BACHELOR OF COMPUTER APPLICATIONS
REGULATIONS

ELIGIBILITY

A candidate who has passed in Higher Secondary Examination with Mathematics or Business Mathematics or Computer Science or Statistics (Academic stream or Vocational stream) as one of the subject under Higher Secondary Board of Examination, Tamilnadu as per norms set by the Government of Tamilnadu or an Examination accepted as equivalent thereto by the syndicate, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the **Bachelor of Computer Application degree examination** of this university after a course of study of three academic years.

DURATION OF THE COURSE

The course shall extend over a period of three years comprising of six semesters with two semesters in one academic year. There shall not be less than 90 working days for each semester. Examination shall be conducted at the end of every semester for the respective subjects.

OBJECTIVE OF THE COURSE

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. Demonstrating a substantial understanding of concepts in key areas of Computer Science and its Applications.
2. Carrying out the required analysis and synthesis involved in Computer Systems, Information Systems and Computer Applications.
3. Demonstrating professional competence in developing software and in its design and implementation.
4. To Train and equip the students to meet the requirements of the corporate.
5. To stimulate an interest in computing as an academic discipline with a view to encouraging progression to research.

SCHEME OF EXAMINATION

Course	Subject	Hrs of Instruction	Exam Duration (Hrs)	Max Marks			Credit Points
				CA	CE	Total	
First Semester							
Part I							
15UTALB101/ 15UHILB101/ 15UMMLB101/ 15UFRLB101	Tamil I/ Hindi I/ Malayalam I/ French I	5	3	25	75	100	3
Part II							
15UENLB101	General English I	5	3	25	75	100	3
Part III							
15UCAM101	Core I: Introduction to Information Technology	4	3	25	75	100	3
15UCAM102	Core II : Programming in C	6	3	25	75	100	5
15UMACAA101	Allied I: Basic Mathematics	5	3	25	75	100	4
15UCAMP101	Core Practical I: Programming in C	2	3	40	60	100	2
Part IV							
15UVE101	Value Education I: Yoga	2	3	25	75	100	2
		29				**700**	**22**
Second Semester							
Part I							
15UTALB201/ 15UHILB201/ 15UMMLB201/ 15UFRLB201	Tamil II/ Hindi II/ Malayalam II/ French II	5	3	25	75	100	3
Part II							
15UENLB201	General English II	5	3	25	75	100	3
Part III							
15UCAM201	Core III: Computer Ethics	4	3	25	75	100	3
15UCAM202	Core IV: Object Oriented Programming with C++	6	3	25	75	100	5
15UMACAA201	Allied II: Algebra and Calculus	5	3	25	75	100	4
15UCAMP201	Core Practical II : Programming in C++	2	3	40	60	100	2
Part IV							
15UVE201	Value Education II: Environmental Studies	2	3	25	75	100	2

		29				**700**	**22**
Third Semester							
Part III							
15UCAM301	Core V: Programming in Java	5	3	25	75	100	5
15UCAM302	Core VI: Data Structures	5	3	25	75	100	4
15UCAM303	Core VII: Computer Organization and Architecture	5	3	25	75	100	4
15UCCCAA301	Allied III : Principles of Accountancy	5	3	25	75	100	3
15UCAMP301	Core Practical III: Programming in Java	2	3	40	60	100	2
15UCCCAAP301	Allied Practical I: Accounting Package I	2	3	40	60	100	2
Part IV							
15UCASBC301	SBC I:Technical Skills I (C & C++) (100% Internal Evaluation and online)	1	2	100	-	100	2
	NMEC I	2	3	25	75	100	2
Non Credit							
15ULS301	Career Competency Skills I	1	-	-	-	-	-
		28				**800**	**24**
	Diploma*						
Fourth Semester							
Part III							
15UCAM401	Core VIII: Relational Database Management Systems	5	3	25	75	100	5
15UCAM402	Core IX: Operating Systems (100% External Evaluation)	5	3	-	100	100	4
15UCAM403	Core X: Principles of Software Engineering	5	3	25	75	100	4
15UCCCAA401	Allied IV: Cost and Management Accounting	5	3	25	75	100	3
15UCAMP401	Core Practical IV: RDBMS Package	2	3	40	60	100	2

15UCCCAAP401	Allied Practical II: Accounting Package II	2	3	40	60	100	2
Part IV							
15UCASBC401	SBC II: Technical Skills II (JAVA & Data Structures) (100% Internal Evaluation and online)	1	2	100	-	100	2
	NMEC II	2	3	25	75	100	2
Non Credit							
15ULS401	Career Competency Skills II	1	-	-	-	-	-
		28				**800**	**24**
	Diploma*						
Fifth Semester							
Part III							
15UCAM501	Core XI: Programming in .NET	6	3	25	75	100	5
15UCAM502	Core XII: Mobile Communications	6	3	25	75	100	5
15UCAM503	Core XIII: Computer Networks	6	3	25	75	100	5
	Elective I: (Self study & 100% Internal Evaluation)	-	3	100	-	100	5
15UCAMP501	Core Practical V: Programming in .NET	2	3	40	60	100	2
15UCAPR601	Project & Viva-Voce (Evaluation at VI Semester)	5**	-	-	-	-	-
Part IV							
15UCASBCP501	SBC III: Software Testing tools (Practical only)	3	3	40	60	100	2
Part V							
15UCAE501	Extension Activity	-	-	-	-	-	2
		28				**600**	**26**
Sixth Semester							
Part III							

15UCAM601	Core XIV: Computer Graphics	6	3	25	75	100	5
15UCAM602	Core XV: Open Source Technology	6	3	25	75	100	5
	Elective II	6	3	25	75	100	5
15UCAMP601	Core Practical VI: Open Source Technology	2	3	40	60	100	2
15UCAPR601	Project & Viva-Voce	5**	3	40	60	100	5
Part IV							
15UCASBCP601	SBC IV: Computer Hardware and Networking (Practical only)	3	3	40	60	100	2
		28				**600**	**24**
					Grand Total	**4200**	**142**

*** Students have to undergo a Diploma Course during the Second year of their course of study.**

**** Project hours can be divided into two such as 1. Problem presentation in the Class room 2. Problem implementation in the Lab.**

ELECTIVE I

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

S.No	Subject Code	Subject
1.	15UCAEL501	E-Commerce
2.	15UCAEL502	Internet and Web Services
3.	15UCAEL503	Software Project Management

ELECTIVE II

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

S.No	Subject Code	Subject
1.	15UCAEL601	Principles of Information Security
2.	15UCAEL602	Cloud Computing
3.	15UCAEL603	Data Mining

NON MAJOR ELECTIVE COURSE

- The department offers the following two subjects as Non Major Elective Course for other than the computer science students for third and fourth semesters.

S.No	Semester	Subject Code	Subject
1	III	15UCSN301	Internet Technology
2	IV	15UCSN401	HTML and Web Designing

DIPLOMA COURSES

(Student shall select any one of the following Diploma Course during their third semester and complete the course at the end of fourth semester)

S.No	Subject Code	Name of the Diploma Course	Total Duration
1	15UCAD401	Diploma in Animation	90 Hours with 2 Semesters (Each semester 45 hours)
2	15UCAD402	Diploma in Office Automation and DTP	90 Hours with 2 Semesters (Each semester 45 hours)
3	15UCAD403	Diploma in Network Infrastructure Design	90 Hours with 2 Semesters (Each semester 45 hours)

FOR COURSE COMPLETION

Students shall complete:

- Language subjects (Tamil/Malayalam/French/Hindi, English) in I and II semester.
- Value Education Yoga and Environmental Studies in I and II semester respectively.
- Allied subjects in I, II, III and IV semesters.
- Online Mode Examinations for SBC I and SBC II in III & IV semester respectively
- One Diploma course in the second year of their course of study.
- Two Non Major Elective Course in the Second Year III and IV semester respectively
- Self study subjects and subjects by internal evaluation from the core subjects in the respective Semesters.
- Extension activity in V semester.
- Elective subjects in the V and VI semesters.
- An In-House project at the end of VI semester, but they have to carry out their Project work from V Semester onwards.
- Subject with 100% External evaluation from the core subjects in the respective semester.

Total Credit Distribution

Subjects	Credits	Total		Credits	Cumulative Total
Part I: Language	3	2x 100 =	200	06	12
Part II: General English	3	2x 100 =	200	06	
Part III:					
Core	5	9 x 100	900	45	112
	4	4 x 100 =	400	16	
	3	2 x 100 =	200	06	
Elective I(Self Study & Internal Evaluation)	5	1 x 100 =	100	05	
Elective II	5	1 x 100 =	100	05	
Core Practical	2	6 x 100 =	600	12	
Project & Viva-Voce	5	1 x 100 =	100	05	
Allied	4	2 x 100 =	200	08	
Allied Theory	3	2 x 100 =	200	06	
Allied Practical	2	2 x 100 =	200	04	
Part IV:					
SBC: 1.Technical Skills I (C & C++) (100% Internal Evaluation and online)	2	1 x 100 =	100	02	16
2. Technical Skills II (JAVA & Data Structures) (100% Internal Evaluation and online)	2	1 x 100 =	100	02	
3. Software Testing Tools (Practical only)	2	1 x 100 =	100	02	

4.Computer Hardware and Networking (Practical only)	2	1 x 100 =	100	02	
Value Education : 1.Yoga	2	1 x 100 =	100	02	
2. Environmental Studies	2	1 x 100 =	100	02	
NMEC	2	2 x 100 =	200	04	
Part V:					
Extension Activity	2			02	2
Total			**4200**	**142**	**142**

15UCAM101/ 15UCSM101	CORE I: INTRODUCTION TO INFORMATION TECHNOLOGY	SEMESTER - I

Total Hours: 30

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Major components of Computer System and its working principles.
2. Role of an Operating System and basic terminologies of networks.
3. How the Information Technology aids for the Current Scenario.

CONTENTS

UNIT - I **(6 Hours)**

Introduction: Characteristics of Computers-Technological Evolution of Computers-The Computer Generations- Categories of Computer. **Data and Information:** Introduction - Types of Data - A Simple Model of a Computer - Data Processing Using a Computer - Desktop Computer. **Acquisition of Number and Textual Data:** Introduction-Input Units - Internal Representation of Numeric Data – Representation of Characters in Computers – Error-Detecting Codes.

UNIT - II **(6 Hours)**

Data Storage: Introduction - Memory Cell - Physical Devices Used as Memory Cells -Random Access Memory - Read Only Memory - Secondary Memory - Floppy Disk Drive - Compact Disk Read Only Memory (CDROM) - Archival Memory. **Central Processing Unit:** The Structure of a Central Processing Unit- Specification of a CPU - Interconnection of CPU with Memory and I/O Units.

UNIT - III **(6 Hours)**

Computer Networks: Introduction - Local Area Network (LAN) - Applications of LAN - Wide Area Network (WAN) – The Future of Internet Technology. **Output Devices:** Introduction - Video Display Devices - Flat Panel Displays – Printers.

UNIT - IV **(6 Hours)**

Computer Software: Introduction - Operating System - Programming Languages – A Classification of Programming Languages. **Data Organization:** Introduction - Organizing a Database - Structure of a Database - Database Management System - Example of Database Design.

UNIT - V **(6 Hours)**

Some Internet Applications: Introduction - E-mail - Information Browsing Service - The World Wide Web - Information Retrieval from the World Wide Web - Other Facilities Provided by Browsers - Audio on the Internet. **Societal Impacts of Information Technology:** Careers in Information Technology.

TEXT BOOKS:

1. *Rajaraman, V*. 2008. **Introduction to Information Technology.** [Sixth Printing]. Prentice Hall of India Pvt. Limited, New Delhi.(UNIT I to V)
2. *Nagpal, D.P*. 2010. **Computer Fundamentals**. [First Edition, Revised]. S.Chand & Company Ltd, New Delhi. (**UNIT I** (**Introduction: Characteristics of Computers to Categories of Computer**))

REFERENCE BOOKS:

1. *ITL Educations Solution Limited.* 2009. **Introduction to Computer Science**. [Fourth Impression]. Pearson Education, New Delhi.
2. *Alexis Leon and Mathews Leon.* 1999. **Fundamentals of Information Technology.** [First Edition]. Leon TECHWorld, New Delhi.

15UCAM102/ 15UCSM102	CORE II: PROGRAMMING IN C	SEMESTER - I

Total Hours:50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamentals of Programming through C.
2. How to solve the given problem in the form of coding by using C.

CONTENTS

UNIT - I **(10 Hours)**

Overview of C: History of C - Importance of C – Sample Programs - Basic Structure of C Programs- Executing a 'C' program. **Constants, Variables, and Data Types :** Introduction - Character Set - C Tokens - Keywords and Identifiers - Constants - Variables - Data Types - Declaration of Variables – Declaration of Storage Class- Assigning Values to Variables- Defining Symbolic Constants - Overflow and Underflow of Data. **Operators and Expressions**: Arithmetic Operators- Relational Operators- Logical Operators- Assignment Operators- Increment and Decrement Operators- Conditional Operator- Bitwise Operators- Special Operators - Arithmetic Expressions- Evaluation of Expressions- Precedence of Arithmetic Operators - Type Conversions in Expressions- Mathematical Functions.

