circuits And Combinational Circuits.

UNIT II DIGITAL COMPONENTS **12**

Adders – Subtractors – Decoders – Multiplexer – Flip Flops: RS, JK, D, T Flip Flops – Excitation Table – Master / Slave Flip Flop- Registers – Counters – Memory Unit – Micro Operations

UNIT III BASIC COMPUTER ORGANISATION AND DESIGN **12**

General Register Organization – Instruction Format – Instruction Type - Timing And Control – Addressing Modes – Memory Reference Instructions – Data Transfer And Manipulation – Computer Arithmetic - Design Of ALU – Design Of Control Unit.

UNIT IV ARCHITECTURE AND MODE OF TRANSFER **12**

Introduction To Loosely Coupled And Tightly Coupled Computer Architecture - RISC – CISC Pipelining – Vector Processing – Array Processors – Peripheral Devices – Input Interface – Asynchronous Data Transfer – Modes Of Transfer – Addressing Modes- Priority Interrupt – DMA – I / O Processor.

UNIT V MEMORY HIERARCHY **12**

Memory Hierarchy – Main Memory - Paging And Segmentation – Auxiliary Memory – Cache – Virtual Memory – Memory Management Hardware – Multiprocessor Interconnection Structures

LECTURE	**TUTORIAL**	**TOTAL**
60	**0**	**60**

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	PO8	PSO 1	PSO 2
CO 1	1	1								1
CO 2	1	2		1				1		1
CO 3	2	1								
CO 4	1	1						1		
CO 5	2	1		1						1
Total	7	6		2				2		3
Course	2	2		1				1		1

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

YCA105 DATABASE MANAGEMENT SYSTEMS

Course Outcomes:

CO1	C	Knowledge	***Describe*** the database architecture and its applications
	C	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
	C	Knowledge	***Describe*** the Normalization forms
	P	Guided Response	***Construct*** various queries in SQL and PL/SQL
	A	Respond	***Compiles*** various queries in SQL, Relational Calculus and algebra
	A	Respond	***Practices*** a table and implements the normalization concept
CO3	C	Understand	***Explain*** the storage and accessing of data.
CO4	C	Understand	***Illustrate*** the query processing in database management
CO5	C	Knowledge	***Define*** the transaction management, concurrency control and deadlock concept

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA105	**DATABASE MANAGEMENT SYSTEMS**	**4**	**0**	**2**	**6**
C:P:A = 4:1.5:0.5					
		L	**T**	**P**	**H**
		4	**0**	**4**	**8**

UNIT I DATABASE ARCHITECTURE AND ER DIAGRAM **12**

Database Systems vs File Systems – View of Data – Data Models – Database Languages – Transaction Management – Database Systems Structure – History of Database Systems – Database Systems Applications – Entity Relationship Model.

UNIT II RELATIONAL DATA MODEL AND DATA NORMALIZATION **12+60**

Algebra and Calculus – SQL: DDL - Basic Structure- Set Operations – Aggregate Functions – Null Values – Nested Queries – Views – Complex Queries –Join Relation – Modification of Databases – Embedded SQL – Dynamic SQL –Other SQL Functions – Integrity and Security – Relational Database Design.

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 STORAGE AND FILE ORGANIZATION **12**

Storage and File Structure: Overview – Magnetic Disks - Raid -Tertiary Storage - Storage Access -File Organization – Organization of Files - Data Dictionary Storage – Indexing and Hashing : B+ Tree – B-Tree Index Files- Static Hashing.

UNIT IV QUERY PROCESSING	12
Query Processing: Overview - Measure of Query Cost - Selection Operation – Sorting - Join Operation - Evaluation of Expressions - Query Optimization.	
UNITV TRANSACTION MANAGEMENT	**12**
Transactions: Concept – States – Concurrent Executions – Serializability - Recoverability – Implementation of Isolation – Transaction in SQL – Testing for Serializability - Concurrency Control: Protocols – Deadlock Handling – Recovery Systems: Failure Classification - Storage Structure – Recovery and Atomicity –Log Based Recovery- Shadow Paging - Recovery with Concurrent Transactions – Buffer Management – Case Studies – Oracle – Microsoft SQL Server-XML.	

	LECTURE	TUTORIAL	PRACTICALS	TOTAL
	60	0	60	120

TEXT

1. Abraham Silberschatz, Henry Korth, S.Sudarshan, Database Systems Concepts, Sixth Edition, McGraw Hill, 2010.
2. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Pearson Education, 2011

REFERENCES

1. Bipin Desai, An Introduction to database systems, Galgotia Publications, 2010.
2. Raghu Ramakrishnan and Johannes Gehrke, Database management systems, Third Edition,2002

E REFERENCES

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO 1	PSO 2
CO 1	3	2	1				1	1		2
CO 2	2	1	2	1	1		2	1	2	2
CO 3	2	1	1	1	1		1	1		1
CO 4	2	1	1				1	1	2	
CO 5	2	1	1			1	1	2	2	1
Total	11	6	6	2	2	1	6	6	6	6
Course	3	2	2	1	1	1	2	2	2	2

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

YCA 201 RESOURCE MANAGEMENT TECHNIQUES

Course Outcomes:

CO1	C	Knowledge	***Describe*** various Linear Programming and solutions
CO2	P	Undrstand	***Understand*** and apply transportation problems and models
CO3	C	Knowledge	***Describe*** and ***apply*** various queuing models
CO4	A	Undrstand	***Describe*** and ***solve*** Integer programming problems
CO5	C	Undrstand	***Understand*** PERT/CPM and cost estimation

COURSE CODE	COURSE NAME	L	T	P	C
YCA 201	RESOURCE MANAGEMENT TECHNIQUES	4	0	0	4
C:P:A = 4:0:0					
		L	T	P	H
		4	0	0	4

UNIT I LINEAR PROGRAMMING — **12**

Linear programming introduction – Formulation of LP models – Graphical solution – Algebraic solutions – Simplex method – Feasibility – Optimality – Artificial variables – M-Technique.

UNIT II TRANSPORTAION MODEL AND ASSIGNMENT MODEL — **12**

Mathematical model of Transportation Problem – Methods of finding initial solution-Test for optimality – Variance in Transportation Problem- Assignment Problem.

UNIT III QUEUING MODELS — **12**

Introduction – Deterministic model – Queue parameters – M/M/1 Queue – Limited Queue capacity – Multiple Servers – Finite sources – waiting Times – Queue disciplines – Non-Markovian Queue – Probabilistic models.

UNIT IV INTEGER PROGRAMMING PROBLEM — **12**

Types of Integer Programming Problems – Gomory's Mixed Integer cutting plane method-Branch and Bound Method – Applications of Zero-One Integer Programming.

UNIT V PERT / CPM — **12**

Arrow (network) diagram representations – Time estimates – critical path Floats – Contraction of Time chart and Resource Levelling – Probability and Cost considerations in project scheduling – project control.

LECTURE	TUTORIAL	TOTAL
60	0	60

TEXT

1. Sharma, J.K., "Operations Research: Theory and Applications", Macmillan India Ltd., THIRD Edition, 2011.
2. Hamdy A.Taha, "Operations Research – An Introduction", 7th Edition, Prentice Hall of India, 2009.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	2	1	1	1						
CO 2	2	1	1	1						
CO 3	2	2	1	1						
CO 4	2	2	1	1						
CO 5	1	2	1	1						
Total	11	8	5	5						
Course	3	2	1	1						

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

YCA202 ADVANCED OPERATING SYSTEMS

Course Outcomes:

CO1	C	Understand	***Explain*** the operating system functions
CO2	C	Understand	***Implement*** the process and various process scheduling algorithms
		Apply	
	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	Understand	***Describe*** deadlock and various procedures to avoid the deadlock.
	A	Organize	***Integrates*** different memory management techniques.
	P	Adapt	***Apply*** the fixed size and variable size page replacement algorithm.
CO5	C	Understand	***Implement*** and ***understand*** the file organization.

COURSE CODE	COURSE NAME	L	T	P	C
YCA202	**ADVANCED OPERATING SYSTEMS**	**4**	**0**	**2**	**6**
C:P:A = 4:1.5:0.5					
		L	**T**	**P**	**H**
		4	**0**	**4**	**8**

UNIT I INTRODUCTION **12**

Introduction: Definition of OS - OS Structure – OS Operations – Types of systems - OS Services – System Calls – Types of System Calls –Operating System Design and Implementation – System Boot.

UNIT II PROCESS MANAGEMENT & COORDINATION **12+28 = 40**

Process Concept: Overview – Process Scheduling – Operations on Processes – Interprocess Communication.

Process Scheduling: Basic Concepts – Scheduling criteria- Scheduling algorithm.

Synchronization Critical-Section problem - Synchronization hardware - Semaphore-Classic Problems of Synchronization

Deadlocks: System Model - Deadlock Characterization - Methods for Handling Deadlocks - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection.

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.
5. Simulate MVT and MFT
6. Simulate Bankers algorithm for Deadlock Avoidance
7. Simulate Bankers Algorithm for deadlock Prevention

UNIT III MEMORY MANAGEMENT **12 + 8 = 20**

Functions of memory management - Swapping- Contiguous Memory Allocation- Fixed partition-Variable partition- swapping - Paging- Structure of the Page Table-Segmentation - Demand Paging - Page Replacement methods- Allocation of Frames – Thrashing – Memory Mapped Files.

Lab :

1. Simulate FIFO Page Replacement Algorithms
2. Simulate LRU Page Replacement Algorithms

UNIT IV STORAGE MANAGEMENT	12 + 8 = 20

File System: File Concept - Access Methods - Directory Structure – File System mounting – File Sharing - Protection.

Secondary Storage Structure – Overview - Disk Structure – Disk Attachment - Disk Scheduling – Disk Management – Swap Space Management. **I/O Systems:** Kernel I/O Subsystem – Transforming I/O Requests to Hardware Operations – Streams – Performance.

Lab :

1. Simulate Optimal Page Replacement Algorithms
2. Simulate Paging Technique of Memory Management

UNIT V SYTSTEM PROTECTION	12 + 16 = 28

System Protection: Goals of Protection- Principles of Protection – Domain of Protection – Access Control – Revocation of Access Rights.

Lab :

1. Create the directory tree in your home directory namely "man", which explains the steps to create home directory
2. Write a C program to provide access rights for a file
3. Write a C Program to protect the files/folders

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	60	0	60	120

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).
3. H M Deital, P J Deital and D R Choffnes, "Operating Systems" ,3rd edition, Pearson Education, 2011.
4. D M Dhamdhere, Operating Systems: A Concept-based Approach, Second Edition, Tata McGraw-Hill Education, 2007.

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

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

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

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

YCA 203 VISUAL PROGRAMMING

Course Outcomes:

CO1	C	Knowledge	***Understand*** basic controls and events in VB
CO2	C	Understand Apply	***Understand*** and ***Implement various*** Visual Basic constructs with events and controls
CO3	C	Understand Apply	***Describe*** and ***apply*** the concepts in C#
	P	Adapt	***Recognize*** Different applications in C#
CO4	C	Understand Apply	***Understand*** and ***implement*** operations in .Net
	P	Originate	Constructs and implement OOPs concepts in .Net
CO5	C	Understand Apply	***Understand*** and ***Implement*** various .Net frameworks

COURSE CODE	COURSE NAME	L	T	P	C
YCA 203	VISUAL PROGRAMMING	4	0	2	6
C:P:A = 4:2:0					
		L	T	P	H
		4	0	4	8

UNIT I VB PROGRAMMING FUNDAMENTALS — **12 +4**

User Interface: Forms – Intrinsic controls – Properties, Methods and Events – Programming Fundamentals: Variables – Data Types - Constants –Arrays - Built-in Functions – Control Structures: Decision – Looping – Select Case.

Lab:

1. Program using static and dynamic controls
   Test box, button, combo box, list box, radio button, check box, progress control, list control, tree control, image list, tab control.

UNIT II ADVANCED CONTROLS AND DATABASES — **12+8**

Menu bar - Tool bar - Message box - Input box - Dialog box - MDI – Tree view – List view – Tab strib - Basic File Handling : File handling Functions – File System Controls : File List Box – Directory List Box – Drive List Box - Data Control – DAO – Manipulation of records – Database management with ODBC - Data Grid Control – Database Applications .

Lab:

1. Program to interface with database
2. Program using extrinsic controls and reports
   MS Flex grid, Crystal Report

UNIT III INTRODUCTION TO C# — **12+32**

Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations, Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

Lab:

1. Programs to implement Branching, Looping structure in C#
2. Programs to implement Methods, Arrays, Strings in C#

3. Programs to implement Structures, Enumerations . in C#
4. Programs to implement Inheritance in C#
5. Programs to implement Polymorphism in C#
6. Programs to implement Interfaces in C#
7. Programs to implement Operator overloading in C#
8. Programs to implement Delegates, Events, Errors and Exceptions in C#

UNIT IV APPLICATION DEVELOPMENT ON .NET **12+8**

Building Windows Applications, Accessing Data with ADO.NET, Programming Web Applications with Web Forms, Programming Web Services.

Lab:

1. Program to Build an Calculator widget
2. Programs to implement Multi Module Assembly

UNIT V THE CLR AND THE .NET FRAMEWORK **12+8**

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

Lab:

1. Develop an application in .Net framework.
2. Programs for Web applications.

	LECTURE	PRACTICAL	TUTORIAL	TOTAL
	60	60	0	120

TEXT

1. E. Balagurusamy, Programming in C#, Tata McGraw-Hill, 2004.

REFERENCES

1. Art Gittleman, Computing with C# and the .NET Framework , J&B Learning,2011
2. Herbert Schildt, The Complete Reference: C#, Tata McGraw-Hill, 2004.
3. Robinson et al, Professional C#, 2nd ed., Wrox Press, 2002.
4. Andrew Troelsen, C# and the .NET Platform, A! Press, 2003.
5. S. Thamarai Selvi, R. Murugesan, A Textbook on C#, Pearson Education,2003.
6. Gary Carnell, Visual Basic 6 from Ground Up, Tata McGraw-Hill, 1999.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	2	1	1							
CO 2	2		1	1						
CO 3	2	1	1							
CO 4	2			1	1	1			2	1
CO 5	2					1			2	1
Total	10	2	3	2	1	2			4	2
Course	3	2	1	1	1	1			1	1

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

YCA 204 DESIGN AND ANALYSIS OF ALGORITHMS

Course Outcomes:

CO1	U	Understand	***Explain*** the various notations for analyse time, space complexity of an algorithm
CO2	U	Understand	***Illustrate*** the ***c***oncept of divide and conquer
CO3	K	Knowledge	***Analyse*** various problem using the algorithmic technique, Greedy Method
CO4	K	Knowledge	***Analyse*** various problem using Dynamic Programming and Backtracking.
CO5	U	Understand	***Describe*** various traversal methods and graphs

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA204	**DESIGN AND ANALYSIS OF ALGORITHMS**	**4**	**0**	**0**	**4**
C:P:A 4:0:0					
		L	**T**	**P**	**H**
		4	**0**	**0**	**4**

UNIT I INTRODUCTION TO ALGORITHM **12**

Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types – Fundamentals of the Analysis of Algorithm Efficiency – Analysis Framework – Asymptotic Notations and its properties – Mathematical analysis for Recursive and Non-recursive algorithms.

UNIT II BRUTE FORCE AND DIVIDE-AND-CONQUER **12**

Brute Force – Closest-Pair and – Traveling Salesman Problem – Knapsack Problem – Assignment problem. Divide and conquer methodology – Merge sort – Quick sort – Binary search-Multiplication of Large Integers – Strassen's Matrix Multiplication

UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE **12**

Computing a Binomial Coefficient – Warshall's and Floyd' algorithm – Optimal Binary Search Trees – Knapsack Problem and Memory functions. Greedy Technique– Prim's algorithm- Kruskal's Algorithm- Dijkstra's Algorithm-Huffman Trees.

UNIT IV ITERATIVE IMPROVEMENT **12**

The Simplex Method-The Maximum-Flow Problem – Maximum Matching in Bipartite Graphs- The Stable marriage Problem.

UNIT V BACKTRCKING, AND BRANCH AND BOUND **12**

NP and NP-Complete Problems–Coping with the Limitations – Backtracking – n-Queens problem – Hamiltonian Circuit Problem – Subset Sum Problem-Branch and Bound – Assignment problem – Knapsack Problem – Traveling Salesman Problem- Approximation Algorithms for NP – Hard Problems – Traveling Salesman problem – Knapsack problem

LECTURE	**TUTORIAL**	**TOTAL**
60	**-**	**60**

TEXT

1. Anany Levitin, Introduction to the Design and Analysis of Algorithms, Third Edition, Pearson Education, 2012.

REFERENCES

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, Introduction to Algorithms, Third Edition, PHI Learning Private Limited, 2012.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures and Algorithms, Pearson Education, Reprint 2006.

3. Donald E. Knuth, The Art of Computer Programming, Volumes 1& 3 Pearson Education, 2009.
4. Steven S. Skiena, The Algorithm Design Manual, Second Edition, Springer, 2008.

E REFERENCES:

https://onlinecourses.nptel.ac.in/noc15_cs02/preview

NPTEL :http://nptel.ac.in/courses/106106131/

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2	0	2	1	2	1	1	3	0
CO 2	3	1	0	2	1	2	1	1	3	1
CO 3	3	2	0	2	1	1	1	1	3	1
CO 4	3	2	0	2	1	2	1	1	3	0
CO 5	3	2	0	2	1	2	1	1	3	1
Total	15	9	0	10	5	9	5	5	15	3
Course	3	2	0	2	1	2	1	1	3	1

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

YCA301 OBJECT ORIENTED SOFTWARE ENGINEERING

Course Outcomes:

C01	C	Understand	***Explain*** the system development and object oriented concepts.
C02	C	Understand	***Illustrate*** the UML diagram for various real world applications.
C03	C	Knowledge	***Describe*** the design models and user interface design.
C04	C	Understand	***Derive*** the test case for various testing methods
	C	Understand	***Illustrate*** the test case for various testing methods
C05	C	Understand	***Summarize*** the software management, metrics and Software Quality

COURSE CODE	COURSE NAME	L	T	P	C
YCA301	OBJECT ORIENTED SOFTWARE ENGINEERING	4	0	0	4
C:P:A = 4:0:0					
		L	T	P	H
		4	0	0	4

UNIT I SOFTWARE ENGINEERING CONCEPTS — **12**

The System life cycle: Introduction – System Development as a Process of Change – System Development and Reuse – Methodology - Object-Oriented System Development: Introduction – Function/Data Methods – Object-Oriented Analysis – Object-Oriented Construction – Object-Oriented Testing.

UNIT II MODELLING WITH UML — **12**

Introduction – An Overview – Modelling Concepts – A Deeper View into UML: Use Case Diagram – Class Diagram – Interaction Diagram – State/Chart Diagram – Activity Diagram – Diagram Organization - System Development is Model Building - The Requirements Model – The Analysis Model

UNIT III CONSTRUCTION — **12**

Introduction – The Design Model – Blocks Design – Working with Construction – User Interface Design - Object DBMS- Components – Use of Component

UNIT IV TESTING — **12**

Introduction – Testing Concepts – Testing Activities: Component Inspection – Usability Testing – Integration Testing – System Testing –Planning Testing - Documentation Testing – Regression Testing – Automation Testing. Case Study: Warehouse Management System.

UNIT V MANAGING OBJECT-ORIENTED SOFTWARE ENGINEERING — **12**

Introduction – Project Selection – Product Development Organization –Project Organization And Management – Project Staffing – Software Quality Assurance – Software Metrics – Software Configuration Management.

LECTURE	TUTORIAL	TOTAL
60	0	60

TEXT

1. Ivar Jacobson & others, Object-oriented software engineering, Pearson Education, 1992.
2. Bernd Bruegge, Allen H. Dutoit, Object-oriented Software Engineering, Pearson Education, Second Edition, 2004.

REFERENCES

1. Grady Booch & others, Object-oriented Analysis and Design with Applications, Pearson Education,Third Edition, 2010
2. Stephen R.Schach, Object-oriented and Classical Software Engineering, Tata

McGraw-Hill,Fifth Edition, 2002
3. Yogesh Singh, Ruchika Malhotra, Object-Oriented Software Engineering, PHI, Edition 2012.
4. Ali Bahrami, Object Oriented System Development, McGraw-Hill International, 1999.

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	PO8	PSO 1	PSO 2
CO 1	3	1						1	1	
CO 2	2	2	1		1	1	1	2	1	
CO 3	2	2	1			1	1	1	2	1
CO 4	2	2	1		1			1	2	1
CO 5	2	1					1	1	1	1
Total	11	8	3	0	2	2	3	6	7	3
Course	3	2	1	0	1	1	1	2	2	1

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

YCA302 ADVANCED JAVA PROGRAMMING

Course Outcomes:

CO1	C	Knowledge	***Describe*** and ***implement*** the class, packages and interfaces
	P	Set	***Participating*** in creating packages, interfaces, multithreading and event handling methods
CO2	C	Understand, Apply	***Describe*** and ***implement*** the networking and data base connectivity
	P	Set	***Developing*** a data base applications, Implement RMI and CORBA
CO3	C	Understand	***Describe*** and ***implement*** XML and CSS
		Apply	***Develop*** a document using XML and CSS
CO4	C	Understand	***Describe*** and ***implement*** various types of java beans applications
	P	GR	***Build*** a program to implement EJB applications
CO5	C	Apply	***Illustrate*** the Applets methods in Graphics, AWT controls and event handling
	P	GR	***Develop*** an applet application for drawing various shapes

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA302	**ADVANCED JAVA PROGRAMMING**	**4**	**0**	**2**	**6**
C:P:A = 4:1.5:0.5					
		L	**T**	**P**	**H**
		4	**0**	**4**	**8**

UNIT I JAVA FUNDAMENTALS — **12 + 12**

Classes, Interfaces and Packages - Exception Handling – Multithreading – I/O Streaming

Lab:

1. Program to implement the concept of interface and packages.
2. Program to implement multithreading

3. Program to implement streaming models

UNIT II DISTRIBUTED COMPUTING — **12 +12**

Networking – Remote Method Invocation – RMI – IIOP - CORBA – Java Database Connectivity – Java Beans.

Lab:

1. Program to implement network programming using TCP and UDP.
2. Program using RMI
3. Program using CORBA.

4. Program to implement JDBC

UNIT III XML AND CSS — **12 +12**

XHTML – CSS – JavaScript - Need of a Scripting Language - Language Elements-Object of JavaScript – Representing Web Data:XML - XML Documents and Vocabularies - XML Declaration - XML Namespace - JavaScript and XML:Ajax.

Lab :

1. Create a document using XML and CSS
2. Create a document using DTD

UNIT IV EJB APPLICATIONS	**12 + 18**

Java Servlets - EJB Architecture – Roles of EJB – Session Bean – Entity Bean – Deploying Applications- Server Side Component Architecture – Introduction to J2EE.

Lab:

1. Program to implement EJB.

2.Program to implement mobile application development using J2ME

UNIT V APPLETS, GRAPHICS AND FILES	**12 + 6**

Fundamentals of Applets-Graphics, AWT and Event Handling: AWT components and Event Handlers-AWT Controls and Event Handling Types and Examples.

Lab:

1. Develop an applet application for drawing various shapes

	LECTURE	**TUTORIAL**	**PRACTICAL**	**TOTAL**
	60	**-**	**60**	**120**

TEXT

1. Patrick Naughton , Herbert Schildt, JAVA2- The Complete Reference, Tata McGraw Hill,Fifth Edition, New Delhi, 2002.
2. Jeffrey C.Jackson, "Web Technologies A Computer Science Perspective" Pearson Education, 2007.
3. Stephen Asbury, Scott R. Weiner, Wiley, Developing Java Enterprise Applications, 1998
4. D.Norton and H.Schildt, Java2: The Complete Reference, TMH 2000.
5. E.Balagurusamy, Programming with Java, A primer second edition, Tata McGraw Hill, New Delhi.

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.
3. Cay S.Horstman,Gary Cornell, "Core Java ", Volume I, II, Eigth Edition, Pearson Education, 2008.
4. Tom Valesky, "Enterprise Java Beans", Pearson Education, 2002.
5. Jeremy Rosenberger,"Teach Yourself CORBA in 14 days", Tech media, 2000.

E REFERENCES

http://www.nptelvideos.com/java/java_video_lectures_tutorials.php
http://www.nptelvideos.com/java/java_video_lectures_tutorials.php
http://freevideolectures.com/Course/2513/Java-Programming.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2	0	1		2	0		1	3
CO 2	3	2	1	1		0	2		1	2
CO 3	2	2	1	2		0	2		0	2
CO 4	2	0	2	1		0	2		2	2
CO 5	2	0	2	2		0	0		2	2
Total	12	6	6	7		2	6		6	11
Course	3	2	2	2		1	2		2	3

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

YCA 303 DATA COMMUNICATION AND NETWORKING

Course Outcomes:

CO1	C	Understand	***Explain*** the various protocols, standards and encoding.
CO2	C	Understand	***Illustrate*** *the* ***c***oncept of error detection and correction.
CO3	C	Knowledge	***Analyse*** various networks and switching technique.
CO4	C	Knowledge	***Analyse*** frame relay and traffic control.
CO5	C	Understand	***Describe*** various networking devices and TCP/IP protocol suite.

COURSE CODE	COURSE NAME	L	T	P	C
YCA 303	DATA COMMUNICATION AND NETWORKING	3	0	0	3
C:P:A 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I : DATA COMMUNICATION **09**

Introduction to Networks – Protocols and standards – Standards organizations – Line configurations – Topology – Transmission mode – Categories of networks – Inter networks. OSI model: Functions of the layers. Encoding and modulating: Digital-to-digital conversion – Analog-to-digital conversion – Digital-to-analog conversion – Analog-to-analog conversion.

UNIT II : ERROR CONTROL AND DATA LINK PROTOCOLS **09**

Error detection and correction: Types of errors – Detection – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cyclic Redundancy Check (CRC) – Check sum – Error correction. Data link control: Line discipline – Flow control – Error control. Data link protocols: Asynchronous protocols – Synchronous protocols – Character oriented protocols – BIT oriented protocols.

UNIT III : NETWORKS AND SWITCHING **09**

LAN: Project 802 – Ethernet – Token bus – Token ring – FDDI. MAN: IEEE 802.6 (DQDB) – SMDS. Switching: Circuit switching – Packet switching.

UNIT IV : FRAME RELAY, ATM AND SONET/ SDH **09**

Frame relay: Introduction – Frame relay operation – Frame relay layers – Congestion control – Leaky bucket algorithm – Traffic control. ATM: Design goals – ATM architecture – ATM layers – ATM applications. SONET / SDH: Synchronous transport signals – Physical configuration–SONET layers–Applications.

UNIT V : NETWORKING DEVICES AND TCP / IP PROTOCOL SUITE **09**

Networking and internetworking devices: Repeaters – Bridges – Gateways – Other devices – Routing algorithms – Distance vector routing–Linkstaterouting.TCP / IP protocol suite: Overview of TCP/IP. Network layers: Addressing – Subnetting – Other protocols and network layers. Application layer: Domain Name System (DNS) – Telnet – File Transfer Protocol (FTP) – Trivial File Transfer Protocol (TFTP) – Simple Mail Transfer Protocol (SMTP) – SNMP.

LECTURE	TUTORIAL	TOTAL
45	-	45

TEXT

1. Behrouz A.Forouzan, Data Communication and Networking, Second Edition, Tata McGraw Hill, 2000

REFERENCES

1. William Stallings, Data and Computer Communication, 8th Edition, Pearson, 2003 / PHI.

E REFERENCES:

www.nptelvideos.in/2012/11/data-communication.html

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2	0	2	1	2	1	1	3	0
CO 2	3	1	0	2	1	2	1	1	3	1
CO 3	3	2	0	2	1	1	1	1	3	1
CO 4	3	2	0	2	1	2	1	1	3	0
CO 5	3	2	0	2	1	2	1	1	3	1
Total	15	9	0	10	5	9	5	5	15	3
Course	3	2	0	2	1	2	1	1	3	1

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

YCA 304 INFORMATION SECURITIY

Course Outcomes:

CO1	U	Understanding	***Understand*** the risk related to information security and system development life cycle**.**
CO2	U	Understanding	***Describe*** the plan for security
CO3	K	Knowledge	***Analyze*** various security technology
CO4	K	Knowledge	***Describe*** intrusion detection and prevention
CO5	U	Understanding	***Understand*** the implementation of security and change management

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA 304	**INFORMATION SECURITY**	**3**	**0**	**0**	**3**
C:P:A 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I INTRODUCTION TO INFORMATION SECURITY **09**

The History of Information Security- Key Information Security Concepts -Critical Characteristics of Information- CNSS Security Model-Components of an Information System- Balancing Information Security and Access- The Systems Development Life Cycle-The Security Systems Development Life Cycle-Investigation.

UNIT II NEED FOR SECURITY **09**

Threats- Attacks- Secure Software Development – Ethics and Information security-Overview of Risk Management-Risk Identification-Risk Assessment – Risk Control Strategies-Selecting Risk Control Strategy – Qualitative versus Quantitative Risk Control Practices.

UNIT III PLANNING FOR SECURITY **09**

Information Security Planning and Governance-Information Security Policy, Standards, and Practices -The Information Security Blueprint -Security Education, Training, and Awareness Program -Continuity Strategies.

UNIT IV FIREWALLS AND VPNS **09**

Access Control -Firewalls -Firewall Processing Modes -Firewalls Categorized by Generation -Firewalls Categorized by Structure-Firewall Architectures -Selecting the Right Firewall -Configuring and Managing Firewalls-Content Filters -Protecting Remote Connections -Remote Access -Virtual Private Networks .

UNIT V INTRUSION DETECTION AND PREVENTION SYSTEMS **09**

Introduction-Intrusion Detection and Prevention Systems - Types of IDPS- IDPS Detection Methods- IDPS Response Behavior- Selecting IDPS Approaches and Products- Strengths and Limitations of IDPSs- Deployment and Implementation of an IDPS-Measuring the Effectiveness of IDPSs

	LECTURE	**TUTORIAL**	**TOTAL**
	45	**-**	**45**

TEXT

1. Michael E.Whitman, and Herbert J.Mattord, Principles of Information Security 4th edition, Cengage Learning 2012.

REFERENCES

1. **N**ozaki, Micki Krause, Tipton, Harold F, Information Security Management Handbook - 6th Edition CRC Press,2012

2. Hossein Bidgoli, Handbook of Information Security-Information Warfare; Social,Legal, and International Issues;and Security Foundations,John Wiley& Sons Inc.2006

E REFERENCES

1. https://onlinecourses.nptel.ac.in/noc15_cs03
2. https://onlinecourses.nptel.ac.in/noc16_cs01

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2	0	2	1	2	1	1	3	0
CO 2	3	1	0	2	1	2	1	1	3	1
CO 3	3	2	0	2	1	1	1	1	3	1
CO 4	3	2	0	2	1	2	1	1	3	0
CO 5	3	2	0	2	1	2	1	1	3	1
Total	15	9	0	10	5	9	5	5	15	3
Course	3	2	0	2	1	2	1	1	3	1

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

YCA305 UNIX AND NETWORK PROGRAMMING

Course Outcomes:

CO1	C	Understand	***Demonstrate*** File System in UNIX
	P	Guided Response	***Organises*** the File I/O in UNIX Operating System
			Performs File I/O programs and commands in UNIX
	A	Response	
CO2	C	Understand	***Interpret*** UNIX processes and its relationship
	P	Guided Response	***Manipulates*** the UNIX processes
CO3	C	Understand	***Discuss*** Interprocess Communication Techniques
	P	Guided Response	***Builds*** Multiprocessing using IPC
			Selects IPC technique applied in other operating system
	A	Response	
CO4	C	Understand	***Explain*** the concepts of Sockets
	P	Guided Response	***Constructs*** the Networking process with sockets
CO5	C	Understand	***Demonstrate*** the concepts of advanced sockets
	P	Set	***Starts*** to work with sockets
	A	Response	***Practices*** advanced socket concepts in Networking

COURSE CODE	COURSE NAME	L	T	P	C
YCA305	UNIX AND NETWORK PROGRAMMING	3	0	2	5
C:P:A=3:1.5:0.5					
		L	T	P	H
		3	0	4	7

UNIT I INTRODUCTION AND FILESYSTEM **09+5**

Overview of UNIX OS – File I/O – File Descriptors – File Sharing – Files and Directories – File Types – File Access Permissions – File Systems – Symbolic Links – Basic Commands – Network Commands – Standard I/O Library – Streams and File Objects – Buffering – System Data Files and Information – Password File – Group File – Login Accounting – System Identification.

Lab:

1. Program using system calls: Create, Open , Read , Write , Close , Stat , fstat, lseek.

UNIT II PROCESSES **09+5**

Environment of a UNIX process – Process termination – Command Line Arguments – Process control – Process identifiers – Process relationships terminal logins – Signals – Threads.

Lab:

1. Application to Handle SIGCHLD signals.

UNIT III INTERPROCESS COMMUNICATION **09+20**

Fundamentals – Message Passing (SVR4) – Pipes – FIFO – Message Queues – Synchronization(SVR4) – Mutexes – Condition Variables – Read – Write Locks – File Locking – Record Locking – Semaphores – Shared memory (SVR4).

Lab:

1. Program to implement inter process communication using Pipes.
2. Program to perform inter process communication using message queues.

3. Program to perform inter process communication using shared memory.
4. Program to perform synchronization using semaphores.

UNIT IV SOCKET PROGRAMMING	09+20

Introduction – Transport Layer – Socket Introduction – Socket Address Structures – Socket Function – TCP Sockets – UDP Sockets – I/O Multiplexing – TCP Echo client server – UDP Echo client server – TCP Multi client Server – Multiplexed TCP server.

Lab:

1. Socket Programming
   a. TCP Sockets Application.
   b. UDP Sockets Application.
2. Simulation of ARP/RARP.
3. Simulation of Sliding Window Protocol.
4. Simulation of Routing Protocols.

UNIT V ADVANCED SOCKET PROGRAMMING	09+10

Debugging techniques – Raw Sockets – Socket Options – DNS – Name Address Conversion – Threaded Server – Ping – Trace Route – FTP.

Lab:

1. Developing PING application.
2. Program using URL class to download WebPages.

LECTURE	PRACTICAL	TOTAL
45	60	105

TEXT

1. W. Richard Stevens, "UNIX Network Programming, Volume 1: The Sockets Networking API", Third Edition, Pearson Education, 2007.
2. William Stallings, "SNMP, SNMPv2, SNMPv3 and RMON 1 and 2", Third Edition, Addison Wesley, 1999.

REFERENCES

1. D.E. Comer, "Internetworking with TCP/IP Vol - III", (BSD Sockets Version), Pearson Education, 2008.
2. W. Richard Stevens, "Advanced Programming in the UNIX® Environment", Second Edition, Pearson Education, 2008.

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	PO8	PSO 1	PSO 2
CO 1	3	2	1	2	1	1	1	2	1	2
CO 2	3	2	1	2	1	1	1	2	1	2
CO 3	3	2	1	2	1	1	1	2	1	2
CO 4	3	2	1	2	1	1	1	2	1	2
CO 5	3	2	1	2	1	1	1	2	1	2
Total	15	10	5	10	5	5	5	10	5	10
Course	3	2	1	2	1	1	1	2	1	2

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

YCA 401 COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

Course Outcomes:

CO1	C	Remember	***Explain*** the various types of graphic devices
	P	Apply	***Practice*** the 2D objects drawing
CO2	C	Understand	***Outline*** *the* ***c***oncept of output primitives
	P	Apply	***Practice*** operations on 2D objects
CO3	C	Remember	***Determine*** the 2D & 3D transformations
	P	Apply	***Practice*** for geometry drawing
CO4	C	Understand	***Implement*** the multimedia programs using synfig
CO5	C	Knowledge	***Summarize*** the hypermedia
	A	Recognize	***Recognize*** the multimedia tools and designs.

COURSE CODE	COURSE NAME	L	T	P	C
YCA 401	COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS	4	0	2	6
C:P:A = 4: 1.5:0.5		L	T	P	H
		4	0	4	8

UNIT I OUTPUT PRIMITIVES — **12 + 12**

Points and lines – Line-drawing algorithms – DDA algorithm – Bresenham's line algorithm – Attributes of output primitives: Line attributes – Area-fill attributes – Character attributes – Bundled attributes

Lab:
1. Write a program for circle drawing as Raster Graphics Display.
2. Write a program to draw an ellipse using Mid Point Algorithm.
3. Write a program to draw a circle using Midpoint algorithm. Modify the same for drawing an arc and sector.

UNIT II 2D AND 3D TRANSFORMATIONS — **12 + 24**

Two-dimensional Geometric transformations: Basic transformations – Matrix representations – Composite transformations – Three-Dimensional object representations − Three-Dimensional geometric and modeling transformations − Three-Dimensional viewing − Hidden surface elimination − Color models – Virtual reality – Animation

Lab:
1. Write a program for 2D line drawing as Raster Graphics Display
2. Write a program to rotate a point about origin.
3. Write a program to rotate a triangle about origin.
4. Write a program to scale the triangle.
5. Write a program to translate a triangle.

UNIT III MUTLIMEDIA — **12 + 12**

Multimedia basics − Multimedia applications − Multimedia system architecture − Evolving technologies for multimedia − Defining objects for multimedia systems − Multimedia data interface standards − Multimedia databases

Lab:

1. Create Frame by Frame Animation using multimedia authoring tools.
2. Develop a presentation for a product using techniques like Guide Layer, masking and onion Skin using authoring tools

UNIT IV MULTIMEDIA **12 + 12**

Technology: Development Tools – Image – Audio – Video- Compression and decompression − Data and file format standards − Multimedia I/O technologies − Digital voice and audio − Video image and animation − Full motion video − Storage and retrieval technologies

Lab:
1. Create tweening motion for story board activity
2. Create a JPEG image which demonstrates the various features of an image editing tool

UNIT V HYPERMEDIA **12**

Multimedia authoring and user interface − Hypermedia messaging − Mobile messaging − Hypermedia message component − Creating hypermedia message − Integrated multimedia message standards − Integrated document management − Distributed multimedia systems

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	60	0	60	120

TEXT

1. Donald Hearn and M.Pauline Baker, Computer Graphics in C Version, Fifth Edition, Pearson Education, 2015.
2. Andleigh, P. K and Kiran Thakrar , Multimedia Systems and Design, PHI, 2003.
3. Judith Jeffcoate , Multimedia in Practice: Technology and Practice., Pearson Education, 2014

REFERENCES

1. William M. Neuman, Robert R. Sprout, Principles of interactive Computer Graphics, McGraw Hill International Edition.
2. Buford J. F Koegel, Multimedia Systems, Twelfth Indian Reprint, Pearson Education

E REFERENCE

1. NPTEL, Computer Graphics by Dr. Sukhendu Das, Dept. of Computer Science and Engineering, IIT Madras

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2								
CO 2	2	1		1					1	
CO 3	2	2	2	2		1	1		2	1
CO 4	2	2		1			1		2	1
CO 5	2	1				1	1		1	1
Total	11	8	2	5	0	2	3		6	3
Course	3	2	1	0	1	1	1		2	1

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

YCA 402 .NET TECHNOLOGIES

Course Outcomes:

CO1	C	Understand Analyse	***Outline*** the .Net Technologies basic controls and events ***Classify*** the various windows programming
CO2	C P A	Understand Guided Receive	***Knowledge*** on building blocks of VB.NET ***Construct*** the program using control statement ***Sketches*** form design with various options and events ***Compiles*** the GUI component fit into the form
CO3	C P	Understand Apply Set	***Understand*** and ***utilize*** VB.Net advanced concepts ***Builds*** the form design with various advanced controls
CO4	C P A	Understand, Apply Set Recive	***Apply*** and ***Implement*** OOPS concepts in VB.Net ***Starts*** to work with OOPS in VB .Net ***Selects*** the type of OOPS concept in Web application development
CO5	C P	Understand, Apply Guided	***Understand*** and ***Apply*** ADO .Net Framework ***Begins*** to establish the connectivity with database

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA 402	**.NET TECHNOLOGIES**	**3**	**0**	**2**	**5**
C:P:A = 3:1.5:0.5					
		L	**T**	**P**	**H**
		3	**0**	**4**	**7**

UNIT I INTRODUCTION TO .NET TECHNOLOGIES **9**

Introduction to Web Technologies - HTML Basics – Scripts - Sample Programs – Advantages and Disadvantages of Client-side and Server-side Scripts - Client-side Technologies Overview - Server-side Technologies Overview History of the Platform of .NET - .NET Framework Components Overview with Focus on CLR, CTS.

UNIT II VB.NET BUILDING BLOCKS **9+10**

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

Lab:

1. Demonstrate the conditional statements in VB.NET
2. Demonstrate the looping statements in VB.NET

UNIT III APPLICATION DEVELOPMENT IN VB.NET **9+20**

Windows Forms – Working with Controls – Timer, Picture-box, Group-box, Combo-box, Horizontal and Vertical Scrollbar, Numeric-up-down, Track-bar, and Progress-bar – Menus Dialog-boxes – Pop-Menus - Developing MDI – Multithreaded Programming – Code Modularization – Subroutines and Functions in VB.NET

Lab:

1. Develop an application that demonstrates the windows controls
2. Develop a windows application with Menus and Dialog Boxes
3. Demonstrate subroutines and functions
4. Develop an application for deploying various built-in functions in VB.NET

UNIT IV OOPS DEPLOYMENT IN VB.NET | **9+20**

Classes, Objects, Methods – Methods Overloading – Events - Delegates – Inheritance – Interfaces – Encapsulation – Polymorphism – Classes Vs Components – Advanced Techniques – Drawing, and Printing – Debugging – Exception Handling

Lab:

1. Demonstrate Multithreaded Programming
2. Develop an MDI application for Employee Pay-roll transactions
3. Construct a console application to demonstrate OOP Concepts
4. Demonstrate Events, Delegates, and Interfaces

UNIT V ADO.NET CONNECTIVITY | **9+10**

Introduction to ADO.NET – ADO Vs ADO.NET – Connected ADO.NET Architecture – Disconnected ADO.NET Architecture – Data Reader - Data Adapter – ADO.NET Classes – ADO.NET - Namespaces – Interfacing VB.NET Applications with ADO.NET – Interfacing - ASP.NET Applications with ADO.NET

Lab :

1. Develop a Windows applications with database connectivity for core-banking Transactions
2. Develop a web application for dynamic Login Processing

LECTURE	PRACTICAL	TUTORIAL	TOTAL
45	60	0	105

TEXT

1. Shirish Chavan, "Visual Basic.NET", Edition 2009, Pearson Education.
2. Matt J. Crouch, "ASP.NET and VB.NET Web Programming", Edition 2012.
3. Michael Otey and Denielle Otey, "ADO.NET Complete Reference", TMH.

REFERENCES

1. Kogent Learning Solutions, ".NET Framework 4.0 in Simple Steps", Edition 2011, Dreamtech Press.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	2	1	1							
CO 2	2		1	1	1					
CO 3	2				1		1			
CO 4	2			1			1			2
CO 5	2	1	1		1					2
Total	10	2	3	2	3	0	2			4
Course	3	1	1	1	1	0	1			1

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

YCA403 SOFTWARE QUALITY ASSURANCE AND TESTING

Course Outcomes:

CO1	C	Remember Understand	***Define, Explain*** the fundamentals of SQA
CO2	C	Remember Understand	***Recall, Explain*** the defect prevention techniques and quality metrics.
	P	Guided Response	***Display*** the defect prevention method for an application
CO3	C	Remember Understand	***Show*** the need for SQA ***Illustrate*** purpose of SQA and its purpose and scope.
CO4	C	Remember Understand	***List, Explain*** the various black box and white box test case design
	A	Receiving	***Selects*** the appropriate methods to develop a test case
CO5	C	Remember Understand Perception	***Define*** the goals and policies of planning in test management ***Explain*** the Test management, control and monitoring ***Describe*** the control and monitoring issues in the software testing.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA403	**SOFTWARE QUALITY ASSURANCE AND TESTING**	**3**	**0**	**0**	**3**
C:P:A = 2.25:0.50:0.25					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE	**9**
The Role of SQA – SQA Plan – SQA considerations – SQA people – Quality Management – Software Configuration Management-Managing Software Quality -Software Standards– ISO 9000 Quality System Standards - Capability Maturity Model -Total Quality Management (TQM)	
UNIT II DEFECT PREVENTION AND QUALITY METRICS	**9**
Defect Prevention – Software Quality Assurance Management-– Quality Metrics–Software Quality Metrics Analysis	
UNIT III SOFTWARE QUALITY ASSURANCE STANDARDIZATION	**9**
Software Quality Program Concepts – Establishment of a Software Quality Program – Software Quality Assurance Planning – An Overview–Purpose & Scope.	
UNIT IV TEST CASE DESIGN	**9**
Testing as an Engineering Activity - Role of Process in Software Quality - Testing as a Process - Test Case Design Strategies - Using Black Box Approach to Test Case Design- Random Testing- Equivalence Class Partitioning - Boundary Value Analysis - Other Black-box Test Design Approaches: Black-Box Testing and COTS. Using White-Box Approach to Test design - Test Adequacy Criteria - Coverage and Control Flow Graphs - Covering Code Logic – Paths – Levels of Testing and different types of testing	
UNIT V TEST MANAGEMENT, CONTROLLING AND MONITORING	**9**
Testing and Debugging Goals and Policies, Test Planning, Test Plan Components - Test Plan Attachments - Locating Test Items, Reporting Test Results - The role of three groups in Test Planning and Policy Development - Process and the Engineering Disciplines - Introducing the test specialist - Skills needed by a test specialist - Building a Testing Group. Defining	

Terms, Measurement and Milestones for Controlling and Monitoring - Status Meetings - Reports and Control Issues - Criteria for Test Completion – SCM - Types of reviews - Developing a review program - Components of Review Plans - Reporting review results

LECTURE	TUTORIAL	TOTAL
45	0	45

TEXT

1. Mordechai Ben-Menachem / Garry S Marliss, "Software Quality", Vikas Publishing House, Pvt, Ltd., New Delhi,2010
2. Watts S Humphrey, "Managing the Software Process", Pearson Education Inc.1989
3. Elfriede Dustin, "Effective Software Testing", First Edition, Pearson Education, 2003.
4. Llene Burnstein, " Practical Software Testing", Springer International Edition, Chennai, 2003

REFERENCES

1. Boris Beizer, "Software Testing Techniques", Second Edition,Dreamtech, 2003
2. Renu Rajani, Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw Hill, 2004.

E REFERENCES

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	3	2						1	1	
CO 2	2	1						1	1	
CO 3	2	2	2		1		1	1	2	1
CO 4	2	2			1		1	1	2	1
CO 5	2	1				2	1	2	1	1
Total	11	8	2	0	2	2	3	6	7	3
Course	3	2	1	0	1	1	1	2	2	1

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

YCA404 DATA MINING AND DATA WAREHOUSING

Course Outcomes:

CO1	C	Understand	***Explain*** the concepts of data mining
	P	Apply	***Manipulates*** the mathematical calculations in data set
CO2	C	Understand	***Describe*** and ***implement*** the concept of association rule mining
	P	Apply	***Build*** an application using the concept of association rule mining.
CO3	C	Understand	***Describe*** and ***implement*** the concept of classification and clustering the datasets
	P	Apply	***Applying*** classification and clustering concepts ***i***n datasets
	A	Response	***Build*** an application for classification of data and clustering of data.
CO4	C	Understand Apply	***Describe*** and ***implement*** various types data warehouse tools
	P	Guided Response	***Build*** a program to implement data warehouse applications
CO5	C	Understand Apply	***illustrate*** the different types of mining concepts and its applications
	P	Guided Response	
	A	Response	***Build*** an application using data mining tool

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA404	**DATA MINING AND DATA WAREHOUSING**	**4**	**0**	**2**	**6**
C:P:A = 4:1.5:0.5					
		L	**T**	**P**	**H**
		4	**0**	**4**	**8**

UNIT I FUNDAMENTALS — **12 +12**

Fundamentals of Statistics – Databases – Data Mining Functionalities – Steps in Data Mining Process– Architecture of a typical Data Mining Systems – Classification of Data Mining Systems –Overview of Data Mining Techniques-Major issues in data mining.

Lab:

1. Calculate mean for Continuous and Discrete data set
2. Compute the Variance and Standard Deviation of the dataset
3. Perform Regression Analysis of the given data.

UNIT II DATA PREPROCESSING AND ASSOCIATION RULES — **12+12**

Data Pre-processing: Data Cleaning– Data Integration– Data Transformation – Data Reduction– Concept Hierarchies – Concept Description- Data Generalization - Data Summarization- Data Characterization– Mining Association Rules in Large Databases.

Lab:

1. Calculate the correlation coefficient for the given dataset.
2. Develop an application to extract association mining rule.

UNIT III PREDICTIVE MODELING **12+12**

Classification and Prediction Issues Regarding Classification and Prediction–Classification by Decision Tree Induction – Bayesian Classification – Other Classification Methods – Prediction – Clusters Analysis Types of Data in Cluster Analysis – Categorization of Major Clustering Methods Partitioning Methods – Hierarchical Methods.

Lab

1. Develop an application for classification of data using decision tree induction.
2. Develop an application for clustering the data
3. Calculate the dissimilarity between the objects using Euclidean distance method

UNIT IV DATA WAREHOUSING **12+12**

Data Warehousing Components – Multi Dimensional Data Model – Data Warehouse Architecture – Data Warehouse Implementation – Mapping the Data Warehouse to Multiprocessor Architecture – OLAP – Need – Categorization of OLAP Tools.

Lab

1. Implement the concept of snowflake schema data model
2. Implement the concept of star schema data model

UNIT V APPLICATIONS **12+12**

Applications of Data Mining – Social Impacts of Data Mining – Tools – An Introduction to DB Miner – Case Studies – Mining WWW – Mining Text Database – Mining Spatial Databases.

Lab

1. Case Study : Analyze the dataset using weka tool

LECTURE	TUTORIAL	PRACTICAL	TOTAL
60	-	60	120

TEXT

1. Jiawei Han and Micheline Kamber, Data Mining Concepts and Techniques, Morgan Kaufmann Publishers, 2002.

REFERENCES

1. Alex Berson and Stephen J. Smith, Data Warehousing- Data Mining & OLAP, TMH, 2011.
2. Usama M.Fayyad et. Al., Advances in Knowledge Discovery and Data Mining, The M.I.T Press, 2009.
3. Ralph Kimball, The Data Warehouse Life Cycle Toolkit, John Wiley & Sons Inc., 2008.

E REFERENCES

1. https://www.tacoma.uw.edu/sites/default/files/sections/InstituteTechnology/TCSS555_Datamining.pdf
2. http://www.kdnuggets.com/data_mining_course/syllabus.html

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2	0	1	0	2	0	0	1	3
CO 2	3	2	1	1	0	0	2	0	1	2
CO 3	2	2	1	2	0	0	2	0	0	2
CO 4	2	0	2	1	0	0	2	0	2	2
CO 5	2	0	2	2	0	0	0	0	2	2
Total	12	6	6	7	0	2	6	0	6	11
Course	3	2	2	2	0	1	2	0	2	3

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

YCA 501 MOBILE APPLICATION DEVELOPMENT

Course Outcomes:

CO1	C	Understand	***Explain*** the principles and design of the mobile applications.
CO2	C	Understand Apply	***Implement*** the MIDP and J2ME to develop applications.
	P	Adapt	***Executes*** the different applications with various features.
CO3	C	Knowledge	***Outline*** the J2ME architecture
	A	Receive	***Recognize*** the MIDlet suite and uses it in the program.
	P	Guided Response	***Builds*** a program model using interfaces.
CO4	C	Understand	***Describe*** record management and JDBC objects.
	A	Organize	***Integrates*** display canvas and JDBC objects.
	P	Adapt	***Apply*** JDBC packages in different data types.
CO5	C	Understand	***Implement*** and ***understand*** the SQL and connection framework.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA 501	**MOBILE APPLICATION DEVELOPMENT**	**4**	**0**	**2**	**6**
C:P:A = 4:1.5:0.5					
		L	**T**	**P**	**H**
		4	**0**	**4**	**8**

UNIT I PRINCIPLES AND DESIGN — **12 + 12 = 24**

Introduction to Mobile Applications - Characteristics - Benefits - Overview of Available Technologies - Mobile Application Design - Application Model and Infrastructure - Hardware and Software Architecture - Managing Resources - Development Workflow.

Lab :

1. Installation of Java Wireless Toolkit (J2ME)
2. Working with J2ME Features:
   a) Create a program to create the menu CUT/COPY/PASTE/DELETE/SELECT ALL/UNSELECT ALL
   b) Event Handling for Menu events.
   c) Create a menu which has the following options with a default value as on/off
      - cut - copy - paste

UNIT II DEVELOPMENT OF MOBILE APPS WITH MIDP AND J2ME — **12 + 12 = 24**

Mobile Graphics - User Interface - Scalable Vector Graphics - Mobile 3D Graphics (M3G) API - Security - Secure Design - MIDP security features - Networking - Basic Connectivity - Bluetooth Connectivity - Web Services - J2ME Overview:-Java 2 Micro Edition and the World of Java - Inside J2ME, J2ME and Wireless Devices - Small Computing Technology: Wireless Technology - Radio Data Networks - Microwave Technology - Mobile Radio Networks – Messaging - PDA.

Lab :

1.Program to work with Threads & High Level UI
   a) Create a slide show which has three slides of text. Make the slides to switch over to other slide for each 5 seconds.
   b) Create a MIDP application

2.Program to Work on Drawing and Images

UNIT III J2ME ARCHITECTURE IN DEVELOPMENT APPLICATION	12 + 18 = 30

J2ME Architecture - Small Computing Device Requirements - Run-Time Environment - MIDlet Programming - Java Language for J2ME - J2ME Software Development Kits - Hello World J2ME Style - Multiple MIDlets in a MIDlet Suite - J2ME Wireless Toolkit - The Reality of Working in a J2ME World - Best Practices Commands, Items, and Event Processing - J2ME User Interfaces - Display Class - The Palm OS Emulator - Command Class - Item Class -Exception Handling.

High-Level Display Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class

Lab:

1.Program to Develop Networked Applications using the Wireless Toolkit and to create a Simple Client-Server Application

2. Develop a UDP-based client-server application.

3.Create a Datagram Client project

UNIT IV RECORD MANAGEMENT SYSTEM AND JDBC OBJECTS	12+18 = 30

Low-Level Display Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation. Record Management System- Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

Lab :

1. Program to Authenticate a Web Server
2. Write a sample program to make a SOCKET Connection from j2ME phone.
3. Develop a Web Application using J2ME.

UNIT V SQL & CONNECTION FRAMEWORK	12

JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Subqueries, VIEWs.

	LECTURE	TUTORIAL	PRACTICALS	TOTAL
	60	0	60	120

TEXT

1. James Keogh, J2ME: The Complete Reference, Tata McGrawHill.
2. Michael Juntao Yuan,Enterprise J2ME: Developing Mobile Java Applications, Pearson Education, 2004
3. Ray Rischpater, Beginning Java ME Platform, Apress, 2009

REFERENCES

1. Sing Li, Jonathan B. Knudsen, Beginning J2ME: From Novice to Professional, Third Edition, Apress, 2005
2. J.Knudsen, Kicking Butt with MIDP and MSA:Creating Great Mobile Applications,1st edition, Pearson.

E REFERENCES

1. http://www.nptel.ac.in/courses/106108101/

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

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

YCA502 SOFTWARE PROJECT MANAGEMENT

Course Outcomes:

C01	C	Knowledge	***Describe*** the various competencies of project manager
		Understand	***Discuss*** the various SDLC and its selection methods
C02	C	Understand	***Explain*** the Managing the domain process.
		Understand	***Explain*** the team section and planning
		Understand	***Describe*** the work breakdown structure
C03	C	Understand	***Explain*** the size and cost estimation
		Understand	***Explain*** about assigning resources
C04	C	Understand	***Discuss*** the various organizational structures
		Understand	***Explain*** the team section and planning
		Understand	***Describe*** the dependences and scheduling in project management
C05	C	Understand	***Illustrate*** the various requirement eliciting methods and quality assurance.
CO6	P	Guided Response	**Construct** the UML Design and generate a code automatically using any case tools

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA 502	**SOFTWARE PROJECT MANAGEMENT**	**4**	**0**	**2**	**6**
C:P:A = 4:2:0					
		L	**T**	**P**	**H**
		4	**0**	**4**	**8**

UNIT I COMPETENCIES AND SOFTWARE DEVELOPMENT LIFE CYCLE	**12**
Introduction to Competencies - Product Development Techniques – Process Overview: SEI CMM Level 3 Is the Defined Level – IEEE 1074 Process Map for Software Life Cycle Process - Selecting Software Development Life Cycles: The SEI CMM - International Organization for Standardization (ISO) /IEC12207.	
UNIT II DOMAIN PROCESSES	**12**
Managing Domain Processes - Selecting a Project Team - Goal and Scope of the Software Project - Project Planning - Software Project Management Plan - Approaches to Building a WBS – Defining Project Milestones – Creating Work Packages - Building a WBS for Software.	
UNIT III SOFTWARE PROJECT DEVELOPMENT AND ESTIMATION	**12**
Identifying the Tasks and Activities - Software Size and Reuse Estimating: The SEI CMM and Estimating - Problems and Risks with Estimating Software Size- Estimating Duration and Cost - Effort Measures - Steps in Estimating - COCOMO: A Regression Model - COCOMO II - SLIM: A Mathematical Model – Assigning Resources: Organizational Planning – Identifying and Documenting the Project Roles and Skills Needed - Assigning Responsibilities to Individuals	
UNIT IV ORGANIZATIONAL STRUCTURE AND SCHEDULING ACTIVITIES	**12**
Choosing an Organizational Form and Structures - Considering Software Development Dependencies - Scheduling Fundamentals - PERT and CPM Scheduling - Levelling Resource Assignments - Map the Schedule to a Real Calendar.	
UNIT V QUALITY ASSURANCE	**12**
Eliciting Requirements – Requirement Management and the SEI CMM –Requirements Elicitation Methods - Guidelines for Writing Quality Requirements- Challenges in Eliciting Requirements - Quality Function Deployment – SQA	
Software Project Management lab using any case tools (Apply for any real world process):	**60**

1. Define the Problem Statement
2. Preparation of Software Requirement Specification (SRS)
3. Preparation of resource chart using project management tool
4. Cost estimation using project management tool
5. Use case diagrams
6. Activity Diagram
7. Swim lane diagram
8. Sequence Diagram
9. Collaboration Diagram
10. Class Diagram
11. Component Diagram
12. Automatic Code Generation

	LECTURE	TUTORIAL	PRACTICALS	TOTAL
	60	0	60	120

TEXT

1. Robert T. Futrell et. Al., Quality Software Project Management, Pearson Edition, 2009.

REFERENCES

1. Pankaj Jalote, Software Project Management in Practice, Addison Wesley, 2002.

E REFERENCES

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	2	1						1	1	
CO 2	2	1						1	1	
CO 3	2	2	2		1		1	1	2	1
CO 4	2	2			1		1	1	2	1
CO 5	2	1				2	1	1	1	1
CO6	2	1	2	2	1	1	1	1	1	1
Total	12	8	4	2	3	3	4	6	8	4
Course	3	2	1	1	1	1	1	2	2	1

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

YCA503 ENTREPRENEURSHIP DEVELOPMENT

COURSE CODE	COURSE NAME	L	T	P	C
YCA 503	ENTREPRENEURSHIP DEVELOPMENT	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

Course Outcome:		Domain
On the successful completion of the course, students will be able to		
CO1	***Recognise*** and ***describe*** the personal traits of an entrepreneur.	A(Receiving) C(Understand)
CO2	***Determine*** the new venture ideas and ***analyse*** the feasibility report.	C(Understand and Analyse)
CO3	***Develop*** the business plan and ***analyse*** the plan as an individual or in team.	Affective (Receiving) and C (Analyze)
CO4	***Describe*** various parameters to be taken into consideration for launching and managing small business.	C(Understand)
CO5	***Describe*** Technological management and Intellectual Property Rights	C(understand)

There are 6 Cs and 2 As for 3:0:1

UNIT I ENTREPRENEURIAL TRAITS AND FUNCTIONS **9**

Definition of Entrepreneurship; competencies and traits of an entrepreneur; factors affecting Entrepreneurship Development; Role of Family and Society ; Achievement Motivation; Entrepreneurship as a career and national development;

UNIT -II NEW PRODUCT DEVELOPMENT AND VENTURE CREATION **9**

Ideation to Concept development; Sources and Criteria for Selection of Product; market assessment ; Feasibility Report ;Project Profile; processes involved in starting a new venture; legal formalities; Ownership; Case Study.

UNIT –III ENTREPRENEURIAL FINANCE **9**

Financial forecasting for a new venture; Finance mobilization; Business plan preparation; Sources of Financing, Angel Investors and Venture Capital; Government support in startup promotion.

UNIT –IV LAUNCHING OF SMALL BUSINESS AND ITS MANGEMENT **9**

Operations Planning - Market and Channel Selection - Growth Strategies - Product Launching – Incubation, Monitoring and Evaluation of Business - Preventing Sickness and Rehabilitation of Business Units.

UNIT –V TECHNOLOGY MANAGEMENT, IPR PORTFOLIO FOR NEW PRODUCT VENTURE **9**

Technology management; Impact of technology on society and business; Role of Government in supporting Technology Development and IPR protection; Entrepreneurship Development Training and Other Support Services.

	LECTURE	TUTORIAL	TOTAL
	45	0	45

TEXT BOOKS

- Hisrich, 2016, *Entrepreneurship*, Tata McGraw Hill, New Delhi.S.S.Khanka, 2013, *Entrepreneurial Development*, S.Chand and Company Limited, New Delhi.

REFERENCE BOOKS

- Mathew Manimala, 2005, *Entrepreneurship Theory at the Crossroads, Paradigms & Praxis*,
  Biztrantra ,2nd Edition.
- Prasanna Chandra, 2009, *Projects – Planning, Analysis, Selection, Implementation and Reviews*, Tata McGraw-Hill.
- P.Saravanavel, 1997, *Entrepreneurial Development*, Ess Pee kay Publishing House, Chennai.
- Arya Kumar,2012, *Entrepreneurship: Creating and Leading an Entrepreneurial Organisation*, Pearson Education India.
- Donald F Kuratko, T.V Rao, 2012, *Entrepreneurship: A South Asian perspective*, Cengage Learning India.
- Dinesh Awasthi, Raman Jaggi, V.Padmanand, *Suggested Reading / Reference Material for Entrepreneurship Development Programmes* (EDP/WEDP/TEDP), EDI Publication, Entrepreneurship Development Institute of India, Ahmedabad. Available from: http://www.ediindia.org/doc/EDP-TEDP.pdf

E RESOURCES

- Jeff Hawkins, " Characteristics of a successful entrepreneur", ALISON Online entrepreneurship courses, "https://alison.com/learn/entrepreneurial-skills
- Jeff Cornwall, "Entrepreneurship -- From Idea to Launch", Udemy online Education, https://www.udemy.com/entrepreneurship-from-idea-to-launch/

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1						2		3		
CO 2						3		3		
CO 3						2		1		
CO 4						3		2		
CO 5						3		2		
Total						13		11		
Course						3		3		

YCAE21 ACCOUNTING AND FINANCIAL MANAGEMENT

Course Outcomes (Cos)

CO1	C	Understand	***Explain*** Accounting Principles and Concepts.
CO2	C	Understand Apply	Prepare simple final account of a sole proprietor
CO3	C	Apply	***Make Use of*** financial ratio analysis and interpret it
CO4	C	Understand	***Explain*** Marginal costing is used for decision making
CO5	C	Apply	***Prepare*** Cash budget and flexible budget.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCAE21	**ACCOUNTING AND FINANCIAL MANAGEMENT**	**3**	**0**	**0**	**3**
C:P:A = 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT – I ACCOUTING PRINCIPLES AND TERMS	**07**
Accounting Principles and Concepts – Double Entry Book Keeping – Income and Expenditure – Accounting Record and System – Assets and Liabilities.	
UNIT-II SIMPLE FINAL ACCOUNTS	**10**
Journal – Ledger – Trial Balance – Trading, Manufacturing and Profit and Loss Account – Balance Sheet	
UNIT-III RATIOS	**08**
Analysis and Interpretation of Financial Statements with Ratios	
UNIT-IV TECHNIQUES OF COSTING	**10**
Cost Accounting – Methods and Techniques of Cost Accounting – Classifications of Cost – Material Cost – Labour Cost – Overhead – Fixed and Variable Cost – Cost-Volume – Profit Analysis – Marginal Costing and Decision Making	
UNIT-V BUDGET AND BUDGETARY CONTROL	**10**
Budget and Budgetary Control – Types of Budgets – Preparation of Various Functional Budgets – Preparations of Cash Budgets – Flexible Budgets – Advantages of Budgeting and Budgetary Control	

LECTURE	**PRACTICAL**	**TOTAL**
45	**-**	**45**

TEXT

Text Books:

1. K.L. Nagarajan, N. Vinayakam, P.L. Mani, Principles of Accountancy, EURASIA, Publishing House (PVT) Ltd., Revised Edition, 2002. (UNIT I : , UNIT II :)
2. S.N. Maheswari, Principles of Management Accounting, Sultan Chand & Sons, 2001. UNIT III UNIT IV : UNIT V :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1									
CO2	1	1						1		
CO3	1				1			1		
CO4	2	1			1			1		
CO5	3	1			1			1		
Total	8	3			3			4		
Scaled	2	1	0	0	1	0	0	1	0	0

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

YCAE22 DATABASE ADMINISTRATION

Course Outcomes:

CO1	C	Understand	***Demonstrate*** Database functions
CO2	C	Understand	***Interpret*** Tables paces and Access privileges of database
CO3	C	Understand	***Explain*** the essentials of Database Management
CO4	C	Understand	***Infer*** various concepts of Database Maintenance
CO5	C	Understand	***Show*** the techniques of Data base Recovery and backup

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCAE22	**DATABASE ADMINISTRATION**	**3**	**0**	**0**	**3**
C:P:A = 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I WORKING WITH DATABASE	**09**
Understanding Database Architecture – Installation – Creating Database – Configuring Database – Deleting and dropping Database – Starting and Stopping Database.	
UNIT II ADMINISTERING TABLE SPACE & MANAGING USERS	**09**
Creating, editing and deleting Tablespaces – Retrieving the tablespace information – Managing Database with users, roles and privileges – Creating password for users.	
UNIT III DATABASE MANAGEMENT ESSENTIALS	**09**
Using SQL statements – Joins and Views – Indexing – Stored Procedures, Functions, Packages, Transactions, Triggers and Cursors.	
UNIT IV DATABASE MAINTENANCE	**09**
Types of table maintenance operations – Tuning the Database – Configuring and monitoring Undo management – Working with Undo tablespaces – Managing Undo Data - Locks and transactions – Resolving lock conflicts – Deadlock management.	
UNIT V BACKUP & RECOVERY	**09**
Types of Database Failure – Types of Database Backups – Data that need to be backed up – Recovery of the data - Restoring database.	

LECTURE	**PRACTICAL**	**TOTAL**
45	**-**	**45**

TEXT

1. Kogent Solutions, “Oracle 10g Administration in Simple Steps”, First Edition, 2008, Dreamtech.
2. Ivan Bayross, Sharanam Shah, “MySQL 5 for Professionals”, First Edition, 2007, Shroff Publications.

REFERENCES

1. Jeremy D. Zawodny et al., “High Performance MySQL”, O’Reilly Media Publications. Russell Dyer, “MySQL in a Nutshell”, O’Reilly Media Publications.
2. Rick Greenwld, Robert Stackowiak, Jonathan Stern, “Oracle Essentials: Oracle database 10g”.
3. Kevin Loney, “Oracle Database 10g: The Complete Reference”.
4. Ian Abramson, Michael S. Abbey, “Oracle Database 10g: A Beginner’s guide”.

5. Bob Byla and Biju Thomas, “OCP: Oracle 10g new features for Administrators”.
6. Chip Dawes, “OCA: Oracle 10g Administrator’s guide”.

E REFERENCES

NPTEL, Dr.S.Srinath and Prof. D.Janaki Ram, IIT Madras, “Database Design”.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	3	1	2	2	1	1	1	1	2	1
CO 2	3	2	2	2	1	1	1	1	2	2
CO 3	3	2	2	2	1	1	1	1	2	2
CO 4	3	2	2	2	1	1	1	1	2	3
CO 5	3	2	2	2	1	1	1	1	2	2
Total	15	9	10	10	5	5	5	5	10	10
Course	3	2	2	2	1	1	1	1	2	2

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

YCAE23 ADVANCED COMPUTER ARCHITECTURE

Course Outcomes:

CO1	C	Understand	***Explain*** Instruction Level Parallelism
CO2	C	Understand	***Demonstrate*** the Advanced compiler support
CO3	C	Understand	***Explain*** Multiprocessors and Thread Level Parallelism.
CO4	C	Understand	***Outline*** the concepts of Memory and I/O
CO5	C	Understand	: ***Explain*** Multi-core the architectures

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCAE23	**ADVANCED COMPUTER ARCHITECTURE**	**3**	**0**	**0**	**3**
C:P:A = 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I INSTRUCTION LEVEL PARALLELISM	**09**
ILP – Concepts and challenges – Hardware and software approaches – Dynamic scheduling – Speculation - Compiler techniques for exposing ILP – Branch prediction.	
UNIT II MULTIPLE ISSUE PROCESSORS	**09**
VLIW & EPIC – Advanced compiler support – Hardware support for exposing parallelism – Hardware versus software speculation mechanisms – IA 64 and Itanium processors – Limits on ILP.	
UNIT III MULTIPROCESSORS AND THREAD LEVEL PARALLELISM	**09**
Symmetric and distributed shared memory architectures – Performance issues – Synchronization – Models of memory consistency – Introduction to Multithreading.	
UNIT IV MEMORY AND I/O	**09**
Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time – Main memory and performance – Memory technology. Types of storage devices – Buses – RAID – Reliability, availability and dependability – I/O performance measures – Designing an I/O system.	
UNIT V MULTI-CORE ARCHITECTURES	**09**
Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture – heterogeneous multi-core processors – case study: IBM Cell Processor.	

LECTURE	**PRACTICAL**	**TOTAL**
45	**-**	**45**

TEXT BOOK

1.John L. Hennessey and David A. Patterson, " Computer architecture – A quantitative approach", Morgan Kaufmann / Elsevier Publishers, 4th. edition, 2007.

REFERENCES

1.David E. Culler, Jaswinder Pal Singh, "Parallel computing architecture : A hardware/software approach" , Morgan Kaufmann /Elsevier Publishers, 1999.

2.Kai Hwang and Zhi.Wei Xu, "Scalable Parallel Computing", Tata McGraw Hill, New Delhi, 2003.

E REFERENCE
Advanced Computer Architecture by Prof. Anshul Kumar, IIT Delhi

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	3	2	0	2	1	2	1	1	3	0
CO 2	3	2	0	2	1	2	1	0	3	0
CO 3	3	3	0	2	1	1	1	1	3	0
CO 4	3	3	0	2	1	2	1	0	3	0
CO 5	3	3	0	3	1	2	1	1	3	0
Total	15	13	0	11	5	9	5	3	15	0
Course	3	3	0	3	1	2	1	1	3	0

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

YCA E24 ENTERPRISE RESOURCE PLANNING

Course Outcomes:

CO1	C	Understand	***Explain*** the various characteristics of entrepreneurship
CO2	C	Understand	***Identify*** *the* ***c***oncept of entrepreneurial environment
CO3	C	Remember	***Describe*** the various business operations
CO4	C	Understand	***Recognize*** the evolution of small business
CO5	C	Understand	***Modify*** the small business

COURSE CODE	COURSE NAME	L	T	P	C
YCA E24	ENTERPRISE RESOURCE PLANNING	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I ENTREPRENUERIAL COMPETENCE **9**

Entrepreneurship concept – Entrepreneurship as a Career – Entrepreneur – Personality Characteristics of Successful. Entrepreneur – Knowledge and Skills Required for an Entrepreneur

UNIT II ENTREPRENEURIAL ENVIRONMENT **9**

Business Environment - Role of Family and Society - Entrepreneurship Development Training and Other Support Organizational Services - Central and State Government Industrial Policies and Regulations - International Business

UNIT III BUSINESS PLAN PREPARATION **9**

Sources of Product for Business – Pre-feasibility Study - Criteria for Selection of Product - Ownership - Capital - Budgeting Project Profile Preparation - Matching Entrepreneur with the Project - Feasibility Report Preparation and Evaluation Criteria.

UNIT IV LAUNCHING OF SMALL BUSINESS **9**

Finance and Human Resource - Mobilization Operations Planning - Market and Channel Selection - Growth Strategies - Product Launching

UNIT V MANAGEMENT OF SMALL BUSINESS **9**

Monitoring and Evaluation of Business - Preventing Sickness and Rehabilitation of Business Units - Effective Management of small Business. Role of Women Entrepreneur and SHG

	LECTURE	TUTORIAL	TOTAL
	45	0	45

TEXT

1. Hirisch, Entrepreneurship, Tata McGraw Hill, New Delhi, 2001.
2. P. Sarvanvel, Entrepreneurial Development, , Ess Pee kay Pub. House, Chennai -1997.

REFERENCES

1. S S Khanka, Entrepreneurial Development, S.Chand and Company Ltd, New Delhi, 2001.
2. Prasma ,Projects – Planning, Analysis, Selection, Implementation and Reviews, 1996

E REFERENCE

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2								
CO 2	2	1								
CO 3	2	2	2		1		1			1
CO 4	2	2			1		1			1
CO 5	3	1				2	1			1
Total	12	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

YCA E41 IMAGE PROCESSING AND COMPUTER VISION

Course Outcomes:

CO1	C	Remembering	***Explain*** the various attributes of images
CO2	C	Understanding	***Identify*** *the* ***c***oncept of image enhancement
CO3	C	Remembering	***Describe*** the various forms of image manipulations
CO4	C	Understanding	***Recognize*** the concept of image segmentation
CO5	C	Understanding	***Modify*** the image compression techniques

COURSE CODE	COURSE NAME	L	T	P	C
YCA E41	IMAGE PROCESSING AND COMPUTER VISION	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I DIGITAL IMAGE FUNDAMENTALS **9**

Elements of digital image processing systems, Vidicon and Digital Camera working principle - Elements – visual perception – brightness – contrast – hue – saturation - mach band effect - Color image fundamentals - RGB,HSI models, Image sampling, Quantization, dither, Two-dimensional mathematical preliminaries, 2D transforms - DFT, DCT, KLT, SVD.

UNIT II IMAGE ENHANCEMENT **9**

Histogram equalization and specification techniques, Noise distributions, Spatial averaging, DirectionalSmoothing, Median, Geometric mean, Harmonic mean, Contrary harmonic mean filters, Homomorphic filtering, Color image enhancement.

UNIT III IMAGE RESTORATION **9**

Image Restoration - degradation model, Unconstrained restoration - Lagrange multiplier and Constrained restoration, Inverse filtering- removal of blur caused by uniform linear motion, Wiener filtering, Geometric transformations-spatial transformations.

UNIT IV IMAGE SEGMENTATION **9**

Edge detection, Edge linking via Hough transform – Thresholding - Region based segmentation – Region growing – Region splitting and Merging – segmentation by morphological watersheds – basic concepts – Dam construction

UNIT V APPLICATIONS **9**

Photo album – Face detection – Face recognition – Eigen faces – Active appearance and 3D shape models of faces Application: Surveillance – foreground-background separation – particle filters – Chamfer matching, tracking, and occlusion – combining views from multiple cameras – human gait analysis Application: In-vehicle vision system: locating roadway – road markings – identifying road signs – locating pedestrians

LECTURE	TUTORIAL	TOTAL
45	0	45

TEXT

1. Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing, Pearson, Second Edition, 2014.
2. Anil K. Jain , Fundamentals of Digital Image Processing, Pearson 2012

REFERENCES

1. Kenneth R. Castleman, Digital Image Processing, Pearson, 2011.
2. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins, Digital Image Processing using MATLAB, Pearson Education, Inc., 2014.
3. D. E. Dudgeon, and RM Mersereau, Multidimensional Digital Signal Processing, Prentice Hall Professional Technical Reference, 1990.
4. William K. Pratt, Digital Image Processing, John Wiley, New York, 2012
5. Brookes/Cole, Image Processing Analysis and Machine Vision, Vikas Publishing House, 5th edition, 2012

E REFERENCE

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2								
CO 2	2	1								
CO 3	2	2	2		1		1			1
CO 4	2	2			1		1			1
CO 5	3	1				2	1			1
Total	12	8	2	0	2	2	3		0	3
Course	3	2								

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

YCA E42 INTERNET PROTOCOLS

Course Outcomes:

CO1	C	Understand	***Explain*** the OSI and TCP/IP protocols.
CO2	C	Understand	***Illustrate*** *the* ***c***oncept of internet protocol
CO3	C	Understand	***Discuss*** transmission control protocol.
CO4	C	Understand	***Describe*** file transfer protocol.
CO5	C	Understand	***Explain*** various network management protocol.

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA E42	**INTERNET PROTOCOLS**	**3**	**0**	**0**	**3**
C:P:A 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I : OSI AND TCP/IP MODEL **09**

Internet administration and standards. The OSI model and TCP/IP protocol, TCP/IP Versions.

UNIT II : INTERNET PROTOCOL **09**

IP addressing, different classes, subnett, supernett, delivery and routing of IP packets, IP design, ARP and RARP, Internet control message protocol, message format, error reporting and query, ICMP design, Internet group message protocol and its design, user datagram protocol, operation and design.

UNIT III : TRANSMISSION CONTROL PROTOCOL **09**

TCP services, flow control, error control, connection, congestion control, TCP design and operation, routing protocol, RIP, OSPF and BGP.

UNIT IV : FILE TRANSFER PROTOCOL **09**

Bootp and Dhcp, Dns Name Space, Distribution Of Name Space, Dns resolution, types of records, Telnet and remote login. File Transfer Protocol, connection, communication and command processing, TFTP, simple mail transfer protocol, addresses, mail delivery, multipurpose Internet mail extensions. Post office protocol.

UNIT V : NETWORK MANAGEMNET PROTOCOL **09**

Simple Network Management Protocol, Hypertext Transfer Protocol, Next Generation IP Protocols, IPv6 and ICMPv6.

LECTURE	**TUTORIAL**	**TOTAL**
45	**-**	**45**

TEXT

1. Behrouz A. Forouzan , TCP/IP Protocol Suite, 2/e , Tata McGraw Hill,2000.

REFERENCES

1.Douglas E. Comes, Internetworking with TCP/IP Vol.I: Principles, Protocols and Architecture, Prentice Hall India 2002.

E REFERENCES:

1. www.nptelvideos.in/2012/11/internet-technologies.html

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2	0	2	1	2	1	1	3	0
CO 2	3	1	0	2	1	2	1	1	3	1
CO 3	3	2	0	2	1	1	1	1	3	1
CO 4	3	2	0	2	1	2	1	1	3	0
CO 5	3	2	0	2	1	2	1	1	3	1
Total	15	9	0	10	5	9	5	5	15	3
Course	3	2	0	2	1	2	1	1	3	0

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

YCAE43 WEB APPLICATION DEVELOPMENT

Course Outcomes:

CO1	C	Understand	***Explain*** J2EE concepts and packages development
CO2	C	Understand	***Demonstrate*** the struts and Hibernate concepts
CO3	C	Understand	***Extend*** the techniques of LAMP Stack in web development
CO4	C	Understand	***Outline*** the concepts of .Net and C#
CO5	C	Understand	***Relate*** the ideas of ASP .Net and Silverlight

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCAE43	**WEB APPLICATION DEVELOPMENT**	**3**	**0**	**0**	**3**
C:P:A = 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I J2EE PLATFORM	**09**
Introduction -Enterprise Architecture Styles - J2EE Architecture - Containers - J2EE Technologies - Developing J2EE Applications - Naming and directory services – Using JNDI - JNDI Service providers - Java and LDAP - LDAP operations - Searching an LDAP server - Storing and retrieving java objects in LDAP - Application Servers - Implementing the J2EE Specifications - J2EE packaging and Deployment - J2EE packaging overview - Configuring J2EE packages.	
UNIT II STRUTS AND HIBERNATE	**09**
Struts Architecture - Struts classes - Action Forward, Action Form, Action Servlet, Action classes - Understanding struts - config.xml, Understanding Action Mappings, Struts flow with an example application, Struts Tiles Framework, Struts Validation Framework – Hibernate - Architecture of Hibernate - Downloading Hibernate - Exploring HQL - Understanding Hibernate O/R Mapping.	
UNIT III LAMP STACK	**09**
Overview of Lamp Stack - Features of Lamp Stack –Understanding Python-Understanding LAMP and its effect on Web Development.	
UNIT IV C#.NET	**09**
Introduction - .NET revolution - .NET framework and its architecture – CLR - Assembly – Components of Assembly – DLL hell and Assembly Versioning. Overview to C# - C# Compilation and Execution Process – C# fundamentals (Data types,Operators, Programming constructs) – Inheritance –Sealed Classes – Interface - Overloading – Overriding – Method Hiding – C# Property – Exception Handling.	
UNIT V ASP .NET AND SILVERLIGHT	**09**
ASP.Net- IIS - ASP.Net Page Life Cycle – ASP Vs ASP.Net - HTML Controls Vs Server side Controls – Validation Controls – Data binding in ASP.Net – Caching – Configuration in ASP.Net (web.config) – Session management – View State in ASP.Net – Silverlight – XAML – App.Xaml – XAP – Silverlight applications.	

LECTURE	**PRACTICAL**	**TOTAL**
45	**-**	**45**

TEXT

1. James Holmes “Struts: The Complete Reference” Second Edition 2007 McGraw Hill Professional.
2. Patrick Peak and Nick Heudecker, Hibernate Quickly, 2007, Dreamtech.
3. Subrahmanyam Allamaraju and Cedric Buest, "Professional Java Server Programming (J2EE 1.3 Edition)", Shroff Publishers & Distributors Pvt Ltd.
4. Jesse Liberty, “Programming C#”, 4th Edition, O'Reilly Media.

REFERENCES

1. Mario Szpuszta, Matthew MacDonald, “Pro ASP.NET 4 in C# 2010: Includes Silverlight 2”, Apress, Third Edition.
2. Jason Beres, Bill Evjen and Devin Rader, ‘Professional Silverlight 4 Print”, December 2012.
3. James Lee and BrentWare, “Open Source Development with LAMP: Using Linux, Apache, MySQL, Perl, and PHP” Addison Wesley, Pearson 2009.
4. Vern Ceder, “The Quick Python Book”, Second Edition, Manning Publications Company, 2010.

E REFERENCES

1. www.tutorialspoint.com – Hibernate Java Persistence Framework tutorialspoint.
2. www.tutorialspoint.com – Struts – 2.X tutorialspoint.
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	PO8	PSO 1	PSO 2
CO 1	3	2	0	2	1	2	1	1	3	0
CO 2	3	2	0	2	1	2	1	0	3	1
CO 3	3	3	0	2	1	1	1	1	3	1
CO 4	3	3	0	2	1	2	1	0	3	0
CO 5	3	3	0	3	1	2	1	1	3	1
Total	15	13	0	11	5	9	5	3	15	3
Course	3	3	0	3	1	2	1	1	3	1

YCA E44 PARALLEL AND DISTRIBUTED COMPUTING

Course Outcomes:

CO1	C	Knowledge	***Recognize*** Parallel computing and architecture
CO2	C	Understand	***Understand*** on architecture of Parallel computing
CO3	C	Understand	***Understand*** Distributed computing concepts and models
CO4	C P	Understand, Apply	***Apply*** and ***Implement*** Distributed and parallel computing algorithms
CO5	C P	Understand, Apply	***Understand*** and ***Apply*** various casein distributed and parallel computing

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA E44	**PARALLEL AND DISTRIBUTED COMPUTING**	**3**	**0**	**0**	**3**
C:P:A = 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I INTRODUCTION **9**

Parallel Computer Models- state of computing-Types and levels of parallelism-Multiprocessors and multicomputers - Multivector and SIMD computers- Program and Network properties-Conditions of Parallelism-Program partitioning and scheduling – Program flow mechanisms-system interconnect Architectures-Principles of scalable performance – Performance metrics and measures-Speedup performance Law.

UNIT II ARCHITECTURE **9**

Multiprocessors and multicomputers-Multiprocessor system interconnects- Cache coherence and synchronization mechanisms-message passing mechanisms-Multivector and SIMD computers-Vector processing principles-SIMD computer organization- parallel programming models-parallel languages and compilers- parallel programming environments-synchronization and multiprocessing modes-shared variable program structures-Message passing program development- mapping programs onto multi computers.

UNIT III DISTRIBUTED COMPUTING **9**

Distributed computing issues- Distributed system models-Message passing- Remote Procedure Call(RPC)- synchronization- Clock synchronization- Event ordering-mutual exclusion – Deadlock- Election algorithms- Resource management-Load balancing approach-Load sharing approach—Distributed file system- Features of good distributed file system

UNIT IV ALGORITHMS **9**

Parallel and Distributed algorithms-Introduction to Parallel algorithms and Architecture-Performance measures of parallel algorithms-Sorting- Distributed Network Algorithm-Leader election, Broadcasting and breadth first search –All pairs shortest paths-Minimum Spanning Tree.

UNIT V CASE STUDIES - MPI, PVM **9**

Message passing programming – message passing paradigm-Message Passing Interface(MPI)-point to point communication- collective MPI communication-MPI extension-Parallel Virtual Machine(PVM)-Virtual machine construction-process management in PVM- communication with PVM.

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

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

TEXT

1. Kai.Hwang, Advanced computer Architecture, Parallelism, Scalability, Programmability, Tata Mc Graw hill publishing company, 2001
2. Kenneth.A.Berman and Jerome L.Paul,Algorithms, Cengage Learning India Private Limited, 2002

REFERENCE:

1. Kai Hwang, Zhiwei Xu ,Scalable parallel computing technique, Architecture, Programming, Tata Mc Graw Hill publishing company, International edition 2000.

2. Pradeep.K Sinha, Distributed Operating systems-concepts and design, PHI, 2007.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	2	1	1							
CO 2	2		1	1						
CO 3	2		1	1						
CO 4	2			1	1					
CO 5	2	1				1				1
Total	10	2	3	3	1	1				1
Course	3	1	1	1	1	1				1

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

YCAE51 CLOUD COMPUTING

Course Outcomes:

CO1	C	Knowledge	***Characterize*** the concept of Cloud Computing
CO2	C	Understand	***Identify*** the architecture, infrastructure and delivery models of cloud computing
CO3	C	Knowledge	***Classify*** various Cloud services
CO4	C	Understand	***Choose*** the appropriate Programming Models and approach
CO5	C	Remember	***Identifies*** different applications in Cloud

COURSE CODE	COURSE NAME	L	T	P	C
YCAE51	CLOUD COMPUTING	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I CLOUD COMPUTING FOUNDATION	**09**
Introduction to Cloud Computing- Move to Cloud Computing-Types of Cloud-working of Cloud computing- Cloud Computing Technology.	
UNIT II DATA STORAGE AND VIRTUALIZATION	**09**
Data Storage-Cloud Storage- Cloud Computing frameworks-Google,EMC,Amazon and Salesforce.com. Virtualization - Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource Management – Virtualization for Data-canter Automation.	
UNIT III CLOUD SERVICES AND PROGRAMMING MODELS	**09**
Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service(IaaS) Parallel and Distributed Programming Paradigms – MapReduce, Twister and Iterative MapReduce – Hadoop Library from Apache	
UNIT IV CLOUD COMPUTING TOOLS AND TECHNOLOGIES	**09**
Grid, Cloud and Virtualization-Cloud Computing Application Platform – Tools for building cloud- Map Reduce Paradigms: Introduction, GFS Architecture, HDFS Architecture, Hbase, Google big Table, Amazon's (key value) pair storage and Microsoft's Azure infrastructure, Map reduce programming examples	
UNIT V CLOUD APPLICATIONS	**09**
Google Cloud Applications-Google App Engine-Case Study: Cloud as Infrastructure for an internet-Case Study-An Enterprise with Multiple Data Centers.	

LECTURE	TUTORIAL	TOTAL
45	0	45

TEXT

1. A.Srinivasan, J. Suresh , Cloud Computing – A Practical Approach for learning and Implementation, , Pearson Education, 2014.

REFERENCES

1. Syed A.Ahson, Mohammad Ilyas, Cloud Computing and Software Services-Theory and Techniques, CRC, 2011.
2. Anthony T. Velte Toby J. Velte, Ph.D. Robert Elsenpeter, Cloud Computing-A Practical Approach, The McGraw-Hill, 2010
3. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud" O'Reilly

E REFERENCES

1. http://track.justcloud.com/?hash=7397.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	1	1								1
CO 2	1	2		1				1		2
CO 3	2	1							1	
CO 4	1	1						1		
CO 5	2	1		1						3
Total	7	6		2				2	1	3
Course	2	2	0	1	0	0	0	1	2	2

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

YCAE52 SERVICE ORIENTED ARCHITECTURE

Course Outcomes:

CO1	C	Understand	***Explain*** basic principles of Service orientation
CO2	C	Understand	***Demonstrate*** web services and advanced concepts of SOA
CO3	C	Understand	***Interpret*** Service Oriented Analysis Techniques
CO4	C	Understand	***Describe*** technology used in SOA
CO5	C	Understand	***Explain*** various Web Services specifications and standards

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCAE52	**SERVICE ORIENTED ARCHITECTURE**	**3**	**0**	**0**	**3**
C:P:A = 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I INTRODUCTION TO SOA **09**

Roots of SOA – Characteristics of SOA - Comparing SOA to client-server and distributed internet architectures – Anatomy of SOA- Relation of components in SOA - Principles of service orientation.

UNIT II WEB SERVICES **09**

Web services – Service descriptions – Messaging with SOAP –Message exchange Patterns – Coordination –Atomic Transactions – Business activities – Orchestration – Choreography - Service layer abstraction – Application Service Layer – Business Service Layer – Orchestration Service Layer.

UNIT III SOA ANALYSIS **09**

Service oriented analysis – Business-centric SOA – Deriving business services- service modeling - Service Oriented Design – WSDL basics – SOAP basics – SOA composition guidelines – Entity-centric business service design – Application service design – Task-centric business service design.

UNIT IV SOA PLATFORM **09**

SOA platform basics – SOA support in J2EE – Java API for XML-based web services (JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC)- Web Services Interoperability Technologies (WSIT) - SOA support in .NET – Common Language Runtime - ASP.NET web forms – ASP.NET web services – Web Services Enhancements (WSE).

UNIT V WEB SERVICES TECHNOLOGY **09**

WS-BPEL basics – WS-Coordination overview - WS-Choreography, WS-Policy, WS-Security.

LECTURE	**PRACTICAL**	**TOTAL**
45	**-**	**45**

TEXT

4. Thomas Erl, Service-Oriented Architecture: Concepts, Technology, and Design, Pearson Education, 2005.

REFERENCES

1. Mark D.Hensen, "SOA using Java web services", Pearson publications, First Edition, 2007.

E REFERENCES

1. www.ibm.com/software/solutions/soa/
2. https://www.w3.org/TR/ws-arch/

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	3	3	2	2	1	1	0	0	3	1
CO 2	3	3	2	2	1	1	0	1	3	1
CO 3	3	3	3	2	1	1	1	1	3	1
CO 4	3	3	3	2	1	1	1	1	3	1
CO 5	3	3	3	1	0	1	2	1	3	1
Total	15	15	13	9	4	5	4	4	15	5
Course	3	3	3	2	1	1	1	1	3	1

YCAE53 PERVASIVE COMPUTING

Course Outcomes:

CO1	C	Understand	***Explain*** the various principles and services.
CO2	C	Understand	***Illustrate*** the various protocols and its functions
CO3	C	Knowledge	***Describe*** the various technologies of past and present in pervasive
CO4	C	Understand	***Describe*** the various technologies of past and present in pervasive computing
		Understand	***Explain t***he architecture of pervasive computing
CO5	C	Understand	***Discuss*** the various applications based on pervasive computing

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA E53	**PERVASIVE COMPUTING**	**3**	**0**	**0**	**3**
C:P:A = 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I PRINCIPLE AND SERVICES **9**

Pervasive Computing- Principles, Characteristics- interaction transparency, context aware, automated experience capture. Architecture for pervasive computing- Pervasive devices- embedded controls.- smart sensors and actuators -Context communication and access services

UNIT II PROTOCOLS **9**

Open protocols- Service discovery technologies- SDP, JINI, SLP, UpnP protocols–data synchronization- SyncML framework - Context aware mobile services - Context aware sensor networks, addressing and communications- Context aware security.

UNIT III TECHNOLOGIES **9**

Past, Present and Future-Device Technology-Device Connectivity-Web application Concepts-WAP and Beyond-Voice Technologies-Personal Digital Assistants

UNIT IV ARCHITECTURE **9**

Server side programming in Java-Pervasive Web application Architecture-Example Application- Access via PCs-Access via WAP-Access via PDA and Voice

UNIT V APPLICATIONS **9**

Smart Tokens, Heating Ventilation and Air Conditioning, Set Top Boxes, Appliances and Home Networking, Residential Gateway, Automotive Computing, On Board Computing Systems, In Vehicle networks, Entertainment Systems

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

TEXT

1. Seng Loke, Context-Aware Computing Pervasive Systems, Auerbach Pub., New York, 2007.
2. Jochen Burkhardt, , Stefan Hepper, Klaus Rindtorff, Thomas Schaeck ”Pervasive Computing-Technology and Architecture of Mobile Internet Application”,Pearson Education,sixth Edition 2009.

REFERENCES

1. Uwe Hansmann etl , Pervasive Computing, Springer, New York,2001

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	3	2						1	1	
CO 2	2	1						1	1	
CO 3	2	2	2		1		1	1	2	1
CO 4	2	2			1		1	2	2	1
CO 5	2	1				2	1	1	1	1
Total	11	8	2	0	2	2	3	6	7	3
Course	3	2	1	0	1	1	1	1	2	1

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

YCAE54 BIGDATA ANALYTICS

Course Outcomes:

CO1	C	Knowledge	***Understand*** the fundamentals of various big data analysis techniques
CO2	C	Understand	***Identify*** the architecture, infrastructure and delivery models of stream computing
CO3	C	Analyse	***Analyze*** the HADOOP and Map Reduce technologies
CO4	C	Understand Apply	***Apply*** efficient algorithms for mining the data from large volumes
CO5	C	Apply	***Explore*** on Big Data applications Using Pig and Hive

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCAE54	**BIGDATA ANALYTICS**	**3**	**0**	**0**	**3**
C:P:A = 3:0:0					
		L	**T**	**P**	**H**
		3	**0**	**0**	**3**

UNIT I INTRODUCTION TO BIGDATA **09**

Introduction to BigData Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

UNIT II MINING DATA STREAMS **09**

Introduction to Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT III HADOOP **09**

History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFS- Basics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features

UNIT IV HADOOP ENVIRONMENT **09**

Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation - Hadoop Configuration-Security in Hadoop - Administering Hadoop – HDFS - Monitoring-Maintenance-Hadoop benchmarks- Hadoop in the cloud

UNIT V FRAMEWORKS **09**

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper - IBM InfoSphere BigInsights and Streams. Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications

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

TEXT

1. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.
2. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, McGrawHill Publishing, 2012
3.Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Press, 2012

REFERENCES

1. Da Ruan,Guoquing Chen, Etienne E.Kerre, Geert Wets, Intelligent Data Mining, Springer,2007
2. Michael Minelli, Michele Chambers, Ambiga Dhiraj , Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses,Wiley, Publications,2013
3.Zikopoulos, Paul, Chris Eaton, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, Tata McGraw Hill Publications, 2011

E REFERENCES

http://www.edureka.co/big-data-and-ha...

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	1	2	2	1	1					1
CO 2	1	2	2	1				3	1	2
CO 3	2	2	2	1	1			3	1	
CO 4	1	2	3	1				3	2	
CO 5	2	3	3	1				3	2	3
Total	7	11	12	5	2			12	6	6
Course	2	3	3	1	1			3	2	2

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

YCAE55 – MOBILE COMPUTING

Course Outcomes:

CO1	C	Understanding	***Describes*** the Medium access control layers.
CO2	C	Understanding	***Characterize*** the wireless transmission technologies.
CO3	C	Remember	***Describe*** the mobile network layer and IP packet delivery.
CO4	C	Understanding	***Comprehend*** TCP and the transmission mobile transport layer.
CO5	C	Understanding	***Summarize*** the WAP and its applications.

COURSE CODE	COURSE NAME	L	T	P	C
YCAE55	MOBILE COMPUTING	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I MEDIUM ACCESS CONTROL **09**

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

UNIT II WIRELESS NETWORKS **09**

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 **09**

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 **09**

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

UNIT V ERP – WAP **09**

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

LECTURE	TUTORIAL	TOTAL
45	-	45

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
2.http://nptel.ac.in/syllabus/syllabus_pdf/106104023.pdf

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

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

YCAE56 NETWORK ADMINISTRATION

Course Outcomes:

CO1	C	Understand	***Explain*** the ***c***oncept of TCP/IP Networks
CO2	P	Understand	***Demonstrate*** the Network Management and Configuration
CO3	C	Knowledge	***Describe*** the User and Server Management
CO4	A	Understand	***Explain*** the ***c***oncept of TCP/IP Firewall and Implement the firewall security.
CO5	C	Understand	***Describe*** the IPv6 & VLAN.

COURSE CODE	COURSE NAME	L	T	P	C
YCAE56	NETWORK ADMINISTRATION	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I INTRODUCTION TO NETWORKING **09**

TCP/IP Networks : Introduction to TCP/IP-Networks – The Internet Protocol – IP over Serial Lines – The Transmission Control Protocol – The User Datagram Protocol

UNIT II NETWORK MANAGEMENT **09**

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 III USER MANAGEMENT & SERVER MANAGEMENT **09**

Root Privileges – User Management – Disk Storage – Controlling Processes – File System Web Server (Apache & IIS) – DNS Server – Mail Server – Proxy Server

UNIT IV TCP/IP FIREWALL **09**

Introduction to Firewall – IP Filtering – Setting Up Linux for Firewalling – Iptables vs Ipchains vs Ipfwadm – FTP

UNIT V INTRODUCTION TO IP6 & VLAN **09**

IPv6 Implementation – Theory on Setting IP Address(IPv6) – Subnet Mask – Overview of Virtual LAN – VLAN Memberships Identifying – VLAN Trunking – VLAN Trunk Protocol (VTP) – Concept of Translator Gateways.

LECTURE	TUTORIAL	PRACTICAL	TOTAL
45	-	-	45

TEXT BOOK

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

REFERENCE

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

E REFERENCES

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	3	2		2	1	2	1	1	3	
CO 2	3	2		2	l1	2	1		3	
CO 3	3	3		2	1	1	1	1	3	
CO 4	3	3		2	1	2	1		3	
CO 5	3	3		3	1	2	1	1	3	
Total	15	13		11	5	9	5	3	15	
Course	3	3		3	1	2	1	1	3	

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

YCAE57 SOCIAL NETWORK ANALYSIS

Course Outcomes:

CO1	C	Remembering	***Explain*** the various components in Network Analysis
CO2	C	Understanding	***Identify*** *the* ***c***oncept of Modelling and Virtualization
CO3	C	Remembering	***Describe*** various Reasoning techniques in analysis
CO4	C	Understanding	***Recognize*** the evolution of Link prediction analysis
CO5	C	Understanding	***Recognize*** Sentiment analysis and option mining

COURSE CODE	COURSE NAME	L	T	P	C
YCA E57	SOCIAL NETWORK ANALYSIS	3	0	0	3
C:P:A = 3:0:0					
		L	T	P	H
		3	0	0	3

UNIT I INTRODUCTION **9**

Introduction to Web - Limitations of current Web – Development of Semantic Web – Emergence of the Social Web – Statistical Properties of Social Networks -Network analysis - Development of Social Network Analysis - Key concepts and measures in network analysis - Discussion networks - Blogs and online communities - Web-based networks

UNIT II MODELING AND VISUALIZATION **9**

Visualizing Online Social Networks - A Taxonomy of Visualizations - Graph Representation - Centrality- Clustering - Node-Edge Diagrams - Visualizing Social Networks with Matrix-Based Representations- Node-Link Diagrams - Hybrid Representations - Modelling and aggregating social network data **–** Random Walks and their Applications –Use of Hadoop and Map Reduce - Ontological representation of social individuals and relationships

UNIT III MINING COMMUNITIES **9**

Aggregating and reasoning with social network data, Advanced Representations – Extracting evolution of Web Community from a Series of Web Archive - Detecting Communities in Social Networks - Evaluating Communities – Core Methods for Community Detection & Mining - Applications of Community Mining Algorithms - Node Classification in Social Networks.

UNIT IV EVOLUTION **9**

Evolution in Social Networks – Framework - Tracing Smoothly Evolving Communities - Models and Algorithms for Social Influence Analysis - Influence Related Statistics - Social Similarity and Influence - Influence Maximization in Viral Marketing - Algorithms and Systems for Expert Location in Social Networks - Expert Location without Graph Constraints - with Score Propagation – Expert Team Formation - Link Prediction in Social Networks - Feature based Link Prediction – Bayesian Probabilistic Models - Probabilistic Relational Models

UNIT V TEXT AND OPINION MINING **9**

Text Mining in Social Networks -Opinion extraction – Sentiment classification and clustering - Temporal sentiment analysis - Irony detection in opinion mining - Wish analysis - Product review mining – Review Classification – Tracking sentiments towards topics over time.

LECTURE	TUTORIAL	TOTAL
45	0	45

TEXT

1. Charu C. Aggarwal, Social Network Data Analysis, Springer; 2011
2. Peter Mika, Social Networks and the Semantic Web, Springer, 1st edition, 2007.
3. Borko Furht, Handbook of Social Network Technologies and Applications, Springer, 1st edition, 2010.

REFERENCES

1. Guandong Xu, Yanchun Zhang and Lin Li, Springer, Web Mining and Social Networking – Techniques and applications, 1st edition, 2011.
2. Giles, Mark Smith, John Yen, Advances in Social Network Mining and Analysis, Springer, 2010.
3. Ajith Abraham, Aboul Ella Hassanien, Václav Snášel, Computational Social Network Analysis: Trends, Tools and Research Advances, Springer, 2009.
4. Toby Segaran, Programming Collective Intelligence, O'Reilly, 2012

E REFERENCE

1. NPTEL, Social Network Prof .P. K. Tejas, Department of Computer Science Engineering Indian Institute of Technology, Kharagpur

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2							1	
CO 2	2	1								
CO 3	2	2	2		1		1		2	1
CO 4	2	2			1		1		1	1
CO 5	3	1				2	1		1	1
Total	12	8	2	0	2	2	3		5	3
Course	3	2	1	0	1	1	1		1	1

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

YCAE58 ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

Course Outcomes:

CO1	C	Knowledge	***Explain*** the concepts of Artificial Intelligence
CO2	C	Understand	***Describe*** the concept of problem reduction and search procedures
CO3	C	Knowledge	***Describe*** the knowledge representation
CO4	C	Knowledge	***Describe*** the use of NLP
CO5	C	Knowledge	***Understand*** on Expert System

COURSE CODE	COURSE NAME	L	T	P	C
YCAE58	ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS	3	0	0	3
C:P:A = 3: 0: 0					
		L	T	P	H
		3	0	0	3

UNIT I GENERAL ISSUES AND OVERVIEW OF AI **9**

The AI problems- what is an AI technique-Characteristics of AI applications- Problem Solving, Search and Control Strategies- General Problem solving- Production systems- Control strategies- forward and backward chaining Exhaustive searches- Depth first and Breadth first search.

UNIT II HEURISTIC SEARCH TECHNIQUES **9**

Hill climbing; Branch and Bound technique-Best first search and A* algorithm-AND/OR Graphs-Problem reduction and AO* algorithm- Constraint Satisfaction problems Game Playing Min Max Search procedure-Alpha-Beta cutoff- Additional Refinements.

UNIT III KNOWLEDGE REPRESENTATION **9**

First Order Predicate Calculus- Skolemnisation-Resolution Principle and Unification-Inference Mechanisms Horn's Clauses-Semantic Networks-Frame Systems and Value Inheritance-Scripts- Conceptual Dependency AI Programming Languages Introduction to LISP, Syntax and Numeric Function-List manipulation functions- Iteration and Recursion-Property list and Arrays, Introduction to PROLOG.

UNIT IV NATURAL LANGUAGE PROCESSING AND PARSING TECHNIQUES **9**

Context – Free Grammar- Recursive Transition Nets (RTN)- Augmented Transition Nets (ATN)- Semantic Analysis, Case and Logic Grammars- Planning Overview – An Example Domain: The Blocks Word- Component of Planning Systems-Goal Stack Planning (linear planning)- Non-linear Planning using constraint posting- Probabilistic Reasoning and Uncertainty-Probability theory- Bayes Theorem and Bayesian networks- Certainty Factor.

UNIT V EXPERT SYSTEMS **9**

Introduction to Expert Systems, Architecture of Expert Systems- Expert System Shells-Knowledge Acquisition-Case Studies-MYCIN, Learning, Rote Learning- Learning by Induction- explanation based learning.

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Elaine Rich and Kevin Knight: Artificial Intelligence – Third Edition, 2008, Tata McGraw Hill.
2. Dan W.Patterson, Introduction to Artificial Intelligence and Expert Systems – Prentice

Hall of India, 1990.

REFERENCES

1. Nils J. Nilsson: Principles of Artificial Intelligence – Narosa Publication house, 1982.
2. Artificial Intelligence : A Modern Approach, Stuart Rusell, Peter Norving, Pearson Education Third Edition, 2016.
3. Artificial Intelligence, Winston, Patrick, Henry, Pearson Education, Third Edition, 1992.

E REFERENCES

1. NPTEL – Artificial Intelligence by Prof. S. Sarkar Prof. Anupam Basu ,IIT Kharagpur, Computer Science and Engineering ,IIT Kharagpur,
2. NPTEL – Artificial Intelligence by Prof. P. Dasgupta ,IIT Kharagpur, Computer Science and Engineering ,IIT Kharagpur.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2	0	1	0	2	0	0	1	3
CO 2	3	2	1	1	0	0	2	0	1	2
CO 3	2	2	1	2	0	0	2	0	0	2
CO 4	2	0	2	1	0	0	2	0	2	2
CO 5	2	0	2	2	0	0	0	0	2	2
Total	12	6	6	7	0	2	6	0	6	11
Course	3	2	2	2	0	1	2	0	2	3

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

YCAS31 PERSONALITY DEVELOPMENT AND SOFT SKILL

Course Outcomes:

CO1	C	Understand	***Outline*** the various aspects of Soft Skill Development
	P	Guided Response	***Constructs*** the Soft Skill for decision making
	A	Response	***Practices*** the Soft Skill
CO2	C	Understand	***Summarize*** the concept of Positive Attitude
	A	Responding	***Studies*** the Positive Attitude from various circumstances
CO3	C	Understand	***Interpret*** Active Listening and Public Speaking
	P	Guided Response	***Assembles*** the Ideas for public speaking
CO4	C	Understand	***Illustrate*** the efficient way of writing practices.
	P	Guided Response	***Builds*** the writing practices.
CO5	C	Understand	***Explain*** the effective Body Language Methods.
	P	Set	***Starts*** to develop efficient Body Language.
	A	Responding	***Practices*** the Body Language Technique

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCAS31	**PERSONALITY DEVELOPMENT AND SOFT SKILL**	**1**	**0**	**1**	**2**
C:P:A = 1:0.5:0.5					
		L	**T**	**P**	**H**
		1	**0**	**2**	**3**

UNIT I SOFT – SKILLS INTRODUCTION **09**

What are Soft Skills? Significance of Soft-Skills – Soft-Skills Vs. Hard Skills – Selling Soft-Skills – Components of Soft Skills – Identifying and Exhibiting Soft-Skills – Soft- Skills Orientation – Top 60 Soft-Skills – Practicing Soft-Skills.

UNIT II DEVELOPING POSITIVE ATTITUDE **09**

Introduction – Meaning – Features of Attitudes – Attitudes and Behaviour – Formation of Attitudes – Change of Attitudes – Ways of changing Attitudes – Attitudes in Workplace- The power of positive Attitude- Developing Positive Attitude.

UNIT III ACTIVE LISTENING & EFFECTIVE PUBLIC SPEAKING **09**

Differences between Listening and Hearing – Critical Listening – Barriers to Active Listening – Improving Listening – Ethical Listening – Effective Public Speaking – Selecting the topic for public speaking – Understanding the audience – Evidence and Research – Organizing the main ideas – Language and Style choice in the speech.

UNIT IV PERSUASIVE WRITING **09**

Introduction – Importance of writing – Creative Writing – Writing Tips – Writing powerful email communication – Using appropriate salutations – Making subject matter significant – Anticipating, Empathizing, and understanding others while sending emails – Do and Don'ts in email communication.

UNIT V EFFECTIVE BODY LANGUAGE 09

Introduction – Voluntary and Involuntary Body Language – Parts of Body Language – Forms of Body Language – Uses of Body Language in building the Interpersonal relationship – Types of Body Language – Gender Differences – Interpreting Body Language.

LECTURE	**PRACTICAL**	**TOTAL**
15	**30**	**45**

TEXT BOOK

1. Dr. K. Alex, "Soft Skills Know yourself & Know the World", Edition 2009

2. Barun K. Mitra, “Personality Development and Soft Skills”, Sixth Impression 2012, OUP.

REFERENCES

1. Gopalaswamy Ramesh, Mahadevan Ramesh, “The Ace of Soft Skills”, Edition 2010, Pearson Education.
2. Deanna D. Sellnow, “Public Speaking – A Process Approach”, Edition 2002, Vijay Nicole Imprints Pvt. Ltd.

E REFERENCES

1. NPTEL, Communication Skills, Prof. T. Ravichandran , Department of Humanities and Social Sciences Indian Institute of Technology, Kanpur.

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO 1**	**PSO 2**
CO 1	3	2		1	1		1		1	1
CO 2	3	1		2	1	1	1	1	1	1
CO 3	3	2		2	1	2		1	1	1
CO 4	3	1		2	1	1	1	1	3	2
CO 5	3	2		2	1	2	1	1	3	2
Total	15	8		9	5	6	4	4	8	6
Course	3	2		2	1	2	1	1	2	2

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

YCAS32 DATA ANALYTICS WITH WORKSHEET

Course Outcomes:

CO1	C	Understand	***Demonstrate*** Data Management in Worksheet
	P	Guided Response	***Organises*** the data in worksheet
	A	Response	***Performs*** data organization in worksheet with variety of samples
CO2	C	Understand	***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	***Manipulates*** 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	Understand	***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**
YCAS32	**DATA ANALYTICS WITH WORKSHEET**	**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 **05**

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 **05**

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 **05**

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.

Lab Experiments **30**

1. Create a table to perform statistical and mathematical functions.
2. Create a spreadsheet to perform “What if?” calculations.
3. Demonstrates the ease of creating charts.
4. Create a spreadsheet to sort data and print portions of a worksheet.
5. Draw a Histogram Diagram in MS-Excel using student data set.
6. Import and Export the data from the database and files.
7. Perform Regression analysis with given dataset.
8. Perform correlation analysis with given data.
9. 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			
NPTEL, Dr.Nandan Sudarsanam, Dr.Balaraman Ravindran, IIT, "Introduction to Data Analytics".			

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	3	2	1	1	1	0	1	0	1	1
CO 2	3	1	2	2	1	1	1	1	1	1
CO 3	3	2	2	2	1	1	0	1	1	1
CO 4	3	1	2	2	1	1	1	1	3	2
CO 5	3	2	2	2	1	1	1	1	3	2
Total	15	8	9	9	5	4	4	4	9	6
Course	3	2	2	2	1	1	1	1	2	2

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

YCA S51 QUANTITATIVE APTITUDE

Course Outcomes:

CO1	C	Remembering	***Explain*** the manipulation with numbers
	P	Responding	***Solving*** mathematical problems
CO2	C	Understanding	***Identify*** *the* ***c***oncept of ratio
CO3	C	Remembering	***Describe*** the various business arithmetic
	P	Valuing	***Ability*** to solve business arithmetic problems
CO4	C	Remembering	***Recognize*** the evolution of simple mathematics
	P	Responding	***Solving*** the problem in simple mathematics
CO5	C	Understanding	***Modify*** the data interpretation

COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**
YCA S51	**QUANTITATIVE APTITUDE**	1	0	1	2
C:P:A = 1:1:0					
		L	**T**	**P**	**H**
		1	0	2	3

UNIT I MANIPULATION WITH NUMBERS	**9**
Numbers – H.C.F & L.C.M of Numbers – Decimal Fractions – Square Roots and Cube Roots – Surds & Indices – Average –Problems on Age – Calendar	
UNIT II DIFFERENT FORMS OF RATIO	**9**
Ratio & Proportion – Time & Work – Pipes & Cistern – Time & Distance – Problem on Trains – Boats & Streams – Product Mix Problems	
UNIT III BUSINESS ARITHMETICS	**9**
Percentage – Profit & Loss – Simple Interest – Compound Interest – Stocks & Shares – True Discount – Banker's Discount	
UNIT IV AREA, VOLUME & PERMUTATIONS	**9**
Area – Volume & Surface Area – Heights & Distances – Logarithm – Permutations & Combinations	
UNIT V DATA INTERPRETATION	**9**
Tabulation – Bar Graphs – Pie Charts – Line Graphs	

LECTURE	**TUTORIAL**	**PRACTICAL**	**TOTAL**
15	**0**	**30**	**45**

TEXT

1. R.S.Aggarwal, Quantitative Aptitude, S.Chand, Reprint 2012

REFERENCES

1. Preethi Gupta,Quantitative Aptitude , Unique Publication, 2006
2. Dinesh Khattar, A Pearson Guide To Quantitative Aptitude, Pearson, 2005

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO 1	3	2								
CO 2	2	1								
CO 3	2	2	2		1		1			1
CO 4	2	2			1		1			1
CO 5	3	1				2	1			1
Total	12	8	2	0	2	2	3		0	3
Course	3	2	1	0	1	1	1		0	1

YCAS52 PROGRAMMING WITH PHP AND MYSQL

Course Outcomes:

CO1	C P	Understand Guided Response	***Explain*** the basic function of PHP and uses of open sources technologies. ***Build*** a program to implement cookies, session and file concept.
CO2	C P	Understand Guided Response	***Explain*** the statements in MySQL and its effectiveness. ***Build*** a application to construct various queries inMySQL
CO3	C	Understand Guided Response	***Describe*** to implement PHP and MySQL. ***Build*** a application to implement PHP and MySQL.

COURSE CODE	COURSE NAME	L	T	P	C
YCAS52	PROGRAMMING WITH PHP AND MYSQL	1	0	1	2
C:P:A = 1:1: 0					
		L	T	P	H
		1	0	2	3

UNIT I INTRODUCTION TO PHP **5+10**

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. 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 simple applications using PHP.

Lab:

1. Creating a simple webpage using PHP
2. Demonstration on conditional statements and looping statements in PHP
3. Creating different types of arrays
4. Creating an application with user defined functions
5. Creating an application for file manipulation using PHP
6. Create a web application using session and cookies

UNIT II MySQL **5+10**

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 a simple table with constraints
2. Insertion, Updation and Deletion of rows in MYSQL tables
3. Demonstration of joining tables
4. Demonstrate sub queries with MYSQL
5. Demonstrate on aggregate functions and set operators

UNIT III PHP with MySQL	**5+10**

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:

1. Working with string, numeric and date functions
2. Database connectivity in PHP with MySQL

	LECTURE	**TUTORIAL**	**PRACTICALS**	**TOTAL**
	15	**0**	**30**	**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

EREFERENCE

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2
CO 1	3	2	0	2	1	2	1	1	3	0
CO 2	3	2	0	2	1	2	1	0	3	0
CO 3	3	3	0	2	1	1	1	1	3	0
CO 4	3	3	0	2	1	2	1	0	3	0
CO 5	3	3	0	3	1	2	1	1	3	0
Total	15	13	0	11	5	9	5	3	15	0
Course	3	3	0	3	1	2	1	1	3	0

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

Minor Courses from 2017-2018 for the programmes – MCA in the semesters – III, IV and V

1. Virtualization Techniques
2. Cloud Storage Technology and Security
3.Advanced Database Technology

COURSE CODE	COURSE NAME	L	T	P	C
	VIRTUALIZATION TECHNIQUES	**1**	**0**	**0**	**1**
		Duration : 16Hrs			

COURSE OUTCOMES		Domain	Level
CO1	***Define*** *Virtualization techniques*	Cognitive	Remember
CO2	**Set** virtual workstation	Psychomotor	Set

Scope

Manage VMware and Microsoft Virtual Machine (VM) technologies Leverage VMs to build testing, support, and training environments Partition physical servers to decrease operating costs Migrate from physical to virtual machines

Virtualization Concepts

Defining virtual machines (servers and workstations) Advantages of deploying Vms, VMware, Workstation, Server, ESXi

Lab

Creating Virtual Machines

Comparing workstation products

Functionality / Performance

Contrasting Windows and Linux hosts

Abstracting hardware

Partitioning shared resources
Accessing raw and virtual disks

Virtualizing CPU and memory resources

Deploying virtual workstation software

Designing virtual networks

Bridged, NAT and host-only networking

Building guest operating systems

Allocating host resources, Configuring virtual hard drives and Managing peripheral devices

Designed by:

BLUEKODE, Coimbatore

COURSE CODE	COURSE NAME	L	T	P	C
	CLOUD STORAGE TECHNOLOGY AND SECURITY	**1**	**0**	**0**	**1**
		Duration : 16Hrs			

COURSE OUTCOMES		**Domain**	**Level**
CO1	***Define*** *Cloud computing*	Cognitive	Remember
CO2	**Set** cloud computing architecture and terminology	Psychomotor	Set

Workshop overview

Cloud computing has recently emerged as one of the buzzwords in the IT industry. Numerous IT vendors are promising to offer computation, storage, and application hosting services and to provide coverage in several continents, offering service level agreements (SLA) backed performance and uptime promises for their services. While these "clouds" are the natural evolution of traditional data centers, they are distinguished by exposing resources (computation, data, and applications) as standards-based Web services and following a "utility" pricing model where customers are charged based on their utilization of computational resources, storage, and transfer of data. They offer subscription-based access to infrastructure, platforms, and applications that are popularly referred to as IaaS (Infrastructure as a Service), PaaS (Platforms a Service), and SaaS (Software as a Service).

Workshop to be covered

Cloud Architectures Foundations of Cloud Computing Research in Cloud Computing Building Enterprise Cloud Computing Environment using a Network of Computers Application Case Studies in Engineering, Image Processing, and Media Rendering Platform for building Clouds and their Innovative Application Cloud Computing Platforms

Guidelines for setting up of CLOUDS LAB

Cloud Computing Architecture Cloud Computing Terminology

Designed by:

BLUEKODE, Coimbatore

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

COURSE OUTCOMES		**Domain**	**Level**
CO1	***Define*** *Database architecture*	Cognitive	Remember
CO2	**Set** creation and manipulation of databases	Psychomotor	Set

Objectives:

The student should be made to:

- Be familiar with a commercial relational database system by writing SQL using the system.
- Be familiar with the relational database theory, and be able to write relational expressions for queries.

Session / Syllabus

- Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures
- XML Databases: XML Data Model – DTD – XML Schema – XML Querying – Web Databases
- Mobile Databases: Location and Handoff Management – Effect of Mobility on Data Management – Location Dependent Data Distribution

Lab :

Creation & Analysis of Database

Outcomes: Upon completion of the course, the student should be able to:

- Apply query evaluation techniques and query optimization techniques
- Develop transaction processing systems with concurrency control.
- Design and develop a database application system as part of a team

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