

BACHELOR OF COMPUTER APPLICATIONS REGULATIONS

ELIGIBILITY

A candidate who has passed in Higher Secondary Examination with any Academic stream or Vocational stream as one of the subject under Higher Secondary Board of Examination, Tamil Nadu as per the norms set by the Government of Tamil Nadu or an Examination accepted as equivalent thereto by the Academic Council, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the **Bachelor of Computer Applications Degree Examination** of this College after a programme study of three academic years.

PROGRAMME EDUCATIONAL OBJECTIVES

- To provide students with a strong foundation in the mathematical, logical skills and Programming ability to solve and analyze computing problems to prepare them for graduate studies, consultancy and higher learning.
- To inculcate in students professional and ethical attitude, effective communication skill, teamwork, and an ability to relate computer applications to global perspective issues and social context.
- To excel with problem solving and programming skills in various IT Fields.
- Students will demonstrate their ability to adapt to a rapidly changing environment by having learned and applied new skills and new technologies.
- To train future industry professionals
- To continue a lifelong professional development in computing that contributes in self and societal growth.

SCHEME OF EXAMINATION

Course Code	Course	Hrs of Instruction	Exam Duration (Hrs)	Max Marks			Credit Points
				CA	CE	Total	
First Semester							
Part - I							
17UTL11T/ 17UHL11H/ 17UML11M/ 17UFL11F	Tamil-I/ Hindi-I/ Malayalam-I/ French - I	5	3	25	75	100	3
Part - II							
17UEG12F	English - I	5	3	25	75	100	3
Part - III							
17UCA13A	Core I: C Programming	4	3	25	75	100	4
17UCA13B	Core II: Open Source Technologies	2	3	20	55	75	2
17UMT1AA	Allied - I: Basic Mathematics	5	3	25	75	100	4
17UCA13P	Core Practical - I: C Programming	4	3	20	30	50	2
17UCA13Q	Core Practical II: Open Source Technologies	3	3	20	30	50	2
Part - IV							
17UFC1FA	Foundation Course - I: Environmental	2	2	—	50	50	2

	Studies							
	Total	30				625	22	
Second Semester								
Part - I								
17UTL21T/ 17UHL21H/ 17UML21M/ 17UFL21F	Tamil-II/ Hindi-II/ Malayalam-II/ French - II	5	3	25	75	100	3	
Part - II								
17UEG22F	English - II	5	3	25	75	100	3	
Part - III								
17UCA23A	Core III: C++ Programming	5	3	25	75	100	4	
17UCA23B	Core IV: Digital Logic & Circuits	4	3	25	75	100	4	
17UMT2AA	Allied II: Computer Based Optimization Techniques	5	3	25	75	100	4	
17UCA23P	Core Practical - III : C++ Programming	4	3	20	30	50	2	
Part - IV								
17UFC2FA	Value Education : Human Rights	2	2	—	50	50	2	
	Total	30				600	22	
Third Semester								
Part -III								
17UCA33A	Core V: Data	5	3	25	75	100	4	

	Structures						
17UCA33B	Core VI: Java Programming	5	3	25	75	100	4
17UCA3AA	Allied III: Cyber Security	5	3	25	75	100	4
17UCA33P	Core Practical - IV: Java Programming	4	3	20	30	50	2
17UCA3SA	Skill Based Course I : Big Data Analytics	4	3	25	75	100	4
17UCA3SP	Skill Based Lab I: Big Data Analytics	3	3	20	30	50	2
Part - IV							
17UFC3FA/ 17UFC3FB/ 17UFC3FC/ 17UFC3FD/ 17UFC3FE	Basic Tamil / Advanced Tamil / Yoga for Human Excellence / Women's Rights / Constitution in India	2*	2	-	50	50	2
	NMEC - I	2	2	-	50	50	2
	Total	30				600	24
Fourth Semester							
Part - III							
17UCA43A	Core VII: DOTNET Programming	5	3	25	75	100	4
17UCA43B	Core VIII: Relational Database Management System	4	3	25	75	100	4

17UPA4AA	Allied IV : Business Accounting	5	3	25	75	100	4
17UCA43P	Core Practical - V: DOTNET Programming and RDBMS	4	3	20	30	50	2
17UCA4SA	Skill Based Course II : Mobile Application Development	4	3	25	75	100	4
17UCA4SP	Skill Based Lab II : Mobile Application Development	4	3	20	30	50	2
Part - IV							
17UFC4FA/ 17UFC4FB/ 17UFC4FC	Basic Tamil / Advanced Tamil / General Awareness	2*	2	-	50	50	2
	NMEC - II	2	2	-	50	50	2
	Total	30				600	24
Fifth Semester							
Part - III							
17UCA53A	Core IX: Data Communication and Networks	6	3	25	75	100	5
17UCA53B	Core X: Python Programming	6	3	25	75	100	4

17UCA53C	Core XI: Operating System	6	3	25	75	100	4
	Elective I :	5	3	20	55	75	4
17UCA53P	Core Practical - VI: Python Programming	4	3	20	30	50	2
17UCA53Q	Core Practical - VII: Web Technology	3	3	20	30	50	2
Part - IV							
17UCA53T	Industrial Training	Grade A To C					
	Total	30				475	21
Sixth Semester							
Part - III							
17UCA63A	Core XII: PHP & MySQL	5	3	25	75	100	5
17UCA63B	Core XIII : Software Engineering	4	3	25	75	100	4
17UCA63V	Core XIV: Project Work	4	3	40	60	100	4
	Elective II :	5	3	20	55	75	4
	Elective III:	5	3	20	55	75	4
17UCA63P	Core Practical - VIII: PHP & MySQL	4	3	20	30	50	2
17UCA63Q	Core Practical - IX: Software Testing	3	3	20	30	50	2

Part - V							
17UEX65A	EXTENSION ACTIVITY	-	-	50	-	50	2
	Total	30				600	27
Grand Total						3500	140

*** Instructional hours - Placement**

@ Extension Activities - Sports / NSS/ NCC/ YRC / Association Activities / Club Activities - No End Semester Examination

ELECTIVE - I

(Student shall select any one of the following Course as Elective in fifth semester)

S.No	Course Code	Name of the Course
1.	17UCA5EA	Web Technologies
2.	17UCA5EB	Artificial Intelligence and Expert Systems
3.	17UCA5EC	Computer Graphics

ELECTIVE - II

(Student shall select any one of the following Course as Elective in sixth semester)

S.No	Course Code	Name of the Course
1.	17UCA6EA	Cloud Computing
2.	17UCA6EB	Business Intelligence
3.	17UCA6EC	Mobile Communications

ELECTIVE - III

(Student shall select any one of the following Course as Elective in sixth semester)

S.No	Course Code	Name of the Course
1.	17UCA6ED	Internet of Things
2.	17UCA6EE	Client Server Computing
3.	17UCA6EF	Data Mining

NON MAJOR ELECTIVE COURSE

- **The department offers the following two papers as Non Major Elective Course for other than the computer science students.**

S.No.	Semester	Course Code	Name of the Course
1	III	17UNM34M	Advanced Excel Lab
2	IV	17UNM44M	Adobe Photoshop Lab

FOR PROGRAMME COMPLETION

Students shall complete:

- Language Courses (Tamil/Malayalam/French/Hindi, English) in I and II semester.
- Environmental Studies and One Value Education in I and II semester respectively.
- Allied Courses in I, II, III and IV semesters.
- Mandatory self study courses - One Value Education and General Awareness in III and IV semester respectively.
- Non Major Elective Courses in the III and IV semester respectively.
- Skill Enhancement – Aptitude in III and IV semesters.
- Elective Courses in the fifth and sixth semesters.
- An in-house project during VI semester.
- Extension activity in VI semester.
- Students must undergo Industrial training for 15 – 30 days during IV Semester Summer Vacation. Evaluation of the Report done by the Internal and external Examiner in the V Semester. Based on their performance Grade will be awarded as A to C.

A - 75 marks and above

B - 60-74 marks

C - 40-59 marks

Below 40 marks – Reappear (RA)

- Students have to complete at least one Massive Open Online Course (MOOC) from NPTEL/Spoken Tutorial /Swayam .

Total Credit Distribution

Course	Credits	Total		Credits	Cumulative
Part I : Tamil	3	2 x 100 =	200	06	12
Part II: English	3	2 x 100 =	200	06	
Part III :					
Core	5	2x 100 =	200	10	114
Core	4	10 x 100 =	1000	40	
Core	2	1 x 75 =	75	02	
Core Lab	2	9x 50 =	450	18	
Elective	4	3 x 75=	225	12	
Project	4	1 x 100 =	100	04	
Allied Theory	4	4 x 100 =	400	16	
Skill Based	4	2 x 100 =	200	08	
Skill Based Lab	2	2 x 50 =	100	04	
Part IV:					
Value Education	2	2 x 50 =	100	04	12
Environmental Studies	2	1 x 50 =	50	02	
General Awareness	2	1 x 50 =	50	02	
NMEC	2	2 x 50 =	100	04	
Part V:					
Extension Activities	2	1 x 50 =	50	02	02
Total			3500		140

Earning Extra credits is not mandatory for programme completion**Extra credits**

Course	Credit	Total credits
BEC/ Self study courses	1	1
Hindi / French/ Other foreign Language approved by certified Institutions	1	1
Type Writing / Short Hand Course	1	1
Diploma/certificate/CPT/ ACS Foundation/ NPTEL Course	1	1
Representation - Academic/Sports /Social Activities/ Extra Curricular / Co-Curricular activities at University/ District/ State/ National/ International	1	1
Total		5

Rules :

The students can earn extra credits only if they complete the above during the programme period (I to V semester) and based on the following criteria. Proof of Completion must be submitted in the office of the Controller of Examinations before the commencement of the VI semester. (Earning Extra credits are not mandatory for programme completion)

1. Student can opt BEC course/ Self study course to earn one credit. They have to Enroll and complete any one of the course during their programme period third semester.

Self study course offered by the Computer Applications Department

S. No.	Semester	Course Code	Name of the Course
1.	III	17UCASS1	Program Logic and Computer Fundamentals
2.		17UCASS2	Soft Skills

2. Student can opt Hindi/ French/ Other foreign Language approved by certified Institutions to earn one credit. The certificate(Hindi) must be obtained from **Dakshina Bharat Hindi Prachar Sabha** and He/ she has to enroll and complete during their programme period (**I to Vsemester**)
3. Student can opt for Type writing /short hand course to earn one extra credit. He/she has to enroll and complete the course during their programme period to obtain certificate through **Tamil Nadu Board of Technical Education**
4. Student can opt for Diploma/certificate/CPT/ACS Foundation/ NPTEL Course to earn one extra credit. Student who opt for Diploma/ Certificate course have to enroll any diploma/certificate course offered by Bharathiar University through our Institution. Student who opt for CPT/ ACS/CMA have to enroll and complete the foundation level during the programme period. Students who opt for NPTEL course should complete the course certificate through NPTEL.
5. Award Winners in Academic/ Representation in Sports /Social Activities/ Extra Curricular/ Co-Curricular Activities at University/ District/ State/ National/ International level can earn one extra credit.

PROGRAMME OUTCOMES

On the Successful Completion of the Programme, the following are the expected outcomes

PO Number	PO Statements
PO1	Understand the concepts of key areas in Computer Applications.
PO2	Develop student's profession and ethical attitudes, effective communication, team work and logical proficiency.
PO3	Apply knowledge of mathematical, algorithmic and computing skills.
PO4	Make use of modern tools and techniques to develop software
PO5	Develop practical skills to fulfill the needs of industry and society.

17UCA13A	CORE I : C PROGRAMMING	SEMESTER - I
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PREAMBLE:

- To develop the logic ability to solve the problem efficiently using C programming.
- To learn various concepts and techniques for problem solving and will implement those ideas using C programs.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of C Programming	K1
CO2	Understand the principles of control structures and arrays	K2
CO3	Apply the knowledge of strings and functions	K3
CO4	Build programs using structure, union and pointers	K3
CO5	Expose the concepts of file management and error handling	K2 & K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S: Strong; M: Medium ;L: Low

17UCA13A	CORE I : C PROGRAMMING	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

CONTENTS

UNIT - I

Overview of C: History of C - Importance of C - Basic structure of C programs. Constants, variables and data types: Character set - C Tokens - Keywords and identifiers - Constants - Variables - Declaration of storage classes - Assigning values to variables- Defining symbolic constants. Operators and expression: Evaluation of expressions - Precedence of arithmetic operators - Type conversions in expressions - Operator precedence and associativity - Mathematical functions - Managing input and output operations: Reading and writing a character - Formatted input and output.

UNIT - II

Decision making and branching: Simple IF, IF-ELSE, Nesting of IF-ELSE, ELSE-IF ladder, Switch statements - GOTO statement. Decision making and looping: WHILE statement - DO statement - FOR statement - Jumps in loops. Arrays: Definition & Declaration - One dimensional - Two dimensional - Multi dimensional arrays.

UNIT - III

Character arrays and strings: Introduction - Declaring and initializing string variables - Reading strings from terminal - Writing strings to screen - String handling functions. User Defined functions: Introduction - Needs & Elements of User Defined function -Definition - Return values and their types - Function calls - Function declaration - Category of functions - Nesting of functions - Recursion

- Passing arrays and Strings to functions - The scope, lifetime & Visibility of Variables .

UNIT - IV

Structures and Unions: Introduction - Defining a structure - Declaring structure variables - Accessing structure members - Structure initialization - Array of structures - Array within structures - Structure within structures - Structures and functions - Union - Bit fields. Pointers: Introduction - Understanding pointers - Accessing the address of a variable - Initializing of pointer variables - Pointers and arrays - Pointers and character strings - Pointers as function arguments.

UNIT - V

File Management: Introduction - Defining and opening a file -Closing a file - Input / Output operations on files - Error handling during I/O operations - Random access to files - Command line arguments.

TEXT BOOK

1. *E. Balagurusamy, Programming in ANSI C*, Tata McGraw Hill, New Delhi, 7th Edition, 2017.

REFERENCE BOOKS

1. *Herbert Schildt , C: The Complete Reference*, McGraw Hill, New Delhi, 4th Edition,2003.
2. *B.L.Juneja, Programming in C* , Cengage Learning, India, 5th Edition, 2011.

17UCA13B	CORE II: OPEN SOURCE TECHNOLOGIES	SEMESTER - I
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PREAMBLE:

- To introduce the concept of open Source Software.
- To enable students to learn Linux Environment.
- To make students well versed with Open Source and Shell Programming

Course Outcomes:

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

CO Number	CO Statements	Knowledge Level
CO1	Tell about the concepts of Open Source and Free software	K1
CO2	Explain HTML tags in open source environment	K2
CO3	Explain the fundamental principles CSS and Demonstrate CSS tags in web page	K2
CO4	Explain the fundamental principles of how to mounting devices and administration tasks in Open source software	K2
CO5	Develop Shell script programs	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	S	S
CO3	S	M	M	M	S
CO4	S	M	S	S	S
CO5	S	S	S	S	S

S: Strong; M: Medium; L:Low

17UCA13B	CORE II: OPEN SOURCE TECHNOLOGIES	SEMESTER - I
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Total Credits: 2
Hours Per Week: 2

CONTENTS

UNIT - I

Introduction to Open Source Software: Introduction – What is Open Source Software – Advantages of Open sources – Applications of Open source software – Open source Vs Proprietary software - Examples of Open source software.

UNIT - II

HTML: Introduction – HTML Tags – Advantages of HTML – Disadvantages of HTML – Structure of HTML document – Basic Tags in HTML – Lists – Creating Table – Linking Documents – Adding Graphics to HTML documents – Frames.

UNIT - III

CSS: Introduction – Style sheet – What is CSS? – Advantages of CSS – CSS Syntax – The Golden Rules for styles – Style sheet Basics – Adding style to Document Style -Sheet properties – Box properties – Display properties.

UNIT - IV

Linux: Introduction – Linux advantages – Benefits of Linux – Difference between Ms-DOS and Linux - Difference between Linux and Unix - Difference between Linux and Windows – Linux distributions – Linux essential commands – Linux Basic commands – File system concepts – Vi Editor.

UNIT - V

Linux Shell Script: Introduction to Shells – String processing – Investigation and managing processes – Network clients – Installing applications.

TEXT BOOK

1. *Dr.P.Rizwan Ahmed, Open Source Software*, Margam Publications, Chennai, 1st Edition, 2015.

REFERENCE BOOKS

1. *Ambavade, Linux Lab - Open Source Technology*, Dreamtech, 1st Edition, 2014.
2. *Mark G.Sobell, A Practical Guide to Fedora and Red Hat Enterprise Linux*, Red Hat, Mumbai, 7th Edition, 2013.
3. www.spoken-tutorial.org

17UMT1AA	ALLIED I : BASIC MATHEMATICS	SEMESTER - I
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PREAMBLE:

- On successful completion of this subject the students should have Understand the basic concepts of Mathematics.
- To know about the applications of Statistical and Numerical Techniques of Mathematics.

Course Outcomes

In the successful completion of the course, student will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn about Numerical Differentiation	K1
CO2	Learn about Numerical Integration	K1
CO3	Apply Statistical Techniques for data collection	K2
CO4	Solve the problems related to Measures of central tendency	K2
CO5	Solve the problems related to System of Simultaneous Linear Algebraic Equation	K3

Mapping with Programme Outcomes

COS/POS	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	S	M	S	M	M
CO2	S	M	S	M	M
CO3	M	M	S	S	M
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S- Strong; M-Medium ;L-Low

17UMT1AA	ALLIED I: BASIC MATHEMATICS	SEMESTER - I
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Total Credits:4
HoursPerWeek:5

CONTENTS

UNIT - I

System of Simultaneous Linear algebraic Equation: Gauss elimination - Gauss Jacobi Gauss Jordon - Gauss Seidal methods.

UNIT - II

Numerical Differentiations : Newton's forward Difference - Backward Difference -Stirling's formula.

UNIT - III

Numerical Integration : Trapezoidal Rule & Simpson's rule - Numerical solutions of ordinary differential Equations : Taylor series for first order derivative.

UNIT - IV

Statistics: Meaning - Definition – Collection of data - Classification and Tabulation – Diagrammatic Representation and Graphical Representation.

UNIT - V

Measures of Central Tendency : Mean – Median – Mode - Measures of dispersion :Range – Standard deviation.

TEXT BOOKS

1. *Kandasamy P and Thilagavathi K, Numerical Methods*, S.Chand and Company Ltd., New Delhi, 2004 (Unit I , II &III).

2. *R.S.N.Pillai and V.Bagavathi*, **STATISTICS**, S.Chand and Company Pvt. Ltd., 2002 (Unit IV & V).

REFERENCE BOOKS

1. *Gupta S.P and Gupta M.P*, **Business Statistics**, Sultan Chand and Sons, 2002.
2. *Venkataraman M.K*, **Numerical Methods in Science & Engineering**, NPC, Revised Edition, 2004.

17UCA13P	CORE PRACTICAL I: C PROGRAMMING	SEMESTER - I
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Total Credits: 2
Hours Per Week: 4

CONTENTS

1. Operators
2. I/O Statements
3. Conditional statements
4. Looping Statements
5. String Handling Functions
6. Arrays
7. Functions
8. Structure
9. Union
10. Pointers
11. Files
12. Command Line Arguments

17UCA13Q	CORE PRACTICAL II : OPEN SOURCE TECHNOLOGIES	SEMESTER - I
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Total Credits: 2
Hours Per Week: 3

CONTENTS

1. HTML Tables
2. HTML Frames
3. CSS Style Sheet
4. CSS Properties
5. Linux OS Installation
6. Linux command line: File System, Process Management User Administration
7. Shell Script
8. Control Structure
9. Arithmetic in shell scripting
10. Content management system using DRUPAL, Wordpress

17UCA23A	CORE III: C++ PROGRAMMING	SEMESTER - II
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PREAMBLE:

- To understand Object Oriented Programming Paradigm
- To provide knowledge on File Streams, Exception Handling and Templates and to enable the students to write programs using C++

Course Outcomes:

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

CO Number	CO Statements	Knowledge Level
CO1	Understand key concepts of object oriented programming, IO Stream and control structures	K1
CO2	Demonstrate the structure of functions, classes and objects	K2
CO3	Apply the knowledge of operator overloading and inheritance	K2,K3
CO4	Usage of pointers ,arrays and virtual functions	K3
CO5	Apply the concepts of strings and file handling functions	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	S	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S: Strong; M:Medium ;L:Low

17UCA23A	CORE III: C++ PROGRAMMING	SEMESTER - II
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Total Credits: 4
Hours Per Week: 5

UNIT - I

Introduction to C++ - key concepts of Object-Oriented Programming - Advantages - Object Oriented Languages. I/O in C++ : Streams in C++- Predefined Streams-Buffering - Stream Classes- Formatted and Unformatted data- Unformatted Console I/O Operation - Type casting with cout statements- C++ Declarations. Control Structures: - Decision Making and Statements: If.. Else, jump, goto, break, continue, Switch case statements. Loops in C++: For, While, Do.

UNIT - II

Functions in C++: Parts of Function - Passing Arguments - Inline functions - Function overloading. Classes and Objects: Classes in C++- Declaring Objects - Defining Member Functions - Static Member variables and functions - array of objects -friend functions - Overloading member functions. Constructor and Destructor: Constructor and Destructor - Characteristics - Application with constructors - Overloading Constructor - Destructors.

UNIT - III

Operator Overloading: The Keyword Operator- Overloading unary, binary operators - Overloading Friend functions - type conversion. Inheritance: Types of Inheritance - Single, Multilevel, Multiple, Hierarchical, Hybrid, Multipath inheritance - Virtual base Classes - Abstract Classes.

UNIT - IV

Pointers - Declaration - Pointer to Class, Object - this pointer - Pointers to derived classes and base classes. Arrays: Characteristics - Initialization of arrays - using functions-Memory models - new and delete operators - dynamic object. Virtual Functions: Rules for Virtual Functions - Pure Virtual Functions.

UNIT - V

String - Declaring and Initializing string objects - String Attributes. Files - File stream classes - file modes - Sequential Read / Write operations- Error Handling Functions-Exception Handling.

TEXT BOOK

1. *Ashok N. Kamthane*, **OBJECT-ORIENTED PROGRAMMING WITH ANSI AND TURBO C++**, Pearson Education Publications, New Delhi, 2nd Edition, 2013.

REFERENCE BOOKS

1. *E. Balagurusamy*, **Object-Oriented Programming With C++**, Tata Mc-Graw Hill Publication, 2005.
2. *Yashwant P Kanetkar*, **Let us C++**, BPB, New Delhi, 2007.

17UCA23B	CORE IV: DIGITAL LOGIC & CIRCUITS	SEMESTER - II
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PREAMBLE:

To inculcate the knowledge on the

- Digital behavior of the computer system
- Ideas behind the Logic of various core component of the computer system

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Illustrate the digital representations & Arithmetic Operations	K1
CO2	Understand the functional concepts of Logic gates	K2
CO3	Analyse the concept of Boolean Algebra & its simplifications	K2& K3
CO4	Acquire knowledge of Arithmetic and Logic Circuits	K1,K2
CO5	Interpret the functions of bit storage components	K2 & K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	M	S	M	S
CO3	S	M	S	M	M
CO4	S	M	S	M	M
CO5	S	M	S	M	M

S: Strong; M:Medium; L:Low

17UCA23B	CORE IV: DIGITAL LOGIC & CIRCUITS	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Number Systems: Decimal Number System - Binary Number System - Conversion of decimal to binary and binary to decimal conversions. Complements: 1's complement and 2's complement Number representation. Binary addition, Binary subtraction, Binary addition and subtraction using Complement Systems.

UNIT - II

Logic Gates: Gates Classifications: Basic Gates (AND, OR, NOT), Universal Gates (NAND, NOR), Exclusive Gates (XOR, XNOR) (except circuit diagrams) -Logic Symbols, Logic Operators, Logical expression and truth table of Basic, Universal and Exclusive gates. Conversion of Universal Gates to Basic Gates.

UNIT - III

Boolean Algebra & Simplifications: Boolean Theorems (Rules & Verification with sample values only) -reduction of expression using Sum of product Simplification -reduction of expression using Product of Sum Simplification - The K- Map method: 2 variable maps, 3-varibale map and 4-variable map.

UNIT - IV

Arithmetic Circuits & Combination Circuits: Half adder - Full adder - Half Subtractor - Full -Parallel binary adder, decimal adder (BCD adder) - Encoder -

Multiplexers - De-Multiplexers (Block Diagram, Truth Table, Circuit Diagram of above devices).

UNIT - V

Storage elements & Counters: Flip - Flops types: RS, Clocked RS, Positive Edge triggered- RS, D-Flip Flop, T-Flip Flop, JK-Flip Flop (Block Diagram, Truth Table, Circuit Diagram and Working Methodology). Counter: Ripple Counter, Modulo N Counter - Shift registers- types: PIPO (Parallel- in-Parallel-out), PISO (Parallel-in-Serial-out), SISO (Serial - in-Serial- out), and SIPO (Serial- in-Parallel-out).

TEXT BOOK

1. *R K Gaur, Digital Electronics and Microcomputers*, Dhanpat Rai Publications (P) Ltd, New Delhi, 3rd Edition, 2012.

REFERENCE BOOKS

1. *Morris Mano, Computer System Architecture*, PHI, New Delhi, 3rd Edition, 2016.

17UMT2AA	ALLIED II : COMPUTER BASED OPTIMIZATION TECHNIQUES	SEMESTER - II
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PREAMBLE:

- On successful completion of this subject the students will be able to understand various mathematical applications in industries.
- Decision making for real time Problems.

Course Outcomes

In the successful completion of the course, student will be able to

CO Number	CO Statements	Knowledge Level
CO 1	Learn about Linear Programming Problem	K1
CO 2	Learn about Elements of Queueing System	K1
CO 3	Apply game theory to analyze different situations of each player	K2
CO 4	Apply Mathematical Techniques to find solution in the real life situations	K2
CO 5	Solve the problems related to Network Analysis, Transportation and Assignment	K3

Mapping with Programme Outcomes

COS/POS	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	M	M	S	M	M
CO 2	M	M	S	S	M
CO 3	M	M	S	S	S
CO 4	M	M	S	S	S
CO 5	S	M	S	S	S

S- Strong; M-Medium ;L-Low

17UMT2AA	ALLIED II : COMPUTER BASED OPTIMIZATION TECHNIQUES	SEMESTER - II
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Total Credits: 4
Hours Per Week:5

CONTENTS

UNIT - I

Linear Programming : Mathematical formulations of linear Programming - Graphical method - Simplex method.

UNIT - II

Transportation Problem - Assignment Problem - Traveling Salesman Problem.

UNIT - III

Game Theory : Concept of Pure and Mixed Strategies -Solving 2×2 Matrix with and without saddle point - $n \times 2$ - $2 \times m$ games.

UNIT - IV (Derivations not included)

Queueing Theory : Introduction - Queueing system - Characteristics of Queueing system - symbols and Notation - Classifications of queues - Problems in $(M/M/1) : (\infty/FIFO)$.

UNIT - V

PERT & CPM : Network representation -Backward pass -Forward pass - Computation -PERT Network -Probability factor.

TEXT BOOK

1. *Manmohan, Gupta P.K and Kanthiswarup, Operations Research*, S. Chand & sons, 1997.

REFERENCE BOOKS

1. *Hamdy A Taha, Operations Research*, Pearson Education, 7th Edition, 2002.
2. *Gupta P.K and Hira D.S, Problems in Operations Research*, S. Chand Publication, 2004.

17UCA23P	CORE - PRACTICAL III : C++ PROGRAMMING	SEMESTER - II
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Total Credits: 2
Hours Per Week: 4

CONTENTS

1. Selection statements
2. Looping constructs
3. Function overloading
4. Type conversion
5. Constructor and destructor
6. Operator overloading
7. Friend function
8. Inheritance
9. File
10. Virtual functions

17UCA33A	CORE- V: DATA STRUCTURES	SEMESTER - III
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PREAMBLE:

- To understand and analyze algorithms
- To learn fundamentals of linear and non-linear Data structures
- To be familiar with searching and sorting

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Define and analyze the structure of algorithms.	K1
CO2	Explain the principles of linear and non-linear data structures.	K2
CO3	Apply the knowledge of searching procedures.	K3
CO4	Build algorithms for graph representation.	K3
CO5	Demonstrate the concept of sorting techniques.	K2

Mapping with Programme Outcomes

POS/COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	M	L	M
CO2	S	S	S	M	M	L
CO3	S	S	M	M	S	L
CO4	M	S	S	S	S	M
CO5	S	S	S	S	S	L

S-Strong, M-Medium, L-Low

17UCA33A	CORE- V: DATA STRUCTURES	SEMESTER - III
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT- I

Introduction: Introduction of Algorithms, Performance Analysis. Arrays and structures: Representation of Arrays, Array create, insert and delete of data elements - sparse Matrices Stacks and Queues: Stacks - Queues - Circular Queues - Evaluation of Expression -Infix to Postfix Conversion.

UNIT- II

Linked List: Singly Linked List: Insertion - Deletion - Reverse the elements - Linked Stacks and Queues - Polynomial Addition - Circular Linked Lists - Doubly Linked List.

UNIT-III

Trees: Basic Terminology and Representation - Binary Trees - Binary Tree Representations - Binary Trees Traversals - Threaded Binary Trees - Binary Search Trees - Search , Insert , Delete - Efficient Binary Search trees: AVL trees.

UNIT-IV

Graphs: Terminology and Representations - Traversals: Depth First Search, Breadth First Search - Minimum cost Spanning Trees- Shortest Paths and Transitive Closure

UNIT-V

Searching: Linear and Binary Search. Sorting: Bubble sort - Insertion Sort - Quick Sort - Merge Sort - Heap Sort - Hashing Techniques : Static Hashing : Hash Tables - Hashing Functions - Overflow Handling - Dynamic Hashing : Directories.

TEXT BOOK

1. *Horowitz, Shani, Anderson Freed, Fundamentals of Data Structures in C*, Universities Press, 2nd Edition, 2008.

REFERENCE BOOKS

1. *Ellis Horowitz, Sartaj Shani, Data and File Structures*, Galgotia Publication, 2010.
2. *Malik.D.S, Data Structures using C++*, Cengage learning, 1st Edition, 2003.
3. *Vaughan H.Patil, Data Structures Using C++*, Oxford Higher Education, 1st Edition ,2013.

17UCA33B	CORE VI: JAVA PROGRAMMING	SEMESTER - III
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PREAMBLE:

- To Understand fundamentals of Object-Oriented Programming in Java, including defining classes, invoking methods, using class libraries, etc.
- To Apply the concepts of multithreading, packages and string handling functions.
- To be able to use the Java SDK environment to create, debug and run simple Java programs.

Course Outcomes

On the successful completion of the course, student will be able to

CO Number	CO Statements	Knowledge Level
1	Understand the format and use of objects.	K1
2	Learn basic input/output methods and their use.	K1
3	Apply inheritance, interface, exception, packages and its use.	K3
4	Analyze JAVA applets concepts and JAVA applications concepts.	K4
5	Understand the use of various system libraries and to develop the JAVA applets and application programs.	K1

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	S	M	M	M
CO3	M	M	S	M	M
CO4	M	M	M	S	S
CO5	M	M	S	M	S

S-Strong, M-Medium, L-Low

17UCA33B	CORE VI: JAVA PROGRAMMING	SEMESTER - III
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Total Credits: 4

Hours Per Week: 5

CONTENTS

UNIT - I

Introduction to Object-Oriented Programming - The Java language - Variable Declarations and Arrays - Operators in Java. **Control Statements:** An Introduction - Selection Constructs - Iteration Constructs - Jump Constructs. **Introduction to Classes:** Instance variables - Class variables - Instance Methods - Constructors - Class Methods - Declaring Objects.

UNIT - II

Classes and Methods in Detail: Method Overloading - Constructor Overloading - this Reference - Using Objects in Method - Recursion - Access Modifiers - Inner Classes - Command Line Arguments. Inheritance: Basics of Inheritance - Super Class Variable and Subclass Object - The super reference - Constructor-Chaining - Method Overriding - The final Keyword. **Abstract Classes and Interfaces:** The abstract Classes and Methods - Defining Interface - Implementing Interfaces - Extending Interface - Interface Reference. **Exception Handling:** Types of Exceptions-Uncaught Exceptions - Handling Exceptions - User Defined Exceptions.

UNIT - III

Multithreaded Programming: Concept of Threads - Thread Creation - Thread's Life Cycle - Thread Scheduling - Synchronization and Deadlock. **Packages and Access Modifiers:** Packages - An Introduction - The package Declaration - The

import Statement – Illustration Package – The Java Language Packages. **Handling Strings:** Creating Strings – Operations on Strings – Character Extractor Methods – String Comparison Methods

UNIT - IV

Input Output Classes: Input and Output Operations – Hierarchy of classes in java.io Package – File class – InputStream and OutputStream-RandomAccessFile Class. **Applets:** Applet Basics – Applet Life Cycle – Running Applets – Methods of the Applet Class

UNIT - V

Abstract Windowing Toolkit: AWT classes – Hierarchy of Classes – Control Fundamentals – Component Class – Basic Component Classes – Various Container Classes – Frame Window in an Applet – Menus. Layout Management and Event Handling: Layout Management Policies – Standard Layout Managers – Handling Events – Hierarchy of Event Classes – Event Delegation Model – Event Classes – Event Listener Interfaces – Adapter Classes

TEXT BOOK

1. *Instructional Software Research and Development (ISRD) Group, Introduction to Object Oriented Programming through Java*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2007.

REFERENCE BOOKS

1. *E.BalaGurusamy, Programming with JAVA - A Primer*, Tata McGraw-Hill Publishing Company Limited, 3rd Edition, 2007.
2. *John R. Hubbard, Schaum's Outline of Programming with Java*, Tata McGraw- Hill Publishing Company Limited, 2nd Edition, 2007.

17UCA3AA	ALLIED III: CYBER SECURITY	SEMESTER - III
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PREAMBLE:

- To understand the categories of Cyber Security.
- To provide knowledge on Cyber Security processing for information security.
- To understand various techniques for Cyber Security.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Define the knowledge and skills to defend computer data from cyber attack.	K1
CO2	Classify the key concept of Information Security threats.	K2
CO3	Construct the methods for Information Security Systems.	K3
CO4	Understand the Hardware Security issues and security measures.	K2
CO5	Identify Security Policies and standards.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	S	M	M	S
CO3	S	M	S	M	M
CO4	S	S	S	M	S
CO5	M	M	M	M	M

S: Strong; M: Medium; L: Low

17UCA3AA	ALLIED III: CYBER SECURITY	SEMESTER - III
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT - I

Introduction to Information Systems: - Introduction - Modeling the Business process - Information System Components - Information System Categories - Individuals in the information system- development of Information Systems-
Information Security: - Introduction - Threats to Information Systems- Information Assurance - Cyber Security and Security risk analysis.

UNIT - II

Application Security: - Introduction - Data Security Considerations -Security Technology - Intrusion Detection - Access Controls - **Security Threats:-** Introduction to Security Threats -Network and Services Attack - Security Threats to E-Commerce.

UNIT - III

Development of Secure Information System:- Introduction - Developing Secure Information System- Key Elements of an Information Security Policy - Information System Development Life Cycle- Application Security -Information Security Governance and Risk Management -Risk Management -Security Architecture and Design.

UNIT - IV

Security Issues in Hardware:- Introduction - Data Storage and Downloadable Devices - Physical Security of IT Assets - CCTV and Intrusion Detection Systems - Security Measures.

UNIT - V

Security Policies:- Introduction - Why do we need Security Policies? - Security Policy Development- E-Mail Security Policies - Policy Review Process- Corporate Policy - Template of Cyber Security Policy - **Information Security Standards.**

TEXT BOOK

1. *Mayank Bhushan, Rajkumar Singh Rathore and Aatif Jamshed, **Fundamental of Cyber Security**, BPB Publications, 1st Edition, 2017.*

REFERENCE BOOK

1. *Michael E. Whiteman and Herbert J. Mattord, **Principles and Practices of Information Security**, Cengage Learning, 2009.*

17UCA33P	CORE PRACTICAL - IV: JAVA PROGRAMMING	SEMESTER - III
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Total Credits: 2
Hours per Week: 4

CONTENTS

1. Conditional and Looping Statements.
2. Array.
3. String handling.
4. Inheritance.
5. Interface.
6. Package.
7. Multithreading.
8. Exception handling.
9. Applet.
10. AWT.
11. File.
12. RMI.

17UCA3SA	SKILL BASED COURSE I: BIG DATA ANALYTICS	SEMESTER - III
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PREAMBLE:

- To introduce the concept of Big Data Analytics.
- To enable students to learn machine learning.
- To make students well versed with Hadoop, Hive and NoSQL.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn the concept of big data analytics.	K1
CO2	Understand knowledge of Hadoop and HDFS.	K2
CO3	Apply the knowledge of Hive Query Language.	K3
CO4	Build programs using NoSQL.	K3
CO5	Apply the concepts of R Tool.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	M	S	S	S
CO3	S	M	S	S	S
CO4	S	M	S	S	S
CO5	S	M	S	S	S

S: Strong M: Medium L: Low

17UCA3SA	SKILL BASED COURSE I: BIG DATA ANALYTICS	SEMESTER - III
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Total Credits: 4
Hours Per Week: 4

CONTENTS

UNIT - I

Introduction to Big Data: Characteristics, Evolution, Definition, Challenges, Volume, Velocity, Variety, Traditional Business Intelligence Versus Big Data, A Typical Data Warehouse Environment, A Typical Hadoop Environment, Classification of Analytics, Terminologies used in Big Data Environments.

UNIT - II

Introduction to Hadoop, Distributed Computing Challenges, History of Hadoop, Hadoop Overview, Use Case of Hadoop, Hadoop Distributors, Hadoop Distributed File System: Anatomy of File Read, Anatomy of File Write, Replica Placement Strategy, Working with HDFS Commands, Special features of HDFS.

UNIT - III

Introduction to Hive: History, Hive features, Hive Integration and work flow, Hive data units, Hive Architecture, Hive data types, Hive file format, Hive Query Language, Data Definition Language statement, Data Manipulation Language Statement, Starting Hive Shell, Database, Tables, Partitions, Bucketing, Views, Sub-Query, Joins, Aggregation, User defined function.

UNIT - IV

The Big Data Technology Landscape:NoSQL, Types of NoSQL Databases, Use of NOSQL in Industry, NOSQL Vendors, SQL versus NOSQL, NewSQL, Comparison of SQL,NOSQL and NewSQL.

Introduction to Machine Learning: Machine Learning Definition, Machine Learning Algorithms: Regression Model-Linear Regression, Clustering, Collaborative filtering, Association Rule Mining, Decision Tree.

UNIT - V

R Language Introduction - Scientific Calculator - Inspecting variables - Vector, Matrices and Arrays - List and Data Frames - Functions.

TEXT BOOK

- 1.Seema Acharya and Subhashini Chellappan,"**Big Data and Analytics**", Wiley India Pvt Ltd, First edition, 2015.
- 2.Richard Cotton, "**Learning R**", Oreilly Media Inc, First Edition, 2013.

REFERENCE BOOKS

- 1.*Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis and Paul Zikopoulos, **Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data**, McGrawHill Publishing, 2012.*
- 2.*Bill Franks, **Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics**, John Wiley & Sons, 2012.*

17UCA3SP	SKILL BASED LAB I: BIG DATA ANALYTICS	SEMESTER - III
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Total Credits: 2
Hours per Week: 3

CONTENTS

1. Data manipulation.
2. Arrays.
3. List.
4. Frames.
5. Functions.
6. Loops.
7. Working with Dataset.
8. Working with Graphs.

17UCA43A	CORE VII : DOTNET PROGRAMMING	SEMESTER - IV
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PREAMBLE:

- To understand the goals and objectives of the .Net Framework.
- To gain knowledge about the methodologies of C#.Net
- To develop window applications, database connectivity and web applications

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of C#.Net Programming	K1
CO2	Illustrate standard control structures and arrays regulatory functions	K2
CO3	Learn the additional features in C#.Net	K1
CO4	Develop the knowledge of generic controls and build programs	K3
CO5	Expose the concepts of database connectivity and web controls	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S: Strong M: Medium L: Low

17UCA43A	CORE VII : DOTNET PROGRAMMING	SEMESTER - IV
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT - I

Introduction to Visual C#.Net: Introduction-.Net Framework-.Net Base Classes-DLL, COM, COM+,DCOM and Assemblies-VC#.Net Language-Development and Execution of a simple VC#.Net Program in the Command Prompt Window. Features in Visual Studio.Net: Start page-Solution Explorer Window-Class View window-Object Browser-Code Window. Data Types and Console I/O: Value types and Reference types-Boxing and Unboxing-variable declaration and Initialization-Data type conversion-Console I/O functions.

UNIT - II

Control Statement:- foreach statement - Goto statement. Arrays and Methods: **One-dimensional arrays-Two-dimensional arrays** - Jagged array - array and Arraylist Classes - Methods - value Type parameters - out Type parameters - params Type parameters - method overloading. Classes and Objects- Properties, Indexers and Operator Overloading- Inheritance and Polymorphism.

UNIT - III

Interfaces, Namespaces and Components - Delegates, Events and Attributes - Exception Handling.

UNIT - IV

Window Applications-I : Classes used in windows applications - Textbox and Label controls- Button - checkbox - radiobutton - groupbox - listbox -

checkedlistbox – combobox – calendar control – docking – progressbar – trackbar
– panel – treeview – splitter – menu – dialog boxes – toolbar – statusbar.

UNIT - V

DataBase connectivity DataBase connectivity – Basic web controls: Advantages of ASP.Net-ASP.Net Object Model – server-side controls – server-side processing of client-side events-Calendar controls-Adrotater control. Validation and list web controls.

TEXT BOOK

1. C. Muthu..Visual C# .Net, Vijay Nicole Publication, 1st Edition ,2007.

REFERENCE BOOKS

1. *Balagurusamy. E, Programming in C# A Primer*, Tata McGraw Hill, 3rd Edition, 2010.
2. *Matt Telles, C# Programming - Black Book*, Dreamtech Press,2008.

17UCA43B	CORE VIII: RELATIONAL DATABASE MANAGEMENT SYSTEM	SEMESTER - IV
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PREAMBLE:

- To Understand functional components of the DBMS and the normalization forms in building an effective database tables.
- To formulate queries using Relational Algebra, Relational Calculus and SQL.
- To Develop application programs using PL/SQL.

Course Outcome

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

CO Number	CO Statements	Knowledge Level
1	Understand the basic concepts of database concepts, database design and data modeling and normalization.	K1
2	Obtain knowledge on database environment.	K2
3	Know the DML commands.	K2
4	Learn the concepts of PL/SQL.	K3
5	Analyze the various composite data types.	K4

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	M	S	M	M
CO3	S	M	S	M	S
CO4	S	M	M	M	M
CO5	S	M	S	S	S

S: Strong M: Medium L: Low

17UCA43B	CORE VIII: RELATIONAL DATABASE MANAGEMENT SYSTEM	SEMESTER - IV
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Total Credits: 4
Hours Per Week: 4

CONTENTS

UNIT - I

Database Concepts: A Relational approach: Database - Relationships - DBMS - Relational Data Model - Integrity Rules - Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling - Dependency - Database Design - Normal forms - Dependency Diagrams - De-normalization - Another Example of Normalization.

UNIT - II

Oracle9i: Oracle9i an introduction - SQL. Oracle Tables: DDL: Naming Rules and conventions - Data Types - Constraints - Creating Oracle Table - Displaying Table Information - Altering an Existing Table - Dropping, Renaming, Truncating Table - Table Types - Spooling - Error codes.

UNIT - III

Data Management and Retrieval: DML - adding a new Row/Record - Customized Prompts - Updating and Deleting an Existing Rows/Records - retrieving Data from Table - Arithmetic Operations - restricting Data with WHERE clause - Sorting - Revisiting Substitution Variables - DEFINE command - CASE structure. Functions and Grouping: Built-in functions -Grouping Data. Multiple Tables: Joins and Set operations: Join - Set operations.

UNIT - IV:

PL/SQL: History - Fundamentals - Block Structure - Comments - Data Types - Other Data Types - Declaration - Assignment operation - Bind variables - Substitution Variables - Printing - Arithmetic Operators. Control Structures and Embedded SQL: Control Structures - Nested Blocks - SQL in PL/SQL - Data Manipulation - Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors - Implicit & Explicit Cursors and Attributes - Cursor FOR loops - SELECT...FOR UPDATE - WHERE CURRENT OF clause - Exceptions - Types of Exceptions.

UNIT-V

PL/SQL Composite Data Types: Records - Tables - arrays. Named Blocks: Procedures - Functions - Packages -Triggers.

TEXT BOOK

1. *Nilesh Shah, Database Systems Using ORACLE, PHI, 2nd Edition ,2011.*

REFERENCE BOOKS

1. *Arun Majumdar & Pritimoy Bhattacharya, Database Management Systems, TMH, 2007.*
2. *Kevin Loney, George Koch, and the Experts at TUSC, Oracle 9i: The Complete Reference, TMH, 2002 Copy Right.*

17UPA4AA	ALLIED-IV :BUSINESS ACCOUNTING	SEMESTER - IV
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PREAMBLE:

- To understand the rules of accounting used to enter the business transactions in a systematic manner to maintain books of accounts.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Know the book - keeping, concepts and conventions of accounting and rules of accounting and its types.	K1
CO2	Capture the procedures relating to pass journal entries, posting of ledger, trial balance and subsidiary books	K3
CO3	Obtain knowledge to prepare final accounts of a sole trader and to gain skills to detect and prevent errors in journal and ledger accounts	K2
CO4	Know the consignment accounting and joint venture accounting and its methods.	K3
CO5	Classify and apply appropriate methods of depreciation	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	M	S	M	M
CO3	S	M	S	M	S
CO4	S	M	M	M	M
CO5	S	M	S	S	S

S: Strong M: Medium L: Low

17UPA4AA	ALLIED-IV :BUSINESS ACCOUNTING	SEMESTER - IV
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT - I

Fundamentals of Book Keeping: Definition, objectives, methods of accounting, Branches of accounting, Types of Accounts and Accounting rules - Accounting Concepts and Conventions - double entry system - advantage - difference between double entry and single entry.

UNIT - II

Journal, ledger, and Trial balance, subsidiary books - purchase book, sales books, purchase returns book, sales returns book and cash book with single, double and triple column cash book

UNIT - III

Final accounts - trading and profit and loss A/C and balance sheet with simple adjustments

UNIT - IV

Accounting for consignments and Joint ventures: Consignment Meaning, definition, features, account sales, valuation of unsold stock, goods sent on consignment at cost price various commission to consignee (only Problem). Joint venture: Meaning, features, distinction between joint venture and partnership, joint venture and consignment.(Only Theory).

UNIT - V

Depreciation - Meaning- Features- Methods- Straight Line Method- WDV Method - Annuity Method.

Note: Distribution of Marks between problems and theory shall be 80% and 20%.

TEXT BOOK

1. *Vinayakam N., Mani P.L., and Nagarajan K.L, Principles of Accountancy , S.Chand & Company Ltd., New Delhi, 2003.*
2. *Jain S P and Narang K L, Advanced Accountancy, Kalyani Publishers, New Delhi, 2000.*

REFERENCE BOOKS

1. *Gupta R.L., Gupta V.K. and Shukla M.C, Financial Accounting, Sultan chand & sons, New Delhi,2006,.*
2. *Maheswari S.K., and Reddy T.S, Advanced Accountancy, Vikas publishers, New Delhi, 2005.*

17UCA43P	CORE PRACTICAL V: DOTNET PROGRAMMING AND RDBMS	SEMESTER - IV
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Total Credits : 2
Hours per Week : 4

CONTENTS

1. Classes and objects.
2. Events.
3. Generic controls.
4. Advanced controls.
5. Host Website.
6. Validation controls.
7. Queries using DDL and DML.
8. Queries Using Join operation, Sorting and Grouping.
9. Exception.
10. Procedure.
11. Triggers.
12. Database Connectivity .

17UCA4SA	SKILL BASED COURSE II: MOBILE APPLICATION DEVELOPMENT	SEMESTER - IV
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PREAMBLE:

- To introduce Android technology and its applications.
- To understand and implement mobile application activities.
- To inculcate the knowledge on design and develop real time mobile application.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO 1	Define Android Application Development models.	K1
CO 2	Demonstrate User Interface models using SDK.	K2
CO 3	Summarize the Intents, Adapters and Internet.	K2
CO 4	Illustrate File Saving Operations and Database Management.	K2
CO5	Apply GPS, Audio- Video recording techniques and SMS.	K3

Mapping with programme outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO 1	S	M	M	M	M
CO 2	M	M	M	M	S
CO 3	M	S	M	M	S
CO 4	M	M	M	M	S
CO 5	M	M	M	M	M

S-Strong; M-Medium; L-Low

17UCA4SA	SKILL BASED COURSE II: MOBILE APPLICATION DEVELOPMENT	SEMESTER - IV
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Total Credits: 4

Hours per Week: 4

CONTENTS

UNIT - I

Introduction: Android Applications - SDK Features - Framework - Developing for Android - Developing for Mobile devices - Development Tools.

UNIT - II

Creating Applications and Activities: What makes an Android applications? - Externalizing Resources - Android application class - Android activities.

Creating User Interfaces: Design - Views - Layouts - Creating new views - Drawable resources - Resolution and density independence - Menus

UNIT - III

Intents, Broadcast Receivers, Adapters and Internet: Introducing Intents - Adapters - Internet resources - Dialogs - creating an Earthquake viewers.

UNIT - IV

Files, Saving State and Preferences: Saving simple application data - creating and saving preferences - framework - activity state - loading files. **Databases and**

Content Providers: Introduction - SQLite - SQLite Databases - Content providers - Earthquake content provider - Native Android content providers.

UNIT - V

Maps, Geocoding and Location based services: Selecting a location provider-finding your location - Alerts - Geocoder - Map based activities. **Audio,Video using the Camera:** Playing Audio and Video - Recording - Pictures. **Telephony and SMS:** Telephony - SMS and MMS.

TEXT BOOK

1. *Reto Meier*, **Professional Android 2 Application Development**, Wiley India Pvt Ltd. 2011.

REFERENCE BOOKS

1. *Lauren Darcey and Shane Conder*,. **Android Wireless Application Development**, Pearson Education, 2nd Edition, 2011.
2. *Mark L Murphy*, **Beginning Android**, Wiley India Pvt Ltd., 2009.
3. *Sayed Y Hashimi and Satya Komatineni*, **Pro Android**, Wiley India Pvt Ltd. 2009.

17UCA4SP	SKILL BASED LAB II: MOBILE APPLICATION DEVELOPMENT	SEMESTER - IV
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Total Credits: 2
Hours per Week: 4

CONTENTS

1. Font and Colors.
2. Events.
3. Date and Time.
4. Layouts.
5. Multithreading.
6. GPS Applications.
7. Write Data into SD card.
8. Alert Messages.
9. Managing Database.
10. Downloading files.

17UCA53A	CORE IX : DATA COMMUNICATION AND NETWORKS	SEMESTER - V
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PREAMBLE:

- To Understands modes of data transmission, transmission media and network topologies.
- To Remember OSI layers, routing algorithms and ISDN architecture.
- To obtain knowledge on internetworking devices and analyze the problems in internetworking.
- To Remember TCP and UDP communication and application level protocols.

Course Outcomes

On the successful completion of the course, student will be able to

CO Number	CO Statements	Knowledge Level
1	Know about data communications and transmission methods	K2
2	Describe modes of data transmission, transmission media and network topologies	K3
3	Memorize OSI layers, routing algorithms and ISDN architecture	K2
4	Know about internetworking devices and problems in internetworking	K2
5	Remember TCP and UDP communication and classify various application level protocols	K1

Mapping with Programme Outcomes

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	M
CO2	S	S	M	M	M
CO3	M	M	S	S	S
CO4	M	M	M	M	S
CO5	M	S	M	S	S

S: Strong M: Medium L: Low

17UCA53A	CORE IX : DATA COMMUNICATION AND NETWORKS	SEMESTER - V
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Total Credits: 5
Hours per Week: 6

CONTENTS

UNIT - I

Introduction to Data Communications and Networking – Information Encoding – Analog and Digital Transmission Methods.

UNIT - II

Modes of Data Transmission and Multiplexing -**Transmission Errors:** Introduction –Error Classification -Types of error- Error Detection and Correction
Transmission Media: Guided Media, Unguided Media – **Network Topologies:** Mesh, Star, Tree, Ring, Bus – Switching: Circuit switching, Message switching, Packet switching.

UNIT - III

Routing Algorithms: Routers and Routing – Factors affecting Routing Algorithms – Routing Algorithms-Network Protocols and OSI Model- Integrated Services Digital Network (ISDN).

UNIT - IV

Internetworking Concepts: Introduction – The Problems in Internetworking – Internetworking Devices- Introduction to TCP / IP, IP, ARP, RARP, ICMP.

UNIT - V

TCP: Features of TCP, Relationship between TCP and IP, Ports and Sockets, TCP connections, What makes TCP Reliable, TCP Packet Format – **User Datagram**

Protocol (UDP): UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email) – File Transfer Protocol (FTP).

TEXT BOOK

1. *Achyut S.Godbole*. **DATA COMMUNICATIONS AND NETWORKS**, Tata McGraw Hill Publications, 2007.

REFERENCE BOOK

1. *Behrouz A. Forouzan*. **DATA COMMUNICATIONS AND NETWORKING - SECOND EDITION UPDATE**, Tata McGraw-Hill Publication 19th reprint, 2007.
2. *Andrew S. Tanenbaum*, **COMPUTER NETWORKS**, Prentice Hall of India, . 3rd Edition, 2000.

17UCA53B	CORE X: PYTHON PROGRAMMING	SEMESTER - V
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PREAMBLE:

- To learn the basic concepts on data analysis and PYTHON Programming.
- To access data and efficiently manipulate data.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Define Data science concepts using Python.	K1
CO2	Understand the Python Environment and implement its operations.	K2
CO3	Apply the Panda concepts to read and write from different file format.	K3
CO4	Build skills to manipulate data using string functions, aggregate functions.	K3
CO5	Develop a application using Visualization and machine learning techniques.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	S	M	S
CO3	S	S	S	M	M
CO4	S	M	S	S	S
CO5	S	S	S	M	S

S: Strong M: Medium L: Low

17UCA53B	CORE X: PYTHON PROGRAMMING	SEMESTER - V
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Total Credits : 4
Hours per Week: 6

CONTENTS

UNIT - I

Introduction to Data Analysis: Data Analysis - Knowledge domain of Data analyst - nature of data - data analysis process - quantitative and qualitative data analyst - open data - Python and Data analysis.

UNIT - II

Python world: Python - Interpreter - Python2 & Python 3 - installing python - python distributions - using python - python code - IPython - IDEs for Python - SciPy - NumPy -History, Basic Operations.

UNIT- III

Pandas: Reading data in CSV or text files - Reading and writing HTML files - Reading Data from XML - JSON data - Interacting with database - MongoDB.

UNIT - IV

Data Manipulation: Data preparation - concatenation - Data Transformation-string manipulation - data aggregation - group iteration - advanced data aggregation

UNIT - V

Data visualization and Machine Learning: Matplotlib architecture - Pyplot - handling data values - Chart typology. Machine learning - K nearest neighbor classifier - support vector machines.

TEXT BOOK

1. *Fabio Nelli* , **Python Data Analytics** , Apress, 1st Edition, 2015.

REFERENCE BOOK

1. *Wes McKinney* ,**Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython**, O'Reilly, 2011.
2. *Zed Shaw*,**Learn Python the Hard Way**, Addison-Wesley, 3rd Edition ,2014.
3. www.spoken-tutorial.org

17UCA53C	CORE XI: OPERATING SYSTEM	SEMESTER - V
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PREAMBLE:

- To learn the basic concepts on various components and responsibilities of operating system.
- To develop the logic ability to solve the problem efficiently in resource management.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Define operating system and its types.	K1
CO2	Understand the role of operating system as a CPU scheduler.	K2
CO3	Apply the process management through process synchronization and deadlock.	K3
CO4	Build skills to apply virtual memory and memory scheduling.	K3
CO5	Develop problem solving techniques for disk scheduling and file management.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	S	M	S
CO3	S	S	S	M	M
CO4	S	M	S	S	S
CO5	S	S	S	M	S

S: Strong M: Medium L: Low

17UCA53C	CORE XI: OPERATING SYSTEM	SEMESTER - V
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Total Credits : 4
Hours per Week : 6

CONTENTS

UNIT-I

Introduction: What is an OS?-Batch-timesharing-Parallel - real time - distributed process: The Process - Process State - Process Control block-Inter Process Communication.

UNIT-II

CPU Scheduling: CPU/I/O burst cycle-CPU Scheduler-Preemptive Scheduling-Scheduling Criteria-Scheduling Algorithms: First come First served-Shortest job first - Priority -Round Robin.

UNIT III

Process Synchronization: Critical Section - Semaphores-Reading/Writing Problem - Dining Philosopher problem - monitor, Deadlock: Characterization - Prevention -Avoidance - Detection - Recovery.

UNIT-IV

Storage Management System: Logical versus physical Address space-Swapping-Contiguous memory Allocation-Paging-Segmentation-**Virtual Memory:** Demand Paging-Page Replacement Strategies.

UNIT-V

I/O Hardware -Disk Scheduling: FCFS-SSTF-SCAN-CSCAN-Look. **File System:** File Concept-Access Methods-Directory structures.

TEXT BOOK

1. Silber schatz, peter galvin, greg gagne, **Applied Operating System Concepts**, John Wiley & sons Pvt. Ltd, 1st Edition.

REFERNECE BOOKS

1. Achyut S. Godbole, **Operating Systems**, TMH, 1st edition, 1997.
2. Andrew S. Tanenbaum, **Modern Operating Systems**, PHI, 1st Edition.

17UCA53P	CORE PRACTICAL - VI PYTHON PROGRAMMING	SEMESTER - V
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**Total Credits : 2
Hours Per Week: 4**

CONTENTS

1. Arithmetic operations.
2. Arrays.
3. String functions.
4. Mathematical functions.
5. Reading and Writing data from files.
6. Sorting and Ranking.
7. Pyplot application.
8. Types of chart.
9. K nearest neighbor classifier for Diabetes Dataset.
10. SVM using Iris Dataset.

17UCA53Q	CORE PRACTICAL - VII WEB TECHNOLOGY	SEMESTER - V
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**Total Credits : 2
Hours Per Week: 3**

CONTENTS

1. Design the static web pages required for an online book store web site.
2. Use user defined function to get array of values and sort them in ascending order.
3. Demonstrate String and Math Object's predefined methods.
4. Demonstrate Array Objects and Date Object's predefined methods.
5. Exception Handling.
6. Calendar Creation : Display all month.
7. Validation of registration form.
8. Open a Window from the current window.
9. Change color of background at each click of button or refresh of a page.
10. Display calendar for the month and year selected from combo box.

17UCA63A	CORE XII: PHP & MySQL	SEMESTER - VI
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PREAMBLE:

- To learn the necessary knowledge to design and develop dynamic, data-driven & interactive web pages using PHP.
- To develop the PHP framework and syntax, most important techniques used to build dynamic web sites and perform hands on practice with a MySQL database to create database-driven HTML forms.
- To learn and develop various PHP technology applications that definitely meets the current industry needs.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Define the Preliminaries of PHP.	K1
CO2	Remember string and array in PHP.	K1
CO3	Understand tools and functions.	K2
CO4	Build Web Applications using functions & classes, and that manipulate files and directories.	K3
CO5	Develop database connectivity using MySQL and solve various database tasks using the PHP language.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	S	S
CO5	S	M	S	S	S

S: Strong M: Medium L: Low

17UCA63A	CORE XII: PHP & MySQL	SEMESTER - VI
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Total Credits : 5
Hours per Week: 5

UNIT - I

Essential PHP: Enter PHP - Creating your development environment-creating and running first PHP-mixing HTML and PHP - printing some text - adding comments to PHP code - working with variables - creating variables - creating constants - internal data types - Operators - Control Structures : Branching and Looping.

UNIT - II

Strings and Arrays: The string functions, converting to and from strings - formatting text strings - building yourself some arrays - modifying the data in arrays - deleting array elements - **Creating Functions:** Creating function in PHP, Passing functions some data - introducing variable scope in PHP - Accessing global data, working with static variables - PHP conditional functions - PHP variable functions - nesting functions - creating include files - returning errors from functions.

UNIT - III

Reading Data in Web Pages - Setting up web pages to communicate with PHP- handling text fields- handling text areas - handling check boxes - handling radio buttons - handling list boxes -handling password controls - handling hidden controls - handling image maps - handling file uploads - handling buttons.

UNIT - IV

PHP Browser : Handling Power – using PHP server variable, using HTTP Headers- getting browser type, redirecting browsers with HTTP headers- Dumping a form's data all once- Handling form data with custom array- performing data validation- checking the user entered data, requiring numbers- requiring text- persisting user data.

File handling : fopen, feof, fgetc, file_get_contents, reading a file into an array with file, file_exists, filesize, fread, fscanf,, parse_ini_file, getting file info with stat, fseek, copy, unlink, fwrite, reading and writing binary files, fwrite, file_put_contents, locking files.

UNIT - V

Working with databases: What is database, creating a MySQL database- creating a new table- putting data into the new database - accessing the database in PHP- updating databases- inserting into database- deleting records- creating new table- creating new database- sorting your data.

TEXT BOOK

1. *Steven Holzner, COMPLETE REFERENCE PHP*, Tata Mc Graw Hil, 2008.

REFERENCE BOOKS:

1. *Steve Suehring, Tim Converse, Joyce Park, PHP6 MySQL (Bible)*, 2009.
2. *Vikram Vaswani, THE COMPLETE REFERENCE OF MYSQL*, Tata McGraw Hill Publications, 2004.

17UCA63B	CORE XIII: SOFTWARE ENGINEERING	SEMESTER - VI
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PREAMBLE:

- To provide knowledge in the development of software system of high quality and learn about the systematic approach to the design, development, operating and maintenance of quality software products.
- To be able to work with software development within different industrial sectors.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn the systematic approach to design, development of software systems.	K1
CO2	Demonstrate the development process of a software Engineering and Requirement engineering techniques.	K2
CO3	Translate Design engineering Techniques.	K2
CO4	Make use of component design, user interface design and Testing techniques.	K3
CO5	Identify quality of the software management techniques and perform case study.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S: Strong; M: Medium ;L: Low

17UCA63B	CORE XIII: SOFTWARE ENGINEERING	SEMESTER - VI
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Total Credits : 4

Hours per Week: 4

CONTENTS

UNIT - I

Introduction -Evolution - types of software development projects - Changes in Software Development Practices - Computer Systems Engineering. **Software Life Cycle Models:** Classical Waterfall Model - Iterative Waterfall Model - Prototyping Model - Evolutionary Model - Agile Development Models- Spiral Model.

UNIT - II

Software Project Management: Responsibilities of a Software Project Manger - Project Planning - Metrics for Project Size Estimation - Project Estimation Techniques - COCOMO - A Heuristic Estimation Technique - Staff Level Estimation - Scheduling - Organization and Team Structures - Staffing - Risk Management - Software Configuration Management

Requirements Analysis and Specification: Requirements Gathering and Analysis - Software Requirements Specification (SRS) - Formal System Specification .

UNIT - III

Software Design: overview of the Design process- Characteristics of a Software Design - Cohesion and Coupling - Layered Arrangement of modules - Software Design Approaches.

Function-Oriented Software Design: Overview of SA/SD Methodology - Structured Analysis - Data Flow Diagrams(DFDs) - Structured Design - Detailed Design - Design Review. **Object Modeling Using UML:** Basic Concepts-

advantages and Disadvantages of OOD - UML Diagrams - Use Case Model - Class Diagrams - Interaction Diagrams.

UNIT - IV

Coding and Testing: Coding - Code Review - Software Documentation - Testing - UNIT Testing - Black-Box Testing - White-Box Testing - Debugging - Program Analysis Tools - Integration Testing - System Testing.

UNIT - V

Software Reliability and Quality Management: Software Reliability - Statistical Testing - Software Quality - Software Quality Management System - ISO 9000.

Computer Aided Software Engineering: CASE Environment - CASE support in Software Life Cycle - Characteristics of CASE Tools - Second Generation CASE Tool - Architecture of a CASE Environment. **Software Maintenance:**

Characteristics of Software Maintenance - Software Reverse Engineering - Software Maintenance Process Models - Estimation of Maintenance Cost.

Software Reuse: Introduction - Issues in any Reuse Program - Reuse Approach - Reuse at Organization Level.

TEXT BOOK

1. *Rajib Mall*, **Fundamentals of Software Engineering**, Prentice Hall of India Private Limited, 4th Edition, 2014.

REFERENCE BOOKS

1. *Roger S Pressman*, **Software Engineering**, MC Graw-Hill, 6th Edition, 2005.
2. *Dorothy Graham, Erik van Veenendaal, Isabel Evans, Rex Black*, **Foundation of Software Testing**, Len gage learning India Pvt. Ltd., Indian edition, 2007.
3. *Darrel Ince*, **An Introduction to Software Quality Assurance its Implementation**, McGraw Hill Book Company Ltd., 1994.

17UCA63V	CORE XIV: PROJECT WORK	SEMESTER - VI
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Total Credits : 4
Hours per Week: 4

GUIDELINES FOR PROJECT WORK

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Each student should carry out individually one Project Work and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.
- The Project work should be compulsorily done in the college only under the supervision of the Department staff concerned.
- University Exam will be conducted as follows.
- End Semester Viva-Voce.
- Viva-voce will be conducted at the end of VI semester for 100 marks.
- Both the Internal (Respective Guides) and External Examiners (50+50) should Conduct the Viva-Voce Examination at the last day of the practical session.
- Out of 50 marks, 25 for Project Evaluation and 25 for Viva-Voce.
- For awarding a pass, a candidate should have obtained 40% of the Total 100 marks.

17UCA63P	CORE PRACTICAL - VIII: PHP & MySQL	SEMESTER - VI
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Total Credits : 2
Hours per Week: 4

CONTENTS

1. HTML formatted Email in PHP.
2. String function.
3. Control structures.
4. Arrays.
5. Functions.
6. File.
7. Class and objects.
8. Form Validation.
9. User Interface Design to store data in database.
10. Queries in Database.
11. Report Generation.
12. Student personal information system.

17UCA63Q	CORE PRACTICAL-IX: SOFTWARE TESTING	SEMESTER - VI
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Total Credits: 2
Hours per Week: 3

CONTENTS

- 1.Creating your First Selenium IDE script.
- 2.Using Locators in Selenium IDE.
- 3.Enhance a script using Selenium IDE.
- 4.Storing Variables, Echo, Alert, PopUp handling in Selenium IDE.
- 5.Accessing Forms in Webdriver.
- 6.Select Option from DropDown using Selenium Webdriver.
- 7.Accessing Links & Tables using Selenium Webdriver.
- 8.Keyboard & Mouse Event using Action Class in Selenium Webdriver.
- 9.Upload & Download a File using Selenium Webdriver.
- 10.Handling Date Time Picker using Selenium.

17UCA5EA	ELECTIVE - I : WEB TECHNOLOGIES	SEMESTER - V
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PREAMBLE:

- To build XML applications with DTD and style sheets.
- To be able to write server & client side scripts.
- To get proficient in Web Management.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of XML Programming.	K1
CO2	Learn XML Style Sheet.	K1
CO3	Understand the principles of control structures and arrays in JavaScript.	K2
CO4	Build dynamic web page using JavaScript.	K3
CO5	Build Server Side Script with JSP.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	S	S
CO3	S	M	S	S	S
CO4	S	M	S	S	S
CO5	S	M	S	S	S

S: Strong; M: Medium ;L: Low

17UCA5EA	ELECTIVE - I : WEB TECHNOLOGIES	SEMESTER - V
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT - I

TCP/IP Basics - Addressing- Why IP Address? - Logical address - TCP/IP example - Concept of IP Address - ARP - RARP - BOOTP - DHCP - ICMP. TCP Basics - features- TCP and IP - Ports and Sockets - Connection - TCP Connection - What makes TCP reliable? - TCP segment - Format - UDP - UDP Datagram - difference between UDP and TCP.

UNIT - II

FRP - TFTP - History of WWW- Basics of WWW and Browsing - HTML - Web browser - CGI - TELNET.

UNIT - III

JavaScript - Ajax - ASP.NET - Overview - Server controls and Web controls - Validation controls - Database processing - Database programming - ActiveX controls.

UNIT- IV

Java Servlet and JSP - Apache Struts - JSF - EJB. Web security - Introduction - Principles - Cryptography - Plain text and Cipher Text - Digital Certificates - Digital Signature. Network Security - Introduction - Firewalls - IP Security - Virtual Private Networks.

UNIT - V

XML Introduction - XML vs HTML - EDI - XML Terminology - DTD - Document Type Declaration - Element type declarations - Schema - Complex Types- XSLT - Parsing - Web services and Middleware: Middleware concepts- CORBA-RMI- Web services.

TEXT BOOK

1. *Achyut S Godbole and Atul Kahate, Web Technologies*, 2nd Edition , TMH, 2009

REFERENCE BOOKS

1. *A.A.Puntambekar, Web Technologies*, Technical Publications, First Edition, 2009.

2. *Anuranjan Mishra and Arjun Kumar Singh, Introduction to Web Technology*, Laxmi Publications, 1st Edition, 2009.

3. *Kogent Learning Solutions Inc, Web Technologies: Black Book*, Dreamtech Press, 2009.

17UCA5EB	ELECTIVE I: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS	SEMESTER - V
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PREAMBLE:

- To understand the categories of AI Techniques and Expert Systems.
- To inculcate knowledge on expert system concepts and functioning of AI.
- To understand the Problem solving, Search, Heuristic methods.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn Conceptual framework for Artificial intelligence Technique.	K1
CO2	Understand key concept of Searching process.	K2
CO3	Classify different approach for issues in knowledge representation.	K2
CO4	Make use of Predicate Logic.	K3
CO5	Build traditional information systems to be inadequate for addressing expert system.	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	S
CO3	S	M	M	M	S
CO4	S	M	M	M	S
CO5	S	M	M	M	S

S: Strong; M: Medium ;L: Low

17UCA5EB	ELECTIVE I: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS	SEMESTER - V
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT- I

Introduction: AI Problems - AI techniques - Criteria for success. Problems, Problem Spaces, Search: State space search - Production Systems - Problem Characteristics - Issues in design of Search.

UNIT - II

Heuristic Search techniques: Generate and Test - Hill Climbing - Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis.

UNIT- III

Knowledge representation issues: Representations and mappings - Approaches to Knowledge representations - Issues in Knowledge representations - Frame Problem.

UNIT -IV

Using Predicate Logic: Representing simple facts in logic - Representing Instance and Isa relationships - Computable functions and predicates - Resolution - Natural deduction.

UNIT- V

Representing knowledge using rules: Procedural Vs Declarative knowledge - Logic programming - Forward Vs Backward reasoning - Matching - Control knowledge Brief explanation of Expert Systems-Definition- Characteristics-architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.

TEXT BOOK:

1. *Elaine rich and Kelvin Knight, Artificial Intelligence*,Tata McGrawhill Publication, ,2nd Edition ,1991.

REFERENCE BOOK :

1. *Stuart Russell & Peter Norvig*, **Artificial Intelligence a modern Approach**, PHI, 2nd Edition ,2009.
2. *George F Luger* , **Artificial Intelligence** ,TMH, 4th Edition, 2002.

17UCA5EC	ELECTIVE - I : COMPUTER GRAPHICS	SEMESTER - V
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PREAMBLE:

- To provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.
- To form Mathematical Knowledge on Graphics and Technical background of 2D and 3D objects.
- To learn geometric transformation and computer animation.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn methods for basic building blocks of graphics.	K1
CO2	Understand the key concept of two dimensional geometric transformations.	K2
CO3	Apply the knowledge of clipping algorithm.	K3
CO4	Build the procedures for Three-dimensional objects.	K3
CO5	Identify various color models.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	S
CO2	S	M	S	M	S
CO3	S	M	S	S	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S: Strong; M: Medium ;L: Low

17UCA5EC	ELECTIVE - I : COMPUTER GRAPHICS	SEMESTER - V
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT - I

Graphics Output Primitives: Coordinate Reference Frames - Line-Drawing algorithms - Loading frame Buffer - Line function - Circle-Generating algorithms - Ellipse-generating algorithms - other curves.

UNIT - II

Fill-Area Primitives - Polygon Fill Areas - Attributes of Graphics Primitives: Point attributes - Line Attributes - Curve attributes - Fill Area Attributes - Character Attributes. Geometric Transformations: Basic Two Dimensional Geometric Transformations - Matrix Representations and Homogeneous Coordinates - Two Dimensional Composite Transformations - Other Two Dimensional Transformations.

UNIT - III

Two Dimensional Viewing: The Two Dimensional Viewing Pipeline - The Clipping Window - Normalization and Viewport transformations - Clipping Algorithms - Two Dimensional Point Clipping - Two Dimensional Line Clipping: Cohen-Sutherland line Clipping ,Polygon Fill-Area Clipping : Sutherland-Hodgman Polygon Clipping.

UNIT - IV

Three Dimensional Viewing: Overview of Three Dimensional Viewing Concepts - Transformation from World to View Coordinates - Geometric Transformations Three Dimensional Space - Three Dimensional Translation - Three Dimensional Rotation - Three Dimensional Scaling - Composite Three-Dimensional Transformations.

UNIT - V

Color Models and Color Applications : Properties of Light - Color Models - The RGB Color Model - The CMY and CMYK Color Models - The HSV Color Model - The HLS Color Model - Color Selection and Applications - Computer Animation : Raster methods for Computer Animation - Design of Animation Sequences - Traditional Animation Techniques.

TEXT BOOK

1. *Donald Hearn & M. Pauline Baker*, **Computer Graphics with OpenGL**, PHI, 3rd Edition, 2009.

REFERENCE BOOKS

1. *William M. Newman & Robert F. Sproull*, **Principles Of Interactive Computer Graphics**, TMH, 2007.

2. *Krishnamoorth N*, **Introduction to Computer Graphics**, TMH, 6th Edition, 2003.

17UCA6EA	ELECTIVE II: CLOUD COMPUTING	SEMESTER - VI
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PREAMBLE:

- To Critique the consistency of services deployed from a cloud architecture.
- To manage work and personal schedules, edit digital photos and Learn how to use Web-based Applications to collaborate on cloud.
- To Evaluate the deployment of web services from cloud architecture.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn the basics of cloud computing.	K1
CO2	Understand the types of cloud services.	K2
CO3	Outline the cloud computing for family and community.	K2
CO4	Illustrate the collaboration of cloud in various applications.	K2
CO5	Make use of Web based Tools and Services.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	S
CO3	S	M	M	M	S
CO4	S	M	M	S	S
CO5	S	M	M	S	S

S: Strong M: Medium L: Low

17UCA6EA	ELECTIVE II: CLOUD COMPUTING	SEMESTER - VI
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Total Credits : 4

Hours per Week: 5

CONTENTS

UNIT - I

Cloud Computing - History of Cloud Computing - Cloud Architecture - Cloud Storage - Companies in the Cloud Today - Why Cloud Computing Matters - Advantages of Cloud Computing - Disadvantages of Cloud Computing -Who benefits from Cloud Computing .

UNIT -II

Web-Based Application - Pros and Cons of Cloud Service Development - Types of Cloud Service Development - Software as a Service - Platform as a Service - Web Services - On-Demand Computing - Discovering Cloud Services Development Services and Tools - Amazon Ec2 - Google App Engine - IBM Clouds.

UNIT- III

Cloud Computing for the Family: E-Mail, Grocery list, Contact List and Budgets, Sharing photos. Cloud Computing for the Community: Group Projects and Events. Cloud Computing for Corporation: Managing schedules, Contact List, Projects, Reports and Financial Statements.

UNIT - IV

Using Cloud Services: Exploring Online Scheduling Applications: Presdo, windows Live Events, Activity Scheduling. Exploring Online Planning and Task Management: Bla-Bla List, Ta-da List, Tudu List. Collaborating on Event

Management: Payment Processing, Travel Management. Project Management: Project Drive. Word Processing: Google Docs. Spread Sheet: eXpresso. Databases: Blist, Trackvia, Sharing files and other online Content: Amazon s3, Micro Soft Office Live Work Space, WebBased Desktops: ajaxWindows.

UNIT-V

Collaborating via Web-Based Communication Tools - Evaluating Web Mail Services - Evaluating Instant Messaging Services - Evaluating Web Conference Tools - Collaborating via Social Networks and Groupware - Collaborating via Blogs and Wikis.

TEXT BOOK

1. *Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online*, Que Publishing, 2008.

REFERENCE BOOKS

1. *Kumar Saurabh, Cloud Computing - Insights into New Era Infrastructure*, Wiley Indian Edition, 2011.
2. *Kaittwang Geoffrey C.Fox and Jack J Dongrra, Elsevier, Distributed and Cloud Computing*, 2012.
3. *Raj Kumar Buyya, Christian Vecchiola and S.Tanurai Selvi. Mastering Cloud Computing*, TMH, 2013.

17UCA6EB	ELECTIVE II: BUSINESS INTELLIGENCE	SEMESTER - VI
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PREAMBLE:

- Be exposed with the basic rudiments of business intelligence system understand the modeling aspects behind Business Intelligence.
- Be exposed with different data analysis tools and techniques.
- Understand of the business intelligence life cycle and the techniques used in it .

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Explain the fundamentals of business intelligence.	K1
CO2	Explain the data analysis and knowledge delivery stages.	K2
CO3	Apply various modeling techniques.	K2
CO4	Apply business intelligence methods to various situations.	K2
CO5	Demonstrate the BI feature and Text analytics.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	M	S	S	S
CO3	S	M	S	M	S
CO4	S	M	M	S	S
CO5	S	M	S	S	S

S: Strong M: Medium L: Low

17UCA6EB	ELECTIVE II: BUSINESS INTELLIGENCE	SEMESTER - VI
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Total Credits : 4

Hours per Week: 5

CONTENTS

UNIT - I

BUSINESS INTELLIGENCE: Effective and timely decisions – Data, information and knowledge – Role of mathematical models – Business intelligence architectures: Cycle of a business intelligence analysis – Enabling factors in business intelligence projects – Development of a business intelligence system – Ethics and business intelligence.

UNIT - II

KNOWLEDGE DELIVERY: The business intelligence user types, Standard reports, Interactive Analysis and Ad Hoc Querying, Parameterized Reports and Self-Service Reporting, dimensional analysis, Alerts/Notifications, Visualization: Charts, Graphs, Widgets, Scorecards and Dashboards, Geographic Visualization, Integrated Analytics, Considerations: Optimizing the Presentation for the Right Message.

UNIT - III

EFFICIENCY: Efficiency measures – The CCR model: Definition of target objectives- Peer groups – Identification of good operating practices; cross efficiency analysis – virtual inputs and outputs – Other models. Pattern matching – cluster analysis, outlier analysis.

UNIT - IV

BUSINESS INTELLIGENCE APPLICATIONS: Marketing models – Logistic and Production models – Case studies.

UNIT - V

FUTURE OF BUSINESS INTELLIGENCE: Future of business intelligence – Emerging Technologies, Machine Learning, Predicting the Future, BI Search & Text Analytics – Advanced Visualization – Rich Report, Future beyond Technology.

TEXT BOOK

1. *Efraim Turban, Ramesh Sharda, Dursun Delen, Decision Support and Business Intelligence Systems*, Pearson, 9th Edition, 2013.

REFERENCE BOOKS

1. *Larissa T. Moss, S. Atre, Business Intelligence Roadmap: The Complete Project Lifecycle of Decision Making*, Addison Wesley, 2003.
2. *Carlo Vercellis, Business Intelligence: Data Mining and Optimization for Decision Making*, Wiley Publications, 2009.
3. *David Loshin Morgan, Kaufman, Business Intelligence: The Savvy Manager's Guide*, Second Edition, 2012.

17UCA6EC	ELECTIVE II: MOBILE COMMUNICATIONS	SEMESTER - VI
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PREAMBLE:

- To inculcate knowledge on Mobile Computing.
- To understand of mobile technologies and how these technologies are utilized and integrated to meet specific business needs.
- To understand current technologies and architectures that provides the network and communications infrastructure for mobile-enabled enterprise computer systems.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn the basic concepts of Mobile Computing.	K1
CO2	Understand the mobile computing architecture.	K2
CO3	Compare the different types of emerging technologies in mobile computing.	K2
CO4	Illustrate the modern network technology GPRS and its Applications.	K2
CO5	Identify CDMA,3G, Wi-Fi applications.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	S
CO3	S	M	M	M	S
CO4	S	M	M	S	S
CO5	S	M	M	S	S

S: Strong M: Medium L: Low

17UCA6EC	ELECTIVE II: MOBILE COMMUNICATIONS	SEMESTER - VI
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Total Credits : 4

Hours per Week: 5

CONTENTS

UNIT - I

Introduction: Mobility of Bits and Bytes -Wireless The Beginning - Mobile Computing - Dialogue Control - Networks - Middleware and Gateways - Application and services- Developing Mobile computer Applications - security in mobile computing - Standards _ Why is it necessary - Standard bodies. MOBILE COMPUTING ARCHITECTURE: History of computers and Internet - Architecture for mobile computing - Three-tier architecture - Design considerations for mobile computing - Mobile computing through Internet - Making exiting applications mobile enabled.

UNIT - II

MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony - Multiple access procedures - Mobile computing through telephone - IVR Application - Voice XML - TAPI.

UNIT - III

EMERGING TECHNOLOGIES: Blue Tooth - RFID - WiMAX - Mobile IP - IPv6 - Java Card. GSM : Global System for mobile communications - GSM Architecture - GSM Entities - Call routing in GSM - PLMN Interfaces - GSM Addresses and Identifiers - Network Aspects in GSM - GSM Frequency allocations - Authentications and Security-SMS.

UNIT - IV

GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Application for GPRS- Limitations – Billing and Charging. WAP : MMS – GPRS Applications.

UNIT - V

CDMA and 3G: Spread spectrum technology – Is 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802.11 standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor networks – Wireless LAN Security – WiFi vs 3G.

TEXT BOOK

1. *Asoke K Talukder & Roopa R Yavagal, Mobile Computing*, TMH, 2nd Edition, 2010.

REFERENCE BOOK

1. *Raj Kamal, Mobile Computing*, Oxford Higher Education, 2nd Edition, 2007.

17UCA6ED	ELECTIVE III: INTERNET OF THINGS	SEMESTER - VI
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CONTENTS

PREAMBLE:

- To understand basic concepts of Internet of Things.
- To understand the methodologies, data analytics and physical servers of IoTs.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	To learn the basics of IoT.	K1
CO2	Relate IoT with M2M.	K2
CO3	Build IoT platform design methodologies.	K3
CO4	Illustrate IoT Physical Servers and Cloud offerings.	K2
CO5	Make use of Data Analytics of IoT.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	M
CO2	S	M	S	S	M
CO3	S	M	S	S	M
CO4	S	M	S	S	S
CO5	S	M	M	S	M

S: Strong; M: Medium ;L: Low

17UCA6ED	ELECTIVE III: INTERNET OF THINGS	SEMESTER - VI
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT - I

Introduction of Internet of Things (IoT): Introduction, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels & Deployment Templates. IoT Applications for Home, Industry, Agriculture, Health & Lifestyle.

UNIT - II

IoT and M2M: M2M, Differences and similarities between M2M and IoT, SDN and NFV for IoT. IoT System Management with NETCONF-YANG: NETCONF, YANG, IoT Systems Management with NETCONF-YANG.

UNIT - III

IoT Platforms Design Methodology: IoT Design Methodology. IoT Physical Devices & Endpoints: Basic building blocks of an IoT device, Rapsberry Pi, Rapsberry Pi interfaces, Other IoT devices.

UNIT - IV

IoT Physical Servers & Cloud Offerings : Cloud Storage Models & Communication APIs, Web Application Messaging Protocol (WAMP), Xively cloud for IoT,, Amazon Web Services for IoT. Studies Illustrating - Smart Lighting, Smart Parking, Weather Reporting Bot, Forest Fire Detection, IoT Printer.

UNIT - V

Tools for IoT : Introduction, chef, chef case studies, puppet- puppet case study - Multi-tier Deployment, NETCONF-YANG Case Studies. IoT Code Generator.

TEXT BOOK:

1. *Arshdeep Bahga & Vijay Madisetti*, **Internet of Things**, Universities Press (India) Private Limited, 2015.

REFERENCE BOOK:

1. *Olivier Hersent and David Boswarthick*, **The Internet of Things**, John Wiley & Sons Ltd., 2015.

17UCA6EE	ELECTIVE III : CLIENT SERVER COMPUTING	SEMESTER - VI
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CONTENTS

PREAMBLE:

- To understand the basic concepts of client server communication techniques.
- To learn and analyze the server operating system networking functions.
- To implement the client -server applications.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals ideas of Client Server Computing.	K1
CO2	Demonstrate the Components of Client / Server Applications Connectivity.	K2
CO3	Apply the connectivity in the Components of Client / Server Applications.	K3
CO4	Develop the Client / Server Software & Hardware.	K3
CO5	Explanation about the Components of Client / Server Applications Service and Support.	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	M
CO2	S	M	M	M	S
CO3	S	M	M	S	M
CO4	S	M	S	M	S
CO5	M	S	M	S	S

S: Strong; M: Medium ;L: Low

17UCA6EE	ELECTIVE III : CLIENT SERVER COMPUTING	SEMESTER - VI
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Total Credits:4

Hours Per Week: 5

CONTENTS

UNIT - I

Advantages of Client / Server Computing -Technology Revolution -Connectivity
-Ways to improve Performance -How to reduce network Traffic.

UNIT - II

Components of Client / Server Applications. The Client: Role of a Client -Client Services -Request for Service. Components of Client / Server Applications -The Server The Role of a Server - Server Functionality in Detail -The Network Operating System -What are the Available Platforms -The Server Operating system.

UNIT - III

Components of Client / Server Applications Connectivity: Open System Interconnect - Communications Interface Technology -Inter -process communication -WAN Technologies.

UNIT - IV

Components of Client / Server Development-Software: Components of Client / Server Development -Hardware.

UNIT - V

Components of Client / Server applications Service and Support: System Administration. The Future of Client / Server Computing: Enabling Technologies - Transformational Systems.

TEXT BOOK

1. *Patrick Smith, Steve guengerich, Client Server Computing*, PHI, 2ndedition. (Chapters 2-8 & 10).

REFENCE BOOK

1. *Robert Orfali, Dan Harkey, Jeri Edwards, The Essential Client/Server Survival Guide*, Galgotia publication private limited, 2nd Edition.
2. *Dewire and Dawana Travis, Client/ Server Computing*, TMH.

17UCA6EF	ELECTIVE III: DATA MINING	SEMESTER - VI
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CONTENTS

PREAMBLE:

1. To understand basic concepts, tasks, methods, and techniques in data mining.
2. To provide a comprehensive introduction to techniques in data mining and knowledge discovery.
3. To understanding of the data mining process and issues, learn various techniques for data mining, and apply the techniques in solving data mining problems using data mining tools and systems.

Course Outcomes

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

CO Number	CO Statements	Knowledge Level
CO1	Be familiar and Learn the fundamentals ideas of Data Mining.	K1
CO2	Classify the Techniques in Data Mining.	K2
CO3	Understand the classification.	K2
CO4	Construct the clustering algorithms.	K3
CO5	Build Association rules in algorithms.	K3

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S: Strong; M: Medium ;L: Low

17UCA6EF	ELECTIVE III: DATA MINING	SEMESTER - VI
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Total Credits: 4
Hours Per Week: 5

CONTENTS

UNIT-I

Basic Data Mining Tasks - Data Mining Versus Knowledge Discovery in Data Bases - Data Mining Issues - Data Mining Metrics - Social Implications of Data Mining - Data Mining from Data Base Perspective.

UNIT-II

Data Mining Techniques - a Statistical Perspective on data mining - Similarity Measures - Decision Trees - Neural Networks - Genetic Algorithms.

UNIT- III

Classification: Introduction - Statistical - Based Algorithms - Distance Based Algorithms - Decision Tree - Based Algorithms - Neural Network Based Algorithms - Rule Based Algorithms - Combining Techniques.

UNIT-IV

Clustering : Introduction - Similarity and Distance Measures - Outliers - Hierarchical Algorithms . Partitional Algorithms.

UNIT-V

Association Rules: Introduction - Large Item Sets - Basic Algorithms - Parallel & Distributed Algorithms - Comparing Approaches - Incremental Rules - Advanced Association Rules Techniques - Measuring the Quality of Rules.

TEXT BOOK

1. *Margaret H.Dunhabam*, **Data Mining Introductory and Advanced Topics**, Pearson Education, 2003.

REFERENCE BOOK

1. *Jiawei Han & Micheline Kamber*, **Data Mining Concepts & Techniques**, Academic Press, 2001.

17UNM34M	NMEC I: ADVANCED EXCEL LAB	SEMESTER - III
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Total Credits : 2
Hours Per Week : 2

CONTENTS

1. Understanding Basic Excel.
2. Formatting.
3. Working with formulas.
4. Working with Functions.
5. Data Sorting.
6. Advanced Filters.
7. Conditional Formatting.
8. Managing Windows.
9. Data Forms.
10. Pivot Tables and Charts.

17UNM44M	NMEC II : ADOBE PHOTOSHOP LAB	SEMESTER - IV
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Total Credits: 2
Hours Per Week: 2

CONTENTS

1. Basic Photo editing.
2. Web Page with links.
3. Text formatting.
4. Background Design.
5. Custom shapes creation.
6. Layer properties.
7. Animate objects.
8. Morphing.
9. Designing Cover page.
10. Pamphlet designing.

17UCASS1	SELF STUDY COURSE I: PROGRAM LOGIC AND COMPUTER FUNDAMENTALS	SEMESTER III
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Total Credit : 1

PREAMBLE:

- Mastering digital principles and fundamentals of computer.
- Understand the program logic and flow of process.
- To know the types of systems, multimedia techniques and office package.

CONTENTS

UNIT - I

Introduction to Computer - Computer System Hardware - Computer Memory.

UNIT - II

Input and Output Devices - Interaction of user and computer.

UNIT - III

Computer Programming fundamentals - Internet and Internet services.

UNIT - IV

Information Systems - Multimedia.

UNIT - V

Ms-Word 2007 - Ms-Excel 2007 - Ms -Powerpoint 2007.

TEXT BOOK

1. *Anita Goel*, **Computer Architecture**, Pearson Publications, 1st Edition, 2010.

REFERENCE BOOK

1. *V. Rajaraman, Fundamental of Computers*, Prentice- Hall India Ltd., New Delhi, 2014.
2. *Sinha, P.K, Computer Fundamentals*, New Delhi: BPB Publications, 2007.
3. *Dubey, Manoj, P C Packages*, Indore : Kamal Prakashan Publications, 2013.

17UCASS2	SELF STUDY COURSE II: SOFT SKILLS	SEMESTER III
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Total Credit : 1**PREAMBLE:**

- To develop effective communication skills.
- To become self-confident individuals by mastering inter-personal skills, team management skills, and leadership skills.
- To develop broad career plans, evaluate the employment market, identify the organizations to get good placement, match the job requirements and skill sets.

CONTENTS**UNIT - I**

Nature of technical communication : Stages of communication - Channels of communication - Nature of technical communication - Importance and need for technical communication - Technical communication skills.

UNIT - II

The Listening process : Types of listening - Listening with a purpose - Barriers to listening - The speech process - Conversion and oral skills - Body language.

UNIT - III

Job interviews : Pre -interview preparation techniques - Interview questions - Answering strategies - Frequently asked interview questions - Projecting a positive image - Alternative interview Formats.

UNIT - IV

Group Discussion : Nature of group discussion - Characteristics of successful group discussions - Selection group discussion - Group discussion strategies - Techniques for individual contribution Group interaction strategies.

UNIT - V

Presentation Skills : Planning the presentation - Preparing the Presentation - Organizing your presentation - Rehearsing the presentation - Improving delivery.

TEXT BOOK

1. *M. Ashraf Rizvi*, **Effective Technical Communication**, Tata McGraw Hill Publishing Company Limited, New Delhi.