UNIT - II **(10 Hours)**

Managing Input and Output Operations: Introduction- Reading a Character - Writing a Character - Formatted Input- Formatted Output. **Decision Making and Branching:** Decision making with IF statement– Simple IF statement – The IF…..ELSE statement– Nesting of IF…..ELSE statements– The ELSE IF Ladder - The Switch Statement– The ?: Operator– The GOTO Statement. **Decision Making and Looping:** Introduction- The WHILE statement– The DO statement– The FOR statement - Jumps in LOOPS.

UNIT - III **(10 Hours)**

Arrays: Introduction– One-Dimensional Arrays - Declaration of One-Dimensional Arrays - Initialization of One-Dimensional Arrays – Two- Dimensional Arrays - Initializing Two-Dimensional Arrays– Multi-Dimensional Arrays- Dynamic Arrays. **Character Arrays and Strings:** Introduction- Declaring and Initializing String Variables- Reading Strings from Terminal- Writing Strings to Screen- Arithmetic Operations on Characters- Putting Strings Together- Comparison of Two Strings- String Handling Functions.

UNIT - IV **(10 Hours)**

User-defined Functions: Need for User-Defined Functions- A Multi-Function Program - Elements of User-Defined Functions - Definition of Functions - Return Values and their Types - Function Calls - Function Declaration - Category of Functions - No Arguments and No Return Values – Arguments but No Return Values – Arguments with Return Values – No Arguments but Returns a Value – Functions that Return Multiple Values - Nesting of Functions - Recursion - Passing Arrays to Functions - Passing Strings to Functions – The Scope, Visibility and Lifetime of Variables. **Structures and Unions:** Introduction- Defining a Structure - Declaring Structure Variables - Accessing Structure Members - Structure Initialization - Copying and Comparing Structure Variables - Operations on Individual Members - Array of Structures - Arrays within Structures - Structures within Structures - Structures and Functions - Unions - Size of Structures - Bit Fields.

UNIT - V **(10 Hours)**

Pointers: Introduction- Understanding Pointers- Accessing the Address of a Variable- Declaring Pointer Variables- Initialization of Pointer Variables- Accessing a Variable through its Pointer- Chain of Pointers- Pointer Expressions- Pointer Increments and Scale Factor- Pointers and Arrays- Pointers and Character Strings- Array of Pointers- Pointers as Function Arguments- Functions Returning Pointers- Pointers to Functions- Pointers and Structures. **File Management in C:** 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. **The Preprocessor:** Introduction- Macro Substitution- File Inclusion- Compiler Control Directives.

TEXT BOOK:

1. *Balagurusamy, E*. 2010. **Programming in ANSI C.** [Fifth Edition]. Tata Mc-Graw Hill, New Delhi.

REFERENCE BOOKS:

1. *Suresh Srivastava,* K. 1999. **C in Depth**. [First Edition]. BPB Publications, New Delhi.
2. *Yashavant Kanetkar*. 1999**. Let Us C**. [Third Edition]. BPB Publications, New Delhi.
3. *Thamarai Selvi, S. and Murugesan, R*. 1999. **C for all**. [First Edition]. Anuradha Agencies, Kumbakonam.
4. *Jeyapoovan, T.* 2007. **A First Course in Programming with C**. [Second Edition]. Vikas Publishing House Pvt. Ltd., New Delhi.

15UMACAA101	**ALLIED I: BASIC MATHEMATICS** **(For B.Sc., Computer Science , BCA , B.Sc., Electronics and Communication)**	**SEMESTER – I**

Total Hours: 50

Note: Proof of theorems and proof of examples are excluded.

OBJECTIVES:

1. To learn the basic concepts about sets and Relations
2. To study in detail about straight line.
3. To study Numerical methods which are used to solve Algebraic equations.

CONTENTS

UNIT – I **(10 Hours)**

Set Theory: Introduction – Sets – Types of sets – Cardinality of a Set – Subset and Superset – Power set – Operations on Sets - Applications.
Chapter – 2 (Section 2 to 2.4, 2.6, 2.7)

UNIT – II **(10 Hours)**

Relations: Binary relations – Inverse Relations – Types of Relations – Types of Relations and Relation Matrix – Equivalence Relation – Partial order relation – Closures of relation.
Chapter – 3 (Section 3.1, 3.2, 3.11 to 3.14, 3.16)

UNIT – III **(10 Hours)**

Straight Line: Equations of a straight line passing through two given points – Equations of a straight lines in terms of the intercepts it makes on the axes – Other forms of a equation of a straight lines – Point of intersection of two straight lines.
Chapter – 2 (Section 1, 2, 7, 8)

UNIT – IV **(10 Hours)**

Solution of Numerical Algebraic and transcendental Equations: Bisection Method – False position method – Iteration method – Newton-Raphson method (Problems only).
Chapter – 3 (Section 3.1 to 3.4)

UNIT – V **(10 Hours)**

Algebraic Equations: Gauss Elimination method – Gauss Jordan method – Gauss seidal method – Inversion of matrix by using Gauss Elimination method and Cramer's rule (Problems Only).
Chapter – 4 (Section 4.2, 4.3, 4.9)

TEXT BOOKS:

1. *Acharja Sree Kumar.* 2005. **Fundamental approach to Discrete Mathematics**. [First Edition]. New Age International Publishers, New Delhi.
2. *Manicavachagom Pillai, T.K. and Natarajan, T.* 2000. **Analytical Geometry of Two Dimensions**. Viswanathan Printers and Publishers Ltd.
3. *Kandasamy, P., Thilagavathy, K. and Gunavathi, K.* 2001. **Numerical Methods**. [Third Edition]. S.Chand and Company Ltd., New Delhi.

15UCAMP101/ 15UCSMP101	CORE PRACTICAL I: PROGRAMMING IN C	SEMESTER – I

LIST OF PRACTICAL:

1. Program to print the statement using Backslash Character Constant.
2. Program to read a data from the Keyboard.
3. Program to illustrate the working of Branching Statements.
4. Program to illustrate the working of Looping Statements.
5. Program to highlight the Relational and Logical Operations.
6. Program using Arrays.
7. Program to Find the Factorial of a given Number using Recursion.
8. Program to Compute the Employee Payroll Details using Structure.
9. Program to Reverse the String using Pointers.
10. Program to Calculate the Sum of Two Numbers using Pointers to Functions.
11. Program for Creation and Processing of Sequential Files for Mark List Preparation.
12. Program to Print the N Characters from m^{th} position in the File.

15UVE101	VALUE EDUCATION I: YOGA மனவளக்கலையோகா	SEMESTER - I

Total Hours: 30

CONTENTS

UNIT - I **(6 Hours)**

YOGA AND PHYSICAL HEALTH

1:1 Physical Structure -Three bodies - Five limitations

1:2 Simplified Physical Exercises - Hand Exercises - Leg Exercises - Breathing Exercises – eye Exercises - Kapalapathi

1:3 Maharasanas 1-2 – massages – acu-puncture – Relaxation

1:4 Yogasanas - Suriya Namaskar – Padamasana –Vajrasanas – Chakrasanas (Side) – Viruchasanas – Yoga muthra –Patchimothasanas -Ustrasanas – Vakkarasanas Salabasanas.

UNIT - II **(6 Hours)**

ART OF NURTURING THE LIFE FORCE AND MIND

2:1 Maintaining the youthfulness - postponing the ageing process

2:2 Sex and spirituality – significance of sexual vital fluid – Married Life –Chastity.

2:3 Ten Stages of Mind

2:4 Mental Frequency – Methods for Concentration

UNIT - III **(6 Hours)**

SUBLIMATION

3:1 Purpose and Philosophy of life

3:2 Introspection – Analysis of Thought

3:3 Moralization of Desires

3:4 Neutralization of Anger

UNIT - IV **(6 Hours)**

HUMAN RESOURCES DEVELOPMENT

4:1 Eradication of worries

4:2 Benefits of Blessings

4:3 Greatness of Friendship

4:4 Individual Peace and World Peace

UNIT - V **(6 Hours)**

LAW OF NATURE

5:1 Unified Force – Cause and Effect System

5:2 Purity of thought and Deed and Genetic Centre

5:3 Love and Compassion

5:4 Cultural Education – Five fold Culture

TEXT BOOK:

1. Manavalakalai Yoga – World Community Service Center
   Vethathiri Pathippagam,
   156, Gandhij Road, Erode – 638 001.
   PH: 0424 – 2263845.

REFERENCE BOOKS:

1. Yoga for Modern Age
2. Journey of Consciousness
3. Simplified Physical Exercises – World Community Service Center
   Vethathiri Pathippagam,
   156, Gandhij Road, Erode – 638 001.
   PH: 0424 – 2263845.

15UCAM201	CORE III: COMPUTER ETHICS	SEMESTER – II

Total Hours : 30

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamentals of Computer Ethics.
2. Social Impact of Computers in the Information Society.

CONTENTS

UNIT - I **(6 Hours)**

What is Computer Ethics?: Technology and Ethics– Computer Ethics and Morality– Ethical Decision Making in Computing. **Ethical Issues**: **Computer Crime and Security:** What is Computer Crime?– Who are the Computer Criminals?– Computer Fraud– Hackers and Hacking– Computer Sabotage– Security, Legislation and Education.

UNIT - II **(6 Hours)**

Ethical Issues: **Privacy and Anonymity**: Invasion of Privacy– The Right of Privacy– Methods of Privacy Violation– Surveillance Technologies– Protecting Privacy. **Intellectual Property:** The Problem of Information Ownership– Arguments For and Against Property– Intellectual Property Rights– Protecting Intellectual Property– Software Piracy– Free Software.

UNIT - III **(6 Hours)**

Ethical Issues: Computer Reliability: Can we Trust Computers?- What is Computer Reliability?– Professional Responsibility– Solutions to the Problem. **Social Impact: Intelligent Machines:** Artificial Intelligence- Applications- Robotics.

UNIT - IV **(6 Hours)**

Social Impact: Computers and Business: Computerised Workplaces– Telecommuting– Electronic Business. **Computers and Health:** Technostress– Medical Robots– Telemedicine. **Computers and Education:** Future Schools– School Surveillance– Electronic Learning.

UNIT - V **(6 Hours)**

Social Impact: Computers and Entertainment: Virtual Reality– Computer Games. **Computers and Politics:** Internet Democracy– Electronic Government – Electronic Voting– Environmental Problems.

TEXT BOOK:

1. *Giannis Styamatellos,* 2007. **Computer Ethics A Global Perspective.** [First Edition]**.** Jones and Bartlett Publishers, Sudbury, MA, USA.

REFERENCE BOOKS:

1. *Deborah Johnson, G and Keith Miller*, W. 2009. **Computer Ethics**. [Third Edition]. Pearson Education Ltd., New Delhi.

2. *Marsha Cook Woodbury*. 2003. **Computer and Information Ethics**. [First Edition]. Stipes Publishing L.L.C., Illinois.

15UCAM202/ 15UCSM202	CORE IV: OBJECT ORIENTED PROGRAMMING WITH C++	SEMESTER – II

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamental idea of Object Oriented Programming.
2. Programming skills using C++.

CONTENTS

UNIT - I **(10 Hours)**

Principles of Object-Oriented Programming: A look at Procedure-Oriented programming -Object Oriented Programming paradigm - Basic concepts and Benefits of Object Oriented Programming - Object Oriented Languages– Applications of OOP. **Beginning with C++:** What is C++? - More C++ statements- structure of C++ program. **Tokens, Expressions and Control Structures**: Introduction- Tokens –Keywords- Identifiers and Constants –Basic Data Types – User Defined Data Types –Derived Data Types -Symbolic Constants- Operators in C++ - Scope Resolution Operator- Member Dereferencing Operators –Memory Management Operators-Manipulators- Expressions and their Types- Operator Overloading- Operator Precedence-Control Structures.

UNIT - II **(10 Hours)**

Functions in C++: Introduction- The Main Function- Function Prototyping- Call by Reference- Return by Reference—Inline functions – default Arguments-Const Arguments-Function Overloading-Friend and Virtual Functions. **Classes and Objects**: Introduction- Specifying a class - Defining Member functions – Making an Outside Function Inline-Nesting of member functions - Private member functions- Memory allocation for objects - Static data members - Static member functions – Arrays of Objects - Friendly functions - Const member functions.

UNIT - III **(10 Hours)**

Constructors and Destructors: Introduction – Constructors- Parameterized Constructor - Multiple constructors in a class - Constructor with Default Arguments - Dynamic initialization of objects - Copy and dynamic constructors –Destructors. **Operator overloading and Type Conversions**: Introduction- Defining operator overloading -Overloading unary and binary operators – Rules for Overloading Operators.

UNIT - IV **(10 Hours)**

Inheritance: Extending Classes: Introduction-Defining Derived classes - Single inheritance - Making a private member inheritable – Multilevel Inheritance- Multiple inheritance - Hierarchical inheritance - Hybrid inheritance - Virtual base classes - Abstract classes - Member classes: Nesting of classes. **Pointers, Virtual Functions and Polymorphism**: Introduction- Pointers to objects-Virtual Functions-Pure Virtual Functions.

UNIT - V **(10 Hours)**

Managing console I/O operations: Introduction – C++ streams – C++ Stream classes – Unformatted I/O operations – Formatted console I/O operations – Managing output with manipulators. **Working with Files**: Introduction- classes for file stream operations- Opening and Closing a file – Detecting end of file- More about Open(): File modes- File pointers and their Manipulations- Sequential input and output operations- updating a file: random access- Error handling during file operations- Command line arguments. **Templates:** Introduction-Class Templates-Class Templates with Multiple Parameters-Function Templates- Function Templates with Multiple Parameters.

TEXT BOOK:

1. *Balagurusamy, E.* 2010. **Object Oriented Programming with C++**. [Fourth Edition]. Tata McGraw Hill Education Pvt. Limited, New Delhi.

REFERENCE BOOKS:

1. *Robert Lafore.* 1994. **Object Oriented Programming in C++**. [Third Edition]. Galgotia Publications Pvt. Limited, New Delhi.
2. *Ashok Kamthane, N.* 2008. **Object Oriented Programming with ANSI & Turbo C++**. [Fourth Impression]. Pearson Education, India.

15UMACAA201	**ALLIED II: ALGEBRA AND CALCULUS** **(For B.Sc., Computer Science , BCA , B.Sc., Electronics and Communication)**	**SEMESTER – II**

Total Hours: 50

Note: Proof of the theorem and proof of examples are excluded.

OBJECTIVES:

To learn about advanced properties of matrices.

To learn various methods of solving algebraic equations and manipulation of roots.

To learn basic concepts of differentiation and integration.

CONTENTS

UNIT – I **(10 Hours)**

Matrices: Rank of a Matrix – Eigen Values and Eigen vectors – Cayley Hamilton Theorem.

UNIT – II **(10 Hours)**

Theory of Equations: Imaginary and Irrational Roots – Relation between roots and co-efficient (Problems based on A.P, G.P, and H.P)

UNIT – III **(10 Hours)**

Differentiation: Differential co-efficient of a sum or difference – Product rule – Quotient Rule – Function of function rule.

UNIT – IV **(10 Hours)**

Successive differentiation: The n^{th} derivative – Leibnitz formula for n^{th} derivative of a product.

UNIT – V **(10 Hours)**

Methods of integration: Integrals of functions involving $\sqrt{a^2+x^2}$ – Integration by parts – Bernoulli's formula.

TEXT BOOK:

1. *Vittal, P.R*. 2002. **Allied Mathematics**. [Third Edition]. Margham Publications, Chennai.

REFERENCE BOOKS:

1. *Manicavachagom Pillay, T.K., Natarajan, T. and Ganapathy, K.S.* 2010. **Algebra (Vol-II)**. S.Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai. (For UNIT - I).

2. *Manicavachagom Pillay, T.K., Natarajan, T and Ganapathy, K.S.* 2010. **Algebra (Vol-I).** S.Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai. (For UNIT - II).

3. *Manicavachagom Pillay, T.K. and Narayanan, S.* 2010. **Calculus (Vol-I) (Differential Calculus)**. S.Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai. (For UNIT - III & IV).

4. *Manicavachagom Pillay, T.K. and Narayanan, S.* 1997. **Calculus (Vol-II) (Integral Calculus).** S.Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai. (For UNIT - V).

15UCAMP201/ 15UCSMP201	CORE PRACTICAL II: PROGRAMMING IN C++	SEMESTER – II

LIST OF PRACTICAL:

1. Program for Classes and Objects.
2. Program for Classes and Objects using Scope Resolution Operator.
3. Program for Inline functions.
4. Program for Friend functions.
5. Program for Function Overloading.
6. Program using Constructor and Destructor.
7. Program using Operator Overloading.
8. Program using Pure Virtual Function.
9. Program for Multiple Inheritance.
10. Program for Hybrid Inheritance.
11. Program for File operations.
12. Program using Templates.

15UVE201	VALUE EDUCATION II: ENVIRONMENTAL STUDIES	SEMESTER - II

Total Hours: 30

CONTENTS

UNIT - I **(6 Hours)**

Environment – Definition – Scope – Structure and function of ecosystems- producers, consumers and decomposers- Energy flow in the ecosystem - Ecological succession – food chain, food webs and ecological pyramids – Concept of sustainable development.

UNIT - II **(6 Hours)**

Natural resources: Renewable - air, water, soil, land and wildlife resources. Non – renewable – Mineral coal, oil and gas. Environmental problems related to the extraction and use of natural resources.

UNIT - III **(6 Hours)**

Biodiversity – Definition – Values – Consumption use, productive social, ethical, aesthetic and option values threats to bio diversity – hotspots of bio diversity – conservation of bio - diversity: in – situ Ex – situ. Bio – wealth - National and Global level .

UNIT - IV **(6 Hours)**

Environmental Pollution : Definition – causes, effects and mitigation measure s – Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution – Nuclear hazards – Solid wastes acid rain – Climate change and global warming environmental laws and regulations in India – Earth summit.

UNIT - V **(6 Hours)**

Population and environment – Population explosion – Environment and human health – HIV/AIDS – Women and Child welfare – Resettlement and Rehabilitation of people, Role of information technology in environmental health – Environmental awareness.

TEXTBOOK:

1. Department of Biochemistry. Environmental Studies (Study Material). Published by K.S.Rangasamy College of Arts & Science (Autonomous). Tiruchengode

REFERENCE BOOK:

1. *Erach Bharucha*. 2005. **Textbook of Environmental studies**. Universities press. PVT. Ltd.

15UCAM301/ 15UCSM301	CORE V: PROGRAMMING IN JAVA	SEMESTER - III

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. The fundamental idea of Object Oriented Programming.
2. Programming skills using Java.

CONTENTS

UNIT - I **(10 Hours)**

Java Evolution: Java History – Java Features- How Java differs from C and C++- Java and Internet – Java and World Wide Web- Web Browsers. **Overview of Java Language:** Simple Java program- Java program Structure- Java Tokens- Java Statements – Java Virtual Machine. **Constants, Variables and Data Types**: Constants- Variables -Data Types- Declaration of Variables –Giving values to variables- Scope of variables- Symbolic Constants- Type casting- Getting value of variables- Standard and default values.

UNIT - II **(10 Hours)**

Operators and Expressions: Introduction- Arithmetic Operators- Relational Operators- Logical Operators- Assignment Operators- Increment and Decrement Operators- Conditional Operators- Bitwise Operators- Special Operators- Arithmetic Expressions- Evaluation of Expressions- Precedence of Arithmetic operators- Type conversions in Expressions- Operator Precedence and Associativity -Mathematical functions. **Decision Making and Branching:** Decision making with if Statement- Simple if Statement- The if..Else statement- Nesting of if..else Statements- The Else if Ladder- The Switch Statement- The ?: Operator. **Decision Making and Looping:** The while Statement- The do Statement- The for Statement- Jumps in Loops-Labeled Loops.

UNIT - III **(10 Hours)**

Classes, Objects and Methods: Introduction-Defining a Class-Fields Declaration-Methods Declaration-Creating Objects-Accessing Class Members-Constructors-Methods Overloading-Static Members-Nesting of Methods-Inheritance: Extending a Class-Overriding Methods-Final Variables and Methods-Final Classes-Finalizer Methods-Abstract Methods and Classes-Methods with Varargs-Visibility Control. **Arrays, Strings and Vectors:** Introduction – One-dimensional Arrays-Creating an Arrays- Two-dimensional Arrays–Strings- Vectors-Wrapper Classes- Enumerated Types. **Interfaces**: **Multiple Inheritance** Introduction-Defining Interfaces-Extending

Interfaces-Implementing Interfaces-Accessing Interface Variables. **Packages**: **Putting classes Together:** Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-Accessing a Package-Using a Package-Adding Class to a Package-Hiding Classes-Static Import.

UNIT - IV **(10 Hours)**

Multithreaded Programming: Introduction-Creating Threads-Extending the Thread Class- Stopping and Blocking a Thread-Life Cycle of Thread- Using Thread Methods-Thread Exception-Thread Priority-Synchronization-Implementing the 'Runnable' Interface. **Managing Errors and Exceptions:** Introduction-Types of Errors-Exceptions-Syntax of Exception Handling Code-Multiple Catch Statements-Using Finally Statement-Throwing Our Own Exceptions-Using Exception for Debugging. **Applet Programming:** Introduction –How Applets Differ from Applications-Preparing to Write Applets-Building Applet Code-Applet Life Cycle- Creating an Executable Applet-Designing a Web Page-Applet Tag-Adding Applet to HTML File-Running the Applet-More About Applet Tag-Passing Parameters to Applets-Aligning the Display-More about HTML Tags-Displaying Numerical Values-Getting Input from the User.

UNIT - V **(10 Hours)**

Graphics Programming: Introduction-The Graphics Class-Lines and Rectangles-Circles and Ellipses-Drawing Arcs-Drawing Polygons-Line Graphs-Using Control Loops in Applets-Drawing Bar Charts. **Managing Input/Output Files in Java**: Introduction- Concepts of Streams- Stream Classes – Byte Stream classes- Character stream classes- Using streams – Other Useful I/O Classes – Using the File Class – Input/output Exceptions – Creation of Files – Reading / Writing Characters-Reading / Writing Bytes -Handling Primitive Data Types – Random Access Files.

TEXTBOOK:

1. *Balagurusamy, E.* 2008**. Programming With Java – A Primer**. [Third Edition]. Tata McGraw-Hill, New Delhi.

REFERENCE BOOKS:

1. *Hebert Schild***.** 2002**. The Complete Reference Java 2.** [Fifth Edition]. Tata McGraw-Hill. New Delhi.
2. *John Hubbard, R.* 2004. **Programming With Java.** [Second Edition]. Tata McGraw-Hill, New Delhi.
3. *Debasish Jana***.** 2005. **Java and Object-Oriented Programming Paradigm**. [Second Printing]. Prentice-Hall of India, New Delhi.

15UCAM302/ 15UCSM302	CORE VI: DATA STRUCTURES	SEMESTER – III

Total Hours : 50

(Note: Excluding programs)

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamental conception of Data Structures.
2. Development of applications using algorithms.

CONTENTS

UNIT - I **(10 Hours)**

Introduction to Data Structures: Introduction-Types of Data Structures-Abstract Data Type- Time and Space Complexity- Big-Oh Notation. **Arrays:** Introduction-Declaration of Arrays-Accessing Array Elements- Storing Values in Arrays-Calculating the Length of an Array -Operations on Arrays -Two-dimensional Arrays-Multi- dimensional Arrays. **Linked Lists:** Introduction - Linked List Versus Arrays – Memory Allocation and De-Allocation for a Linked List.

UNIT - II **(10 Hours)**

Linked Lists: Singly Linked List- Polynomial Representation- Circular Linked List-Doubly Linked List.

UNIT - III **(10 Hours)**

Stacks and Queues: Stacks- Array Representation of Stacks- Operation on a Stack-Linked Representation of Stack- Operations on a Linked Stack- Infix, Postfix and Prefix Notation- Evaluation of an Infix Expression- Convert Infix Expression to prefix Expression-Applications of stack- **Queues:** Array Representation of Queues-Circular Queue- Linked Representation of Queue- Operation on a Queue- Deque - Priority Queues – Multiple Queues.

UNIT - IV **(10 Hours)**

Trees: Binary Trees-Expression Trees- Traversing of a Binary Tree- **Efficient Binary Trees:** Binary search Trees- Operations on Binary Search Trees. **Graphs:** Introduction- Representation of Graphs- Graph traversal Algorithms.

UNIT – V **(10 Hours)**

Graphs: Shortest Path Algorithms- Minimum Spanning Tree- Prim's Algorithm- Kruskal's Algorithm- Dijkstra's Algorithm-Applications of Graphs. **Sorting and Searching :** Introduction- Bubble Sort- Insertion Sort- Selection Sort- Merge Sort- Quick Sort– Heap Sort - Searching.

TEXT BOOK:

1. *Reema Thareja.* 2012. **Data Structures Using C.** [Second Impression]. Oxford University Press, New Delhi.

REFERENCE BOOKS:

1. *Yashavant P. Kanetkar. 2003.* **Data Structures Through C.** [Second Edition]. BPB Publications, NewDelhi.
2. *Seymour Lipschutz.* 2010. **Data Structures with C.** [First Edition]. McGraw Hill, International Editions, Schaum's Outline Series, New Delhi.
3. *Brijendra Kumar Hoshi*. 2010. **Data Structures and Algorithms in C**. [First Edition]. TataMcGrawHill Education Private Limited, New Delhi.
4. *G.A.V.Pai.* 2008. **Data Structures and Algorithms: Concepts, Techniques and Applications.** [First Edition]. McGraw Hill, International Editions, New Delhi.

15UCAM303	CORE VII: COMPUTER ORGANIZATION AND ARCHITECTURE	SEMESTER – III

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Hardware operation of digital computers.
2. How the various digital components used in organization and design of digital computers.

CONTENTS

UNIT - I **(10 Hours)**

Digital Logic Circuits: Digital Computers – Logic Gates – Boolean algebra – Map simplification – Combinational Circuits. Flip–Flops – Sequential Circuits.

UNIT - II **(10 Hours)**

Digital components: Integrated Circuits – Decoders- Multiplexers – Registers- Shift Registers - Binary Counters - Memory Unit. **Data representation:** Data Types - Complements- Fixed Point Representation - Floating Point Representation – Other Binary Codes - Error Detection Codes.

UNIT - III **(10 Hours)**

Register Transfer and Microoperations: Register Transfer Language - Register Transfer – Bus and Memory Transfers - Arithmetic Microoperations - Logic Microoperations - Shift Microoperations– Arithmetic Logic Shift Unit – Hardware Description Languages.

UNIT - IV **(10 Hours)**

Central Processing Unit: Introduction – General Register Organization - Stack Organization - Instruction formats - Addressing Modes – Data Transfer and Manipulation – Program Control - Reduced instruction Set Computer (RISC): CISC Characteristics - RISC Characteristics.

UNIT - V **(10 Hours)**

Pipeline and Vector Processing: Parallel Processing – Pipelining – Arithmetic Pipeline – Instruction Pipeline – RISC Pipeline – Vector Processing – Array Processors.

TEXT BOOK:

1. *Morris Mano, M.* 1996. **Computer System Architecture.** [Third edition]. Prentice Hall of India Pvt. Ltd., New Delhi.

REFERENCE BOOKS:

1. *Navin Kumar***.** 2005. **Computer Organization.** [First edition]. Galgotia Publications Pvt. Ltd.
2. *Badri Ram. 1999*. **Fundamentals of Microprocessors and Microcomputers.** [Fourth revised and enlarged edition]. Dhanpat Rai Publication Pvt. Ltd.
3. *William Stallings***.** 1997. **Computer Organization and Architecture.** [Fourth edition]. Prentice-Hall India, New Delhi.
4. *Aditya P Mathur***.** 1995. **Introduction to Microprocessors.** [Third edition]. Tata McGraw Hill Publishing Company Ltd, New Delhi.

15UCCCAA301	**ALLIED III:** **PRINCIPLES OF ACCOUNTANCY**	**SEMESTER - III**

Total Hours: 50

Note: Distribution – Problem 80% and Theory 20%

OBJECTIVES:

Motive behind this paper is to provide:

1. Basic knowledge about accounting system and providing an edge over various terminologies of accounting.
2. To lay a foundation to understand accounting software without any difficulty.

CONTENTS

UNIT- I **(10 Hours)**

Introduction - Advantages and limitations of accounting - Accounting concepts and conventions - Journal - Ledger - Subsidiary books - Cash book, Purchase book, Sales book - Trail balance.

UNIT - II **(10 Hours)**

Final Accounts of a Sole Trader (Trading Account, Profit and Loss Account & Balance sheet) with adjustments

UNIT - III **(10 Hours)**

Average Due Date – meaning - Advantages of Average due Date - Calculation of Average Due Date - Meaning and need for Account Current - Red ink interest rate - Problems on Account Current

UNIT - IV **(10 Hours)**

Bank Reconciliation Statement – Difference between Pass Book and Cash book - Favourable Bank Balance and Unfavourable bank Balance – Preparation of Bank Reconciliation Statement based on Bank Pass Book and Cash Book.

UNIT - V **(10 Hours)**

Depreciation on fixed assets – Causes of Depreciation - Methods of Depreciation – Problems on Straight line Method – Calculation of Profit / Loss on Sale of Assets - Problems on Written down value method.

TEXT BOOK:

1. *Reddy, T.S and Murthy, A*. 2012. **Financial Accounting**. [Seventh Edition]. Margham Publications, Chennai.

REFERENCE BOOKS:

1. *Gupta, R.L and Gupta, V.K.* 2007. **Financial Accounting**. [Ninth Edition]. Sultan Chand & Sons, New Delhi
2. *Jain, S.P and Narang, K*. 2005. **Financial Accounting.** [Fifth Edition]. Kalyani Publishers. Ludhiana.
    1. *Shukla, M.C, and Grewal, T.S.* 2007. **Advanced Accountancy.** [Fifth Edition]. S.Chand & Co., New Delhi.

15UCAMP301/ 15UCSMP301	CORE PRACTICAL III: PROGRAMMING IN JAVA	SEMESTER - III

LIST OF PRACTICALS:

1. Program using Control statements (IF and Looping Statements).
2. Program using Array.
3. Program using Command Line arguments.
4. Program using Class and Object.
5. Program using Inheritance and Overriding.
6. Program for creating User Defined Package.
7. Program using Interface concept.
8. Program for Exception Handling.
9. Program for Multithreading.
10. Program using Applet.
11. Program Using Graphics Methods.
12. Program using Files.

15UCCCAAP301	**ALLIED PRACTICAL I:** **ACCOUNTING PACKAGE I**	**SEMESTER - III**

LIST OF PRACTICAL:

1. Company creation in Tally, Saving the company profile, Alteration / deletion of company.
2. Creation, Alteration / Deletion of Groups and Ledger accounts.
3. Feeding of Stock Value and opening balances of Assets and Liabilities.
4. Preparation of Contra and Journal vouchers
5. Preparation of Cash Receipt and payment vouchers
6. Preparation of Purchases and Sales vouchers
7. Preparation of Debit Note and Credit Note
8. Voucher Modification ,Voucher alteration, deletion and cancellation
9. Displaying voucher list, Day book, Ledger and Extracting Daybook Summaries
10. Extracting detailed Trial Balance
11. Extracting Profit and Loss Account: Detailed form and Vertical Form
12. Extracting Balance Sheet: Primary Balance Sheet and Detailed Balance Sheet

15UCASBC301/ 15UCSSBC301	SBC I: Technical Skills I (C & C++)	SEMESTER - III

Total Hours: 15

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Problem solving skills
2. Debugging

CONTENTS

UNIT - I **(3 Hours)**

Variables and Expressions – Basic Input/Output – Control Structures

UNIT - II **(3 Hours)**

Functions - Arrays and Strings – Pointers

UNIT - III **(3 Hours)**

Structures and Unions - Files- Preprocessor

UNIT - IV **(3 Hours)**

Introduction to OOP – Functions- Classes in C++

UNIT - V **(3 Hours)**

Inheritance – Virtual Functions – Input/ Output in C++ - Templates

REFERENCE BOOKS:

1. *Venugopal K.R., Chandrakant.N* 2012. **C Test your Aptitude.** [Sixth Reprint]. Tata McGraw-Hill Publications, New Delhi.
2. *Yashavant Kanetkar*. 2002**. Test your C++ Skills**. [First Edition]. BPB Publications, New Delhi.
3. *Balagurusamy, E*. 2010. **Programming in ANSI C.** [Fifth Edition]. Tata Mc-Graw Hill, New Delhi.

4. *Yashavant Kanetkar*. 1999**. Let Us C**. [Third Edition]. BPB Publications, New Delhi.
5. *Balagurusamy, E.* 2010. **Object Oriented Programming with C++**. [Fourth Edition]. Tata McGraw Hill Education Pvt. Limited, New Delhi.
6. *Ashok Kamthane, N.* 2008. **Object Oriented Programming with ANSI & Turbo C++**. [Fourth Impression]. Pearson Education, India.

15ULS301	CAREER COMPETENCY SKILLS I	SEMESTER – III

Total Hours: 15

OBJECTIVE:

To enhance employability skills and to develop career competency

CONTENTS

UNIT – I **(3 Hours)**

Speed Maths: Squaring of Numbers - Multiplication of Numbers - Finding Square Roots - Finding Cube Roots - HCF, LCM - Decimals - - Averages - Powers and Roots.

UNIT – II **(3 Hours)**

Problems on ages- Ratio and proportion- Chain rule-Percentages- Simple and Compound Interest.

UNIT – III **(3 Hours)**

Time and Work- Time and Distance- Problems on Trains

UNIT – IV **(3 Hours)**

Analogies - Sentence Formation - Sentence Completion - Sentence Correction - Idioms & Phrases - Jumbled Sentences-- Reading Comprehension –Deriving conclusions

UNIT – V **(3 Hours)**

Tenses- Articles and Preposition - Change of Voice - Change of Speech - Synonyms & Antonyms - Phrasal Verbs-One Word Substitution- Odd Man Out - Spelling & Punctuation

15UCAM401/ 15UCSM401	CORE VIII: RELATIONAL DATABASE MANAGEMENT SYSTEMS	SEMESTER - IV

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamentals of Database Management.
2. Relational Database Management System.

CONTENTS

UNIT - I **(10 Hours)**

Introduction: Database System Applications-Purpose of Database Systems - View of Data - Database languages - Data Storage and Querying: Storage Manager and Query Processor -Database Architecture - Database users and Administrators. **Relational Databases**: Introduction to the Relational Model: Structure of Relational Databases- Keys.

UNIT - II **(12 Hours)**

Introduction toSQL: SQL Data Definition- Basic Structure of SQL Queries- Set Operations- Aggregate Functions- Nested Sub queries: Set Membership and Set Comparison - Modification of the Database **Intermediate SQL**: Views- Integrity Constraints- Authorization: Grant –Revoke- Roles.**Database Design: Database Design and the E-R Model**: The Entity-Relationship Model- Entity-Relationship Diagrams- Extended E-R Features: Specialization- Generalization.

UNIT - III **(10 Hours)**

Data Normalization: Introduction- Functional Dependencies- Normalization- First Normal Form(1NF)- Second Normal Form(2NF), Third Normal Form(3NF)- Boyce-Codd Normal Form (BCNF), Fourth Normal Form(4NF)- Fifth Normal Form(5NF)- Denormalization. **Transaction Management and Concurrency Control**: Introduction- Transactions- Transaction Properties (ACID)- Transaction States - Concurrency Control-The COMMIT Command- The ROLLBACK Command – The SAVEPOINT Command .

UNIT - IV **(10 Hours)**

Storage and File Structure: Overview of Physical Storage Media - RAID- File Organization - Organization of Records in Files. **PL/SQL: A Programming Language:** Fundamentals of PL/SQL -PL/SQL Block Structure – Comments – Data Types – Variable Declaration – Assignment Operation – Bind Variables. **More on PL/SQL: Control Structures and EmbededSQL :** Control Structures – Nested Blocks – SQL in PL/SQL.

Unit – V **(08 Hours)**

PL/SQL Cursors and Exceptions: Cursors – Implicit Cursors – Explicit Cursors – Explicit Cursor Attributes – Implicit Cursor Attributes – Cursor FOR Loops**. PL/SQL Named Blocks: Procedure, Function, Package, and Trigger:** Procedures – Functions – Triggers.

TEXT BOOKS:

1. *Abraham Silberschatz, Henry Korth, F.andSudarsham, S.* 2006. **Database System Concepts.** [Sixth Edition]. Tata McGraw Hill, New Delhi. (UNIT I, II, IV(Storage and File Structure chapter only))
2. *Alexis Leoan and Mathews Leon.* 2006. **Essentials of Database Management Systems.** Vijay Nicole Imprints Private Limited, Chennai. (UNIT III)
3. *Nilesh Shah* 2010.**Database Systems Using Oracle - A Simplified Guide to SQL and PL/SQL**. [Second Edition]. Pearson Education, New Delhi. (Unit IV(except Storage and File Structure chapter) and V)

REFERENCE BOOKS:

1. *Date, C.J.* 1995. **An Introduction to Database Systems.** [Sixth Edition]. Addison Wesley, USA.
2. *Raghu Ramakrishnan and Johannes Gehrke.* 2003. **Database Management Systems.** [Third Edition]. Tata Mc-GrawHill, New Delhi.

15UCAM402/ 15UCSM402	CORE IX:OPERATING SYSTEMS	SEMESTER – IV

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. System performance and behavior of OS impacting on entire machine.
2. The challenges in large and complex system functions.

CONTENTS

UNIT - I **(10 Hours)**

Overview: Introduction: Computer-System Organization- Computer System Architecture – Operating-System Structure- Operating System operations-Process Management - Memory Management - Storage Management - Protection and Security. **Operating-System Structures:** Operating-System Services - Types of System Calls - System Programs –Operating-System Design and Implementation – Operating-System Structure. **Process Management**: **Processes:** Process Concept - Process Scheduling - Interprocess Communication.

UNIT - II **(10 Hours)**

Threads: Multithreading Models. **Process Synchronization: C**ritical-Section Problem – Semaphores – Classical Problems of Synchronization. **CPU Scheduling:** Basic Concepts - Scheduling Criteria and Algorithms. **Deadlocks**: Deadlock Characterization - Methods for Handling Deadlocks - Deadlock Prevention, Avoidance and Detection - Recovery from Deadlock.

UNIT - III **(10 Hours)**

Memory Management: Main Memory: Background – Segmentation – Paging -- Structure of the Page Table. **Virtual Memory:** Demand Paging - Page Replacement - Thrashing.

UNIT - IV **(11 Hours)**

Storage Management: **Mass-Storage Structure:** Disk Structure –Disk Scheduling - RAID Structure. **File-System Interface:** File Concept - Access Methods - Directory and Disk Structure-Protection. **File-System Implementation:** Allocation Methods - Free-Space Management. **I/O Systems**: Kernel I/O Subsystem.

UNIT - V **(10 Hours)**

Protection and Security: Protection: Domain of Protection - Access Matrix - Implementation of the Access Matrix**. Security:** The Security Problem - Program Threats - System and Network Threats - User Authentication - Firewalling to Protect Systems and Networks. **Case Study**: Windows 7, Android (Open Source): Android Overview.

TEXT BOOKS :

1. *Abraham Silberschatz, Peter Baer Galvin and Greg Gagne*. 2013. **Operating System Concepts.** [Ninth Edition]. Wiley Edition.
2. *Marko Gargenta, Masumi Nakamura. 2014. Learning Android.[Second Edition].O'Reilly,USA.[**Case study**: Android (open source) – Unit V]*

REFERENCE BOOKS:

1. *William Stallings*. 2004. **Operating Systems – Internals & Design Principles.** [Fifth Edition]. Prentice – Hall of India Pvt. Ltd., New Delhi. Prentice – Hall of India P.Ltd., New Delhi.
2. *Andrew Tannenbaum*, S. 2011. **Modern Operating Systems.** [Third Edition]. Prentice-Hall of India, New Delhi.

15UCAM403	CORE X: PRINCIPLES OF SOFTWARE ENGINEERING	SEMESTER – IV

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. System Development Strategies
2. Software Testing
3. Project Management and Quality Management

CONTENTS

UNIT - I **(10 Hours)**

Introduction : Professional Software Development - Software Engineering - Software Engineering Diversity – Software Engineering Ethics. **Software Processes**: Software Process Models : The Waterfall Model - Incremental Development-Reuse-Oriented Software Engineering .**Process Activities :** Software Specification – Software Design and Implementation – Software Validation – Software Evolution .**Coping with Change** : Prototyping**-** Incremental Delivery – Bohem's Spiral Model – The Rational Unified Process.

UNIT – II **(10 Hours)**

Agile Software Development : Agile Methods – Extreme Programming. **Requirements Engineering :** Functional and Non Functional Requirenets – Software Requirements Document – Requirements Specification – Requirements Engineering Processes – Requirements Elicitation and Analysis – Requirements Validation.

UNIT – III **(10 Hours)**

System Modeling: Context Models – Structural Models .**Architectural Design :** Architectural Design Decisions – Architectural Views – Architectural Patterens – **Design and Implementation :** Design Patterns – Implementation Issues – Open Source Development .

UNIT - IV **(10 Hours)**

Software Testing : Development Testing : Unit Testing – Choosing Unit Testcases - Component Testing – System Testing . Test Driven Development - Release Testing – User Testing **. Software Evolution: Software Maintenance :** Maintenance Prediction – Software reengineering .**Legacy System Management .**

UNIT V **(10 Hours)**

Software Management : Project Management : Risk Management -Managing People – Team work . **Project Planning :** Plan Driven Development -Project Scheduling – Estimation Techniques : The COCOMO II Model.**Quality Management :** Software Quality – Software Standards.

TEXT BOOK :

1. *Ian Sommervilly*.2011. **Software Engineering** [Ninth Edition].Pearson Education,Inc.,Addison- Wesley.

REFERENCE BOOKS:

1. *Roger S.Pressman*. 2010. **Software Engineering: A Practitioner's Approach.** [Seventh Edition]. McGraw Hill, Newyork.
2. *Deepak Jain*. 2009. **Software Engineering: Principles and Practices**. [First edition]. Oxford university press.
3. *Waman S Jawadekar*. 2008. **Software Engineering: a Primer**. [First Edition]. Tata McGraw Hill, New Delhi.

15UCCCAA401	ALLIED IV: COST AND MANAGEMENT ACCOUNTING	SEMESTER - IV

Total Hours: 50

OBJECTIVES:

To enable the students to acquire:

1. Skills in respect of most sophisticated computerized accounting procedures and practices.
2. It helps the students to serve better the vast accounting needs of every commercial organization.

CONTENTS

UNIT - I **(10 Hours)**

Cost Accounting – Meaning, Scope, Objectives – Advantages and Limitations – Differences between Cost Accounting and Financial Accounting – Elements of cost – Preparation of cost sheet.

UNIT - II **(10 Hours)**

Material Management – Purchase Procedure – Various stock levels – Economic Order Quantity – Bin card and Stores ledger – Pricing of Issues – FIFO, LIFO – Simple Average and Weighted Average Methods

UNIT - III **(10 Hours)**

Management Accounting – Definition, Nature and scope, distinction between managerial accounting and financial accounting, distinction between managerial accounting and cost accounting

UNIT - IV **(10 Hours)**

Budgets and budgetary control – Meaning, objectives, advantages and limitations – preparation of Sales Budget, Production budget, Purchase budget, Cash budget, Flexible budget - Zero base budgeting-advantages and limitations

UNIT - V **(10 Hours)**

Application of marginal costing - Definition of marginal cost and costing - Features – Advantages and limitations - Marginal costing and absorption costing – Cost volume profit – Contribution - P/V ratio - Break even point – Margin of safety.

TEXT BOOK:

1. *Reddy, T.S and Hariprasad Reddy, Y.* 2015. **Cost and Management Accounting.** [Seventh Edition] Margham Publications, Chennai.

REFERENCE BOOKS:

1. *Maheshwari, S. N.* 2007. **Cost Accounting**. [Ninth Edition]. Sultan Chand & Sons, New Delhi.
2. *Sharma Sasi, K. Gupta*. 2008. **Management Accounting.** [Seventh Edition]. Kalyani Publications, Mumbai.

15UCAMP401/ 15UCSMP401	CORE PRACTICAL IV: RDBMS PACKAGE	SEMESTER – IV

LIST OF PRACTICALS:

1. SQL Queries for DDL Commands.
2. SQL Queries for DML Commands.
3. Creating a Table to implement Integrity Constraints and Referential Integrity Constraints in Column and Table Level.
4. SQL Queries for Built-in functions.
5. SQL Queries for creating an Index, Synonym, and Sequence.
6. SQL Queries for creating a User and assigning privileges and roles.
7. Program using PL/SQL for preparing Students Mark Statement.
8. Program for Looping Statements using PL/SQL.
9. Program using PL/SQL to prepare Employee Pay slip using Cursor.
10. Program using PL/SQL to implement Functions.
11. Program using PL/SQL to implement Procedures.
12. Program using PL/SQL to implement Triggers.

15UCCCAAP401	**ALLIED PRACTICAL II:** **ACCOUNTING PACKAGE II**	**SEMESTER -IV**

LIST OF PRACTICAL:

1. Creation of Inventory Masters – Stock Group, Simple unit of Measure, Stock Item
2. Feeding of Opening stock details
3. Display, Alteration and Deletion of Inventory masters
4. Preparation of Receipt note and Purchase invoice
5. Preparation of delivery note and Sales invoice
6. Preparation of Rejection out and Debit note
7. Preparation of Rejection in and Credit note
8. Preparation of Stock Journal
9. Creation of Cost centre and Cost categories and its allocation in voucher
10. Company operations set up for budget and Creation of Budget table
11. Preparation of budget variance statements
12. Generation of Cash Flow Statement and Funds Flow Statement

15UCASBC401/ 15UCSSBC401	SBC II: Technical Skills II (Java & Data Structures)	SEMESTER - IV

Total Hours: 15

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To analyze problems and its solutions.
2. Problem solving skills which required for placements in corporate.

CONTENTS

UNIT - I **(3 Hours)**

Java program Structure- Java Tokens- Java Statements – Constants, Variables and Data Types - Operators and Expressions -Decision Making and Looping

UNIT - II **(3 Hours)**

Classes, Objects and Methods Arrays, Strings - Inheritance

UNIT - III **(3 Hours)**

Life Cycle of Thread - Managing Errors and Exceptions - Managing Input/Output Files in Java

UNIT - IV **(3 Hours)**

Introduction to Data Structures-Arrays-Linked Lists - Stacks and Queues

UNIT - V **(3 Hours)**

Trees – Graphs - Sorting and Searching

REFERENCE BOOKS:

1. *Balagurusamy*, *E.* 2008**. Programming with Java – A Primer**. **[**Third Edition]. Tata McGraw Hill Education Pvt. Limited, New Delhi.
2. *John Hubbard, R.* 2004. **Programming With Java.** [Second Edition]. Tata McGraw Hill Education Pvt. Limited, New Delhi.
3. *Debasish Jana***.** 2005. **Java and Object-Oriented Programming Paradigm**. [Second Printing]. Prentice Hall of India, New Delhi.

4. *Yashavant P. Kanetkar. 2003.* **Data Structures Through C.** [Second Edition]. BPB Publications, NewDelhi.
5. *Seymour Lipschutz.* 2010. **Data Structures with C.** [First Edition]. McGraw Hill, International Editions, Schaum's Outline Series, New Delhi.
6. *G.A.V.Pai.* 2008. **Data Structures and Algorithms: Concepts, Techniques and Applications.** [First Edition]. McGraw Hill, International Editions, New Delhi.

15ULS401	CAREER COMPETENCY SKILLS II	SEMESTER – IV

Total Hours: 15

OBJECTIVE:

To enhance employability skills and to develop career competency

CONTENTS

UNIT – I **(3 Hours)**

A to Z Placement Terms-Assertiveness and Self Confidence-Career Opportunities-Skill set (Industry Expectations)

UNIT – II **(3 Hours)**

Principles of Communication (LSRW)-Describing Objects / Situations / People-Information Transfer - Picture Talk - News Paper and Book Review

UNIT – III **(3 Hours)**

Self Introduction - Situational Dialogues / Role Play (Telephonic Skills) - Oral Presentations- Prepared -'Just A Minute' Sessions (JAM)

UNIT – IV **(3 Hours)**

Dress code- Body Language- - Manners and Etiquettes -Resume Writing

UNIT – V **(3 Hours)**

Presentation Skills **–** Group Discussion-Interviewing Techniques- Mock Interview

15UCAM501/ 15UCSM501	CORE XI: PROGRAMMING IN .NET	SEMESTER - V

Total Hours : 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. The development of Web Applications using VB.NET and ASP.NET.
2. The enhancement of developing Database applications using ADO.NET

CONTENTS

UNIT - I **(10 Hours)**

The .NET Platform and the Web: The path way to Web Applications- The Web Client/Server Model: Web Clients and Web Servers – Protocols for Web Client/Server Communication – Server-Side Processing with CGI Programs – Disadvantages of Using CGI. Components of ASP.NET and the .NET Framework- Overview of Internet Information Server: ISAPI Extensions – ISAPI Filters. Overview of ASP.NET: Web Forms.The .NET Common Language Runtime and Class Library. Managed Components in .NET- Web Services- Language Independence in the .NET Framework- COM+ Component Services and .NET- Direction and Plans for .NET. **TheVB.NET Crash Course:** What is VB.NET? -Hello World (Yet Again): Your First VB Application. Variables, Constants and Operators: Variable Types – Declaring and Assigning Variables – Scope and Lifetime of Variables – Arrays – Converting Data Types – Using Constants – Arithmetic and Comparison Operators. Modularizing Your Code-Function and Subroutines: Using Functions – Using Subroutines. Controlling Program Flow: Conditional Processing – Flow Control Statements - Loops.

UNIT - II **(10 Hours)**

TheVB.NET Crash Course: Handling Errors and Exceptions: Unstructured Error Handling – Structured Exception Handling. Object Oriented Programming: Class Basics – ClassProperties – Constructors and Destructors – Inheritance-Overridden Functions – Overloading – Polymorphism Overview – Interfaces-Implementing Polymorphism by using Interfaces. Multithreaded Programming: Thread Synchronization – Events and Thread Synchronization.

UNIT - III **(10 Hours)**

Working with ASP.NET: The Features of ASP.NET- The Anatomy of ASP.NET pages: The code Structure of ASP.NET – Execution Stages and State Management – The Events Model for the Page Class. Introducing Web Forms-VS.NET Web Applications and Other IDE Basics- Separating Content and Code–the Code-Behind Feature- Application Configuration: Structure and Configuration of the Global.asax File. Using HTML Controls: The HTMLForm Control– The HTMLAnchor Control – The HTMLButton Control – The HTMLGenericControl Control –The HTMLImage Control– The HTMLInputButton Control– The HTMLInputCheckBox Control–The HTMLInputFile Control– The HTMLInputHidden Control– The HTMLInputImage Control–The HTMLInputRadioButtonControl– The HTMLInputTextControl– The HTMLSelect Control– The HTMLTable, HTMLTableCell, and HTMLTableRow Controls– The HTML TextArea Control. Using Web Controls: Shared Web Control Properties.Web Controls for Displaying and Formatting Data: The Label Control – The Panel Control– The Table, TableRow, and TableCell Controls. Web Controls for Creating Buttons: The Button Control– The ImageButton Control – The LinkButton Control – Demonstration of Web Button Controls. Web Control for Inputting Text: The TextBox Control. Web Controls for selecting Choices: The CheckBox Control– The RadioButton Control–The CheckBoxList and RadioButtonList Controls. Web Controls for Creating Lists: The ListBox Control – The DropDownList Control.

UNIT - IV **(11 Hours)**

Working with ASP.NET: Miscellaneous Basic Controls: The Hyper Link Control-The Image Control. Creating a Simple ASP.NET Application: YourFirst ASP.NET Project. ASP.NET Page Directives: The @ Page and @ Control Directives – The @ Import Directive – The @ Register Directive – The @ Assembly Directive – The @ OutputCache Directive. ASP.NET Rich Controls: The Calendar Control – AdRotator Control.Validation Controls: The BaseValidator Control – The RequiredFieldValidator Control – The CompareValidator Control – The RangeValidator Control – The RegularExpressionValidator Control – CustomValidator Control. Data List Controls: The Repeater Control-The DataGrid Control-The DataList Control.

UNIT - V **(9 Hours)**

Accessing Data with ADO.NET: Overview of Data Access on the Web: Flat Files – Legacy or Mainframe Data – Proprietary Database APIs – Standard APIs – ADO. ADO.NET: The Next Generation of Data Access Technology-ADO.NET Programming Objects and Architecture: The DataSet Class – The .NET Managed Data Provider. Displaying Database Data: The IDataReader Interface (System.Data.IDataReader) – Working with Command Parameters – The DataGrid Control Revisited – Displaying Data in the DataGrid Control – Editing Data in the

DataGrid Control. Programming with the DataList and DataGrid Controls: An Online Photo Gallery. Working with the Dataset and DataTable Objects: The DataSet Class Summary – The DataTable Class Summary – Creating DataSet and DataTable Objects – Adding Data to a DataTable Object – Displaying Data in a DataTable Object – Loading and Updating DataSet Objects with the IDataAdapter Interface – Filtering and Sorting Data with the DataView Class.

TEXT BOOK*:*

1. *Matt Crouch, J.* 2006. **ASP.NET and VB.NET Web Programming.** [First Impression 2006]. Pearson Education, India.

REFERENCE BOOKS:

1. *Damien Foggon and Daniel Maharry.* 2005. **Beginning ASP.NET 1.1 Databases: From Novice to Professional.** [First Indian Reprint]. Apress, USA.
2. *Dave Mercer.* 2002. **ASP .NET: A Beginner's Guide.** [First Edition]. Tata McGraw-Hill Publication, New Delhi.
3. *Jeffrey R. Shapiro.* 2002. **The Complete Reference Visual Basic .NET.** [Tata McGraw Hill Edition]. Tata McGraw Hill, New Delhi.
4. *Steven Holzner*. 2008. **Visual Basic .NET Programming BLACK BOOK**. [New Edition]. Dreamtech Press, New Delhi.

15UCAM502	CORE XII: MOBILE COMMUNICATIONS	SEMESTER - V

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Wireless transmission
2. Mobile communication

UNIT - I **(10 Hours)**

Introduction: Applications - A Simplified Reference Model. **Wireless Transmission:** Cellular Systems. **Medium Access Control:** Motivation for a Specialized MAC . Hidden and exposed terminals - Near and far terminals - SDMA - FDMA – **TDMA:** Fixed TDM -Classical Aloha- Slotted Aloha -Carrier Sense Multiple Access - Demand assigned Multiple Access - PRMA Packet Reservation Multiple Access - Reservation TDMA - Multiple Access With Collision Avoidance - Polling - Inhibit Sense Multiple Access. **CDMA:** Spread Aloha multiple access- Comparison of S/T/F/CDMA.

UNIT-II **(10 Hours)**

Telecommunications Systems: GSM: Mobile Services - System Architecture - Radio Interface-Protocols - Localization And Calling-Handover-Security-NewDataServices **DECT:** System Architecture - Protocol Architecture – **TETRA.**

Unit – III **(10 Hours)**

Satellite systems: History – Applications – Basics. **Wireless LAN:** Infra Red Vs Radio Transmission - Infrastructure and Ad-Hoc Network. **IEEE 802.11** : System Architecture - Protocol Architecture - Physical Layer - Medium Access Control Layer - MAC Management. **Bluetooth :** User scenarios - Architecture - Radio layer - Base band layer -Link manager protocol – L2CAP – Security.

UNIT-IV **(10 Hours)**

Mobile Network Layer: Mobile IP - Dynamic Host Configuration Protocol - Mobile Ad-Hoc Networks. **Mobile Transport Layer:** Traditional TCP-Classical TCP Improvement-TCP Over 2.5/3G Wireless Networks.

UNIT-V **(10 Hours)**

Support for Mobility: Wireless Application Protocol (Version1.0): Architecture – Wireless Datagram Protocol-Wireless Transport Layer Security- Wireless Transaction Protocol –Wireless Session Protocol- Wireless Application Environment-Wireless Markup Language - WML Script. **WAP 2.0**.

TEXT BOOK*:*

1. *Jochen H.Schiller.* 2007. Mobile Communications**.** [Fifth Impression 2007]. Pearson Education, India.

REFERENCE BOOK:

1. *Asoke Talukder, K. and Roopa Yavagal, R.* 2009. **Mobile Computing – Technology, Applications and Service Creation**. [Eleventh Reprint]. TataMcGraw Hill, New Delhi.

15UCAM503/ 15UCSM503	CORE XIII: COMPUTER NETWORKS	SEMESTER - V

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Working principles of Network layers.
2. Security and its algorithms.

CONTENTS

UNIT I **(10 Hours)**

I**ntroduction** – Uses of Computer Networks – Network Hardware – Network Software - Reference models: The OSI Reference Model – TCP/IP Reference Model.

UNIT II **(10 Hours)**

The Physical Layer: Guided Transmission Media – Wireless Transmission – Communication Satellites – Digital Modulation and Multiplexing – The Public Switched Telephone Network: Structure of the Telephone System – Switching.

UNIT III **(10 Hours)**

The Data link Layer: Data link layer Design Issues – Error Detection and Correction. **The Network Layer:** The Network Layer Design Issues – Routing Algorithms - Congestion Control Algorithms.

UNIT IV **(10 Hours)**

The Transport Layer: Elements of Transport Protocols – Congestion Control – The Internet Transport Protocols: UDP – The Internet Transport Protocols: TCP.

UNIT V **(10 Hours)**

The Application Layer: DNS: The Domain Name System – Electronic mail – **Network Security:** Cryptography **-** Symmetric Key Algorithms – Public Key Algorithms –Communication Security – E- mail Security – Web Security.

TEXT BOOK:

1. *Andrew S. Tanenbaum.* 2011. **Computer Networks.** [Fifth Edition].Pearson Prentice Hall.

REFERENCE BOOKS:

1. *Behrouz A. Forouzan*. 2003. **Data Communications and Networking.** [Second Edition]. Tata McGraw-Hill.

2. *William Stallings,* 2011. **Data and Computer Communication**. [Eighth Edition]. PHI.

15UCAEL501/ 15UCSEL501	ELECTIVE I: E-COMMERCE	SEMESTER – V

OBJECTIVES:

The subject aims to build the concepts regarding:

1. How to do business through the Web in a securable manner.
2. E-Marketing, E-Payment, Mobile Commerce and Legal Issues.

CONTENTS

UNIT - I

History of E-commerce and Indian Business Context: Early Business Information Interchange Efforts-Emergence of the Internet – Emergence of World Wide Web – The Milestones – Advantages of E-commerce - Disadvantages of E-commerce – Transition to E-commerce in India – The Internet and India – E-Transition Challenges for Indian Corporates-The Information Technology Act,2000. **Business Models for E-Commerce:** E-business model based on the relationship of Transaction parties.

UNIT - II

Enabling Technologies of the World Wide Web: Internet Client- Server Applications - Software Agents – Internet Standards and Specifications – Internet Service Provider (ISP). **E-Marketing:** Traditional Marketing - Identifying Web Presence Goals – The Browsing Behaviour Model – Online Marketing – E-advertising.

UNIT - III

E-Security: Information System Security – Security on the Internet – E-business Risk Management Issues-Information security environment in India. **E-Payment Systems:** Digital Token-based E-Payment Systems - Classification of New Payment Systems– Properties of Electronic Cash (E-cash) –Risk and E-payment System.

UNIT - IV

E-Strategy : Information and Strategy – The Virtual value Chain – Seven Dimensions of E-commerce Strategy – Value Chain and E-strategy – Planning the E-commerce project - E-commerce Strategy and Knowledge Management - E-Business Strategy and Data Warehousing and Data Mining. **Information Systems for Mobile**

Commerce: What is Mobile Commerce – Wireless Applications - Cellular Network – Wireless Spectrum - Technologies for Mobile Commerce - WAP Programming Model – Wireless Technologies.

UNIT - V

Customer – Effective Web Design: Requirements of Intelligent Websites**-** Setting Websites Goals and Objectives – Strategies for Website Development. **Legal and Ethical Issues**: Ethical Issues in the digital Economy - Computers as Targets for Crime - Computers as Storage Devices - Computers as Communication Tools - Cyberstalking – Privacy is at Risk in the Internet Age – Phishing – Copyright – Internet Gambling – Threats to Children- The Special Nature of Computer Ethics.

TEXT BOOK:

1. *Joseph, P.T. S.J.* 2009**. E-Commerce An Indian Perspective.** [Third Edition]. Prentice-Hall of India, New Delhi.

REFFERENCE BOOKS:

1. *Gray Schneider*, *P.* 2007. **Electronic Commerce** [Seventh Annual Edition]**.** Thomson Course/technology.
2. *Ravi Kalakota and Andrew Whinston, B.* 2000. **Frontiers of Electronic Commerce**. [Fifth Indian Reprint]. Pearson Education, New Delhi.
3. *Ravi Kalakot and Andrew Whinston, B.* 2000. **Electronic Commerce –A manager's Guide.** [Second Indian Reprint]. Pearson Education, New Delhi.

15UCAEL502/ 15UCSEL502	ELECTIVE I: INTERNET AND WEB SERVICES	SEMESTER – V

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Applications associated with the Internet.
2. Web Services/Blog Services/Social Network.
3. Earning Money on the Internet.

UNIT I

Introduction to the Internet: Introduction – Some Statistics – What is Internet – How does Internet Works? – What is special about the Internet? – A Brief history of Internet. **How Internet Works:** Introduction - **Getting Connected:** Introduction – Dial up connection – Dedicated Lines – ISDN – DSL – Cable Modem – Satellite Internet – Cellular broadband – Wireless broadband – Wired and Wireless broadband Internet access – choosing the best Internet connection. **World Wide Web (WWW):** Introduction – Internet and Web – How the Web works? – A brief history of WWW.

UNIT II

Web Browsers and Web Browsing: Web browsers – Types of Browsers - Web Browsing **Searching the Web:** Introduction – Information sources - Finding Information on the Internet – Searching the web - Tips for Internet Research. **Anonymity, Safety and Privacy:** Introduction – Privacy – Cookies – Anonymity – Encryption – Understanding security and privacy.

UNIT – III

Internet Addressing: Introduction – IP Address Domain Names –Domain Name System – Uniform Resource Locator (URL) – Electronic Mail Addresses. **Internet Protocols:** Introduction – Hyper Text Transfer Protocol (HTTP) – Telnet – Gopher – Wide Area Information Service (WAIS) – **E-Mail:** E-Mail Ethics – E – Mail Advantages and Disadvantages – Tips for effective E-Mail use – E-Mail safety tips – Smileys. **Websites and WebPages:** Introduction – Web design – Creating a website – Web hosting – Website Promotion. **Overview of Web Technologies:** Introduction – HTML – XHTML - XML – Cascading Style Sheets (CSS) – Use of CSS – JavaScript – PHP – Databases on the Web.

UNIT – IV

Blogging: Introduction – What is Blog? – Why Blog? – History of Blogs – State of the Blogosphere – Why is blogging so popular? – Blog search engines and Communities

– Authors, Books and Blogs – Blogs and Employment – Pitfalls to avoid while Blogging – Is Blogging Good or Bad? **Electronic Publishing:** Introduction – Electronic Publishing (E – Publishing) – E – book readers – Economics of E–publishing – Applications of E – publishing – E–publishing-Advantages and Disadvantages. **Social Networking:** Introduction – Social Networking Timeline – Why Social Networking? – Dangers of social Networking – Getting Connected – Finally.

UNIT – V

Newsgroups, Mailing Lists and Discussion Forums: News Groups – Newsgroup Organization - Mailing Lists - Discussion Forums –Discussion on the Internet. **Chat, Instant Messaging (IM), Internet Telephony (VoIP) and Videoconferencing :** Internet Chat – Instant Messaging – Internet Telephony - Video Conferencing. **Making Money on the Internet:** Introduction – Writing – Product Reviews – Sharing your knowledge – Advertising – Affiliate Programs – Selling – On-line Tutoring.

TEXT BOOK:

1. *Alexis Leon and Mathews Leon.* 2012. **Internet for Everyone. [15th Anniversary Edition] V**ikas Publishing House Private Limited, Noida.

REFERENCE BOOKS:

1. Dougulas E. Comer. 2009, **The Internet Book,** Fourth Edition PHI learning private limited, Newdelhi.

2. ISRD Group. 2011. **Internet Technology and Web Design**, Tata McGraw Hill, New Delhi.

15UCAEL503/ 15UCSEL503	ELECTIVE I: SOFTWARE PROJECT MANAGEMENT	SEMESTER – V

OBJECTIVES:

The subject aims to build the concepts regarding:

1. The Importance of Project Management in an Industry.
2. Various Approaches of Project Management and Estimation Techniques.
3. Human Resource Management in Project Management.

CONTENTS

UNIT - I

Introduction to Software Project Management: Introduction – Why is software project management important? – What is a project?-Software projects versus other types of project –Contract management and technical project management – Activities covered by software project management – Plans, methods and methodologies – Some ways of categorizing software projects - Stakeholders-Setting Objectives- The Business Case – Project Success and Failure - What is management? – Management Control. **Project Evaluation and Programme Management:** Introduction - A Business Case – Project Portfolio Management-Evaluation of Individual Projects -Cost-benefit Evaluation Techniques- Risk Evaluation- Programme Management – Managing the Allocation of Resources within Programmes -Strategic Programme Management – Creating a Programme – Aids to Programme Management - Benefits Management. **An Overview of Project Planning:** Step 0 to Step 10.

UNIT - II

Selection of an appropriate Project approach: Introduction-Build Or Buy?-Choosing Methodologies and Technologies – Software Processes and Process Models- Choice of process models- Structure versus Speed of Delivery-The Waterfall Model-The Spiral Model-Software Prototyping- Other ways of Categorizing Prototypes – Incremental Delivery – Atern /Dynamic Systems Development method- Rapid Application Development – Agile Methods – Extreme Programming(XP)- Scrum – Managing Iterative Process. **Software Effort Estimation:** Introduction- Where are Estimates done? -The Basis for Software Estimating-Software Effort Estimation techniques – Bottom – Up Estimating – The Top – Down approach and Parametric Models- Expert Judgment- -Estimating by Analogy-Albrecht Function Point Analysis-Function Points Mark II-COSMIC full Function Points –COCOMO II: A Parametric Productivity Model.

UNIT - III

Activity planning: Introduction- The Objectives of Activity Planning -When to Plan-Project Schedules-Projects and Activities-Sequencing and Scheduling Activities-Network Planning Models - Formulating a Network Model-Adding the time Dimension-The Forward Pass-The Backward Pass-Identifying the Critical Path-Activity Float-Shortening the Project Duration-Identifying Critical Activities-Activity-on-Arrow Networks.

UNIT - IV

Risk management: Introduction- Risk-Categories of Risk-A Framework for Dealing with Risk-Risk Identification-Risk Assessment - Risk Planning - Risk Management-Evaluating Risks to the Schedule - Applying the PERT Techniques- Monte Carlo Simulations. **Resource Allocation:** Introduction-The Nature of Resources - Identifying Resource Requirements-Scheduling Resources - Creating Critical Paths-Counting the Cost-Being Specific - Publishing the Resource Schedule- Cost Schedules- The Scheduling Sequence.

UNIT - V

Monitoring and Control: Introduction-Creating the Framework - Collecting the Data-Review – Project Termination Review -Visualizing Progress - Cost Monitoring-Earned Value Analysis-Prioritizing Monitoring - Getting the Project Back to Target - Change Control**-** Software Configuration Management**. Managing Contracts:** Introduction-Types of Contract- Stages in Contract Placement-Typical Terms of a Contract- Contract Management-Acceptance. **Managing People in Software Environments:** Introduction- Understanding Behavior **– Organizational Behavior:** A Background-Selecting the Right Person for the Job- Instruction in the Best Methods –Motivation – The Oldham-Hackman Job Characteristics Model-Stress – Health and Safety – Some Ethical and Professional Concerns .

TEXT BOOK:

1. Bob Hughes, Mike Cotterell, Rajib Mall. 2012. **Software Project Management**. [Fifth Edition]. Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

1. G.P.Sudhakar.2010**.Elements of Software Project Management.** PHI Learning Private Limited. New Delhi.

2. *Kieron Conway*. 2004. **Software Project Management from concept to deployment** [First Edition, Third Reprint] . Dreamtech Press, New Delhi.

3. *Walker Royce.* 2006. **Software Project Management A Unified Framework.** [Second Impression]. Pearson Education, India.

15UCAMP501/ 15UCSMP501	CORE PRACTICAL V: PROGRAMMING IN .NET	SEMESTER - V

LIST OF PRACTICAL:

1. Designing a Simple Calculator using VB.NET.
2. Simulating a Text Editor using VB.NET.
3. Developing a Timer Based Quiz using VB.NET.
4. Writing a program for handling at least four exceptions using VB.NET.
5. Writing a program for implementing the overloading concept using VB.NET.
6. Writing a program for loading different advertisements in a web page using ADRotator in ASP.NET.
7. Performing the following validations in a Web Page using ASP. NET
   a. Compare Validator
   b. Custom Validator
   c. Range Validator
8. Performing the following validations in a Web Page using ASP. NET
   a. Regular Expression Validator
   b. Required Field Validator
   c. Validation summary
9. Writing a SQL query to fetch the data from two tables and display it in the Data grid.
10. Establishing Database connection for binding Student Database through Repeater control using ASP.NET.
11. Developing an Application for Banking using VB.NET.
12. Developing an Application for Online Shopping using ASP.NET.

15UCASBCP501/ 15UCSSBCP501	SBC III: SOFTWARE TESTING TOOLS	SEMESTER - V

Theory Part (Not for Written Examination)

Software Testing - Strategies: Conventional - Object Oriented - Validation Testing - Criteria - Alpha - Beta Testing- System Testing - Recovery - Security - Stress - Performance - Testing Tactics - Testing Fundamentals-Black Box - White Box - Basis Path-Control Structure.

Win Runner: Overview of Win Runner-Testing an Application using WinRunner-Test Script Language (TSL)-GUI MAP File-Synchronization of Test Cases-Data Driven Testing-Rapid Test Script Wizard-Mapping Custom Object to a Standard Class-Checking GUI Objects. **LoadRunner**: Overview of Load Runner-Creating Vuser script using Virtual User Generator-Creating Virtual Users using Load runner Controller.

TEXT BOOK:

1. *Roger S.Pressman*. 2010. **Software Engineering: A Practitioner's Approach.** [Seventh Edition]. McGraw Hill, Newyork.

2. K.V.K.K Prasad.2012**.Software Testing Tools Covering Win Runner, Load Runner, JMeter, Test Director and QTP with case Studies** [First Indian Edition] BPB Publications, New Delhi.

LIST OF APPLICATIONS (Using VB 6.0)

1. Simple Calculator Application.
2. Employee Information System.
3. Students Information System.
4. Quiz
5. Banking System
6. Railway reservation System
7. Library Information System
8. Application for Purchase and Sales order system
9. Customer profile for Insurance Company using Data Control.
10. Income Tax Application.

Note:

Test all the above applications using software testing tools such as Win Runner, Silk Test, Load Runner, Test Director.

15UCAM601/ 15UCSM601	CORE XIV: COMPUTER GRAPHICS	SEMESTER - VI

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. The graphic techniques and algorithms.
2. The multimedia system design, Compression & decompression techniques and various I/O Technologies.

CONTENTS

UNIT I **(10 Hours)**

A Survey of Computer Graphics: Computer–Aided Design- Presentation Graphics- Computer Art – Entertainment - Education and Training - Visualization - Image Processing - Graphical User Interfaces. **Overview of Graphics Systems:** Video Display Devices – Raster Scan Systems - Video Controller – Random Scan Systems - Graphics Monitors and Workstations - Input Devices and Hard Copy Devices.

UNIT II **(11 Hours)**

Output Primitives: Points and Lines - Line Drawing Algorithms: DDA Algorithm - Bresenham's Line Algorithm – Circle Generating Algorithms. **Two Dimensional Geometric Transformations:** Basic Transformations - Matrix Representations and Homogeneous Coordinates - Composite Transformations - Other Transformations. **Two Dimensional Viewing:** The Viewing Pipeline - Clipping Operations - Point Clipping - Line Clipping: Cohen-Sutherland line clipping- Polygon Clipping: Sutherland-Hodgeman Polygon Clipping - Curve Clipping - Text Clipping - Exterior Clipping.

UNIT III **(09 Hours)**

Structures and Hierarchical Modeling: Structure Concepts - Editing Structures – Basic Modeling Concepts – Hierarchical Modeling with Structures. Graphical **User Interfaces and Interactive Input Methods:** The User Dialogue: Windows and Icons - Input of Graphical Data - Input Functions - Interactive Picture Construction Techniques – Virtual Reality Environments.

UNIT IV **(10 Hours)**

Three-Dimensional Concepts: Three-Dimensional Display Methods - Three-Dimensional Graphics Packages. **Three-Dimensional Object Representations:** Polygon Surfaces - Curved Lines and Surfaces - Quadric Surfaces - Blobby Objects. **Three-Dimensional Viewing:** Projections – Clipping – Hardware Implementations - Three-Dimensional Viewing Functions.

UNIT V **(10 Hours)**

Visible-Surface Detection Methods: Classification of Visible-Surface Detection Algorithms - Back-Face Detection - Depth-Buffer Method - A-Buffer Method - Scan-Line Method - Depth-Sorting Method - Area-Subdivision Method. **Color Models and Color Applications:** Standard Primaries and the chromaticity Diagram: XYZ Color Model - RGB Color Model - YIQ Color Model - CMY Color Model - HSV Color Model. **Computer Animation:** Design of Animation Sequences - General Computer-Animation Functions - Raster Animations - Computer-Animation Languages - Key-Frame Systems - Motion Specifications.

TEXT BOOK:

1. *Donald Hearn and Pauline Baker.M*. 2008. **Computer Graphics C Version**. [Second Edition-Sixth Impression]. Pearson Education in South Asia.

REFERENCE BOOKS:

1. Neuman.W.M. and Sproull R.F. 1997. **Principles of Interactive Computer Graphics.** [Second Edition]. McGraw Hill.
2. Pradeep K. Bhatia. 2008. **Computer Graphics**. [First Edition]. I.K.International Publishing House Pvt Ltd.
3. Zhigang Xiang and Roy A.Plastock. 1986. **Computer Graphics**. [Second Edition]. McGraw Hill.

15UCAM602/ 15UCSM602	CORE XV: OPEN SOURCE TECHNOLOGY	SEMESTER - VI

Total Hours : 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Understand the concept and evolution of FOSS.
2. The development of Web Applications using PHP.
3. The enhancement of developing Database applications with MySQL.

CONTENTS

UNIT – I **(10 Hours)**

Open Source Software: Introduction: The concept of software freedom – Definition - Related terms. Motivations - The consequences of the freedom of software - For the end user - For the public administration - For the developer - For the integrator - For service and maintenance providers - Summary. **A bit of history:** Free software before free software - And in the beginning it was free - The 70s and early 80s - The early development of Unix - The beginning: BSD, GNU, Richard Stallman, GNU - FSF: the free software movement is born - Berkeley's CSRG - The beginnings of the Internet - Other projects - Everything in its way - The quest for a kernel - The *BSD family - GNU/Linux comes onstage - A time of maturation - End of the nineties - Decade of 2000 - The future: an obstacle course?. **Legal aspects:** Brief introduction to intellectual property - Copyright - Trade secret - Patents and utility models - Registered trademarks and logos - Free software licences - Types of licences - Permissive licences - Strong licences - Distribution under several licences - Program documentation. **Developers and their motivations:** Introduction - Who are developers? - What do developers do? - Geographical distribution - Dedication - Motivations - Leadership.

UNIT – II **(10 Hours)**

XHTML & CSS:Introduction to XHTML: Origins and Evolution of HTML and XHTML - Basic Syntax - Standard XHTML Document Structure - Basic Text Markup - Images - Hypertext Links - Lists - Tables - Forms - Syntactic Differences between HTMLandXHTML

Cascading Style Sheets: Introduction - Levels of Style Sheets - Style Specification Formats - Selector Forms - Property Value Forms - Font Properties - List Properties -

Color - Alignment of Text - The Box Model - Background Images - The and Tags - Conflict Resolution.

UNIT – III **(8 Hours)**

All About The L.A.M.P. Framework:

Introduction to Linux - Introduction to Apache - Introduction to MySQL and Introduction to PHP - How the L.A.M.P. framework works.

UNIT - IV: **(11 Hours)**

Understanding The MySQL Database Db Storage Engines - Db Administration - SQL Elements - Table Creation - Working With Table Data - Tables And Its Structure - Operators And Regular Expression - Grouping Data - Joins - Views - Functions - Data Constraints - Subquery - Union - Indexes.

UNIT - V: **(11 Hours)**

Understanding the PHP Language

Mixing PHP and HTML - Variables and Operators - Control Structures - Functions - Regular Expressions - Working With Database using MySQL - Cookies – Sessions.

TEXT BOOKS:

1. *Jesús M. González-Barahona et al*, 2009 **Introduction to Free Software**. [Third Edition]. Free Technology Academy, Europe.
2. *Robert W.Sebesta*, 2008. **Programming the World Wide Web.**[Sixth Edition]. Pearson, India.
3. *Sharnam Shah, Vaishali Shah*, 2009. **LAMP Programming for Professionals.**[First Edition].Shroff Publishers and Distributors Pvt. Ltd., Mumbai.

REFERENCE BOOKS:

1. *Wendy Willard*. 2001.**HTML: A Beginner's Guide**. [First Edition]. Tata McGraw Hill, Newyork.

2. *John A Phillips and Michele E Davis*. 2007. **Learning PHP AND MYSQL**. [Second edition]. Shroff Publishers and Distributors (SPD), New Delhi.
3. *Lynn Beighley and Michael Morrison*. 2008. **Head First PHP AND MYSQL**. [First Edition]. Shroff Publishers and Distributors (SPD), New Delhi.
4. *Joyce Park and Tim Converse*. 2004. **PHP5 AND MYSQL BIBLE**. [First Edition]. Wiley-India.

15UCAEL601/ 15UCSEL601	ELECTIVE II: PRINCIPLES OF INFORMATION SECURITY	SEMESTER - VI

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. The importance of Information Security.
2. Legal and ethical issues of Information Security
3. Various Security Technologies to protect Information against threats
4. Systematic Project Management to ensure Security in an Organization

UNIT I **(10 Hours)**

Information Security: An Introduction: Introduction – The History of Information Security – What is Security? – Components of an Information System – The System Development Life Cycle- The Security System Development Life Cycle. **Why Security is needed ? :** Introduction - Business needs first – Threats – Attacks – Secure Software Development.

UNIT II **(10 Hours)**

Professional, Legal, and Ethical issues in Information Security: Introduction – Law and Ethics in Information Security- Relevant U.S. Laws – International laws and legal bodies – Ethics and Information Security – Codes of Ethics and Professional Organizations. **Managing IT Risk:** Introduction – An Overview of Risk Management – Risk Identification – Risk Assessment – Risk Control Strategies.

UNIT – III **(10 Hours)**

How to Plan for Security: Introduction **-** Information Security Planning and Governance - Information Security Policy, Standards, and Practices – The Information Security Blueprint – Security Education, Training , and Awareness Program. **Security Technology : Wireless VPNs, and Firewalls :** Introduction – Access Control – Firewalls – Protecting Remote Connections.

UNIT – IV **(10 Hours)**

Security Technology: Prevention Systems , Intrusion Detection , and Other Security Tools : Introduction – Intrusion Detection and Prevention systems – Honeypots, Honeynets, and Padded cell systems – Scanning and Analysis Tools – Biometric Access Control. **Using Encryption :** Attacks on Crypto Systems.

UNIT – V **(10 Hours)**

Implementing Information Security : Introduction – Information Security Project Management – Technical Aspects of Implementation – Nontechnical Aspects of Implementation - Information Systems Security Certification and Accreditation. **Maintenance of Information Security and eDiscovery :** Introduction – Digital Forensics.

TEXT BOOK:

1. *Michael E.Whitman and Herbert J.Mattord .* 2014. **Principles of Information Security. [Seventh Impression]** Cengage Learning India Private Limited, Delhi.

REFERENCE BOOKS:

1. *Calabrese.* 2006. **Information Security Intelligence: Cryptographic Principles and Applications.** [India Edition]. Thomson Delmar Learning Publications.

2. *Bhaskar, S.M. and Ahson. S.I.* 2008. **Information Security – A Practical Approach**. Narosa Publishing House, New Delhi.

15UCAEL602/ 15UCSEL602	ELECTIVE II: CLOUD COMPUTING	SEMESTER - VI

Total Hours: 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Emerging areas of Cloud Computing.
2. Virtualization, Cloud Security and Services.

CONTENTS

UNIT - I (10Hours)

Understanding Cloud Computing: Beyond the Desktop: An Introduction to Cloud Computing: Cloud Computing: What It Is – and What It Isn't – From Collaboration to the Cloud: A Short History of Cloud Computing – The Network Is the Computer: How Cloud Computing Works – Companies in the Cloud: Cloud Computing Today – Why Cloud Computing Matters. **Are You Ready for Computing in the Cloud? :** The Pros and Cons of Cloud Computing – Who Benefits from Cloud Computing? – Who Shouldn't Be Using Cloud Computing? **Developing Cloud Services:** Why Develop Web-based Applications? – The Pros and Cons of Cloud Service Development– Types of Cloud Service Development – Discovering Cloud Services Development Services and Tools.

UNIT II (10 Hours)

Cloud Computing for Everyone: Cloud Computing for the Family: Centralized E-Mail Communications – Collaborating on Schedules – Collaborating on Grocery List –Collaborating on To-Do List – Collaborating on Household Budgets – Collaborating on contact list. **Cloud Computing for the Community:** Communicating across the Community – Collaborating on Group Projects and Events. **Cloud Computing for the Corporation:** Managing Schedules – Managing Contact List – Managing Projects – Collaborating on Reports – Collaborating on Marketing Materials – Collaborating on Expense Reports – Collaborating on Budgets – Collaborating on Financial Statements – Collaborating on Presentations. **Using Cloud Services: Collaborating on Calendars, Schedules, and Task Management:** Exploring Online Calendar Applications – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management.

UNIT III (10 Hours)

Using Platforms: Understanding Abstraction and Virtualization: Using Virtualization Technologies – Load Balancing and Virtualization – Understanding Hypervisors – Understanding Machine Imaging – Porting Applications. **Using**

Google Web Services : Exploring Google Applications – Exploring the Google Toolkit. **Using Amazon Web Services:** Understanding Amazon Web Services – Amazon Web Service Components and Services. **Using Microsoft Cloud Services:** Exploring Microsoft Cloud Services –Using Windows Live.

UNIT IV **(10 Hours)**

Exploring Cloud Infrastructures: Managing the Cloud: Administrating the Cloud. **Understanding Cloud Security:** Securing the Cloud – Securing Data – Establishing Identity and Presence. **Understanding Services and Applications:** Moving **Applications to the Cloud:** Applications in the Cloud.

UNIT – V **(10 Hours)**

Understanding Services and Applications: Using Media and Streaming: Understanding the Streaming Process – Audio Streaming – Working with VoIP Applications – Video Streaming. **Using the Mobile cloud: Working with Mobile Devices**: Using Smart Phones with the Cloud. **Working with Mobile Web Services:** Understanding Service Types.

TEXT BOOKS:

1. *Michael Miller*. 2009. **Cloud Computing: Web – Based Applications That Change the Way You Work and Collaborate Online.** [First Impression]. Pearson Education. New Delhi. (Unit I and Unit II)
2. *Barrie Sosinsky*. 2013. **Cloud Computing Bible**. [First Edition - Reprint]. Wiley India Edition. New Delhi. (Unit III to Unit V)

REFERENCE BOOKS:

1. *George Reese. 2009.* **Cloud Application Architectures: Building Applications and Infrastructure in the Cloud**. [First Edition]. Oreily's Publications. New York.
2. *Thomas Erl, Ricardo Puttini, Zaigham Mahmood.* 2013. **Cloud Computing: Concepts, Technology & Architecture**. [Second Edition]. Prentice Hall. New York.
3. *Kris Jamsa.* 2014. **Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More**. [First Edition]. Jones and Bartlett Learning. New Delhi.

15UCAEL603/ 15UCSEL603	ELECTIVE II: DATA MINING	SEMESTER – VI

Total Hours : 50

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamental and Research aspects of Data Mining.
2. Implementation of Mining Algorithms on various Applications.

CONTENTS

UNIT - I **(12 Hours)**

Introduction: Motivation –Data Warehousing and Data Mining Technologies-Data Models-Data Warehousing and OLAP: User's Perspective –Data Mining: User's Perspective-Related Disciplines. **Frequent Pattern Mining**: Basic Problem Definition-Mining Association Rules-Applications-Variations-Interestingness-Frequent Item set Mining (FIM) Algorithms.

UNIT - II **(9 Hours)**

Classification: Basic Problem Definition -Applications-Evaluation of classifiers-Other issues-Classification Techniques-Optimal Classification Algorithms.

UNIT - III **(10 Hours)**

Clustering: Basic Problem Definition- Clustering Applications- Measurement of Similarity-Evaluation of Clustering Algorithms- Classification of Clustering Algorithms-Partitioning Methods-Hierarchical Methods-Density based Methods-Grid-Based methods.

UNIT - IV **(7 Hours)**

Pattern Discovery in Real-World Data: Relational Data- Transactional Data-Multi-Dimensional Data-Distributed Data-Spatial Data-Data Streams-Time-Series Data-Text and Web Data.

UNIT - V **(12 Hours)**

Data Warehousing: The Data Model: Fundamentals-Data Warehouse Data Characteristics-Data Warehouse Components-Approaches to Build Data Marts and Data Warehouse-ETL-Logical Data Modeling-More on Dimensional Modeling-OLAP.

TEXT BOOK:

1. *Vikram Pudi and Radha Krishna, P.* 2010**. Data Mining.** [Third Impression]. Oxford University Press, New Delhi.

REFERENCE BOOKS:

1. *Jiawei Han and Micheline Kamber***.** 2006. **Data Mining Concepts and Techniques.** [Second edition]. Morgan Kaufmann Publishers an Imprint of Elsevier, New Delhi.
2. *Arun, K. Pujari.* 2007. **Data Mining Techniques.** [Eleventh Impression]. Universities Press Private Limited, Hyderabad.
3. *Soman, K. P, Shyam Diwaka, and Ajay, V.* 2006. **Insight into Data Mining: Theory and Practice.** [Second Printing].Prentice-Hall of India Private Limited, New Delhi.

15UCAMP601/ 15UCSMP601	CORE PRACTICAL VI: OPEN SOURCE TECHNOLOGY	SEMESTER - VI

LIST OF PRACTICAL:

HTML

1. Creating a Webpage to display the text with Headings, Paragraphs, Ordered List and Unordered List items.
2. Creating a Table with the Style as below:

PRODUCT/AREA	AREA1	AREA2	AREA3
PIV Processor	100	102	58
Monitor	78	98	120
Mouse	69	78	75
Keyboard	98	75	85

3. Creating a Webpage with Frame and Hyperlinks.

MySQL

4. Creating a Database 'Marks', Create two tables namely 'BSc ' and 'BCA' to enter students mark.

PHP

5. Program for Functions.
6. Program using Control statements and Looping statements.
7. Program to Pass Value from One form to another form.
8. Program using Include () and Session ().
9. Program to Display the records from MySQL.
10. Program to Add, Edit and Delete the records from MySQL.
11. Creating a Dynamic Website for your Institution.
12. Creating a Dynamic Website for Online Shopping.

15UCASBCP601/ 15UCSSBCP601	SBC IV: COMPUTER HARDWARE AND NETWORKING	SEMESTER - VI

Theory Part (Not for Written Examination, only for Practical)

CONTENTS

PC Components, Features, and System Design: - Motherboards and Buses: Motherboard form factors - Processor Sockets/Slots -Motherboard connectors - System Bus Types Functions and Features - Types of I/O buses. **Building or Upgrading Systems:** System Components – Hardware and Software Resources – System Assembly and Disassembly – Motherboard Installation – Troubleshooting New Installations – Installing the Operating System - Disassembly/Upgrading Preparation**. PC Diagnostics, Testing and Maintenance**: Diagnostics Software - PC Maintenance Tools - Preventive Maintenance.

Linux Basics: What is Linux?– What you can do with Linux– The Varieties of Linux - Understanding a network (TCP/IP) - Network Essentials. **Installing Linux- Mastering the Basic Operations of Linux - Registering as a Linux user - Using LINUX as a File Server From Windows - Making Web pages for Intranet Use.**

REFERENCE BOOKS:

1. *Scott Mueller*. 2008. **Upgrading and Repairing PCs**. [Eighteenth Edition]. Pearson Education, New Delhi.
2. *Hide Tsuji and Takashi Watanabe*. 2000. **Setting Up a Linux Server**. [First Edition]. Coriolis Open Press and Dreamtech Press, India.

LIST OF PRACTICAL:

1. Identification of various Components, External Ports and Interfacing.
2. Assembling a PC.
3. Disassembling a PC.
4. Upgrading the System Components
    a. Adding New Memory.
    b. Upgrading the CPU.
    c. Upgrading the System Board.
5. Partitioning, Formatting and Installing Windows Operating System.
6. Installing Application Software's and Utilities
    a. MS Office.
    b. Anti-Virus.
7. Installing LINUX (Red Hat LINUX).
8. Creating Users, Groups and Basic File Operations and Mounting CD – ROM.
9. Linux Networking: Setting up TCP/IP.
10. Configuring LINUX as a Windows File Server using SAMBA.
11. Creating Web Server Using Apache.
12. Implementing Peer to Peer Networking Connection.

15UCSN301	**NMEC: INTERNET TECHNOLOGY** **(Course offered to other than Computer Science students)**	**SEMESTER - III**

Total Hours: 26

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamentals of Internet, Connectivity and its Resource Requirements.
2. Mailing system and applications of Internet.

CONTENTS

UNIT- I **(4 Hours)**

Introduction to internet: What is Internet? - Evolution and History of Internet- Growth of Internet-Owners of Internet- Internet Services- How does the Internet Works? - Anatomy of Internet- Internet Addressing- Internet vs. Intranet- Impact of Internet- Governance of Internet.

UNIT- II **(6 Hours)**

Internet Technology and Protocol: ISO-OSI Reference Model**- Internet Connectivity:** Getting Connected- Different Types of Connections- Levels of Internet Connectivity- Internet Service Provider.**Internet Tools and Multimedia:** Current Trends on Internet- Multimedia and Animation.

UNIT- III **(6 Hours)**

WWW and WebBrowser:WWW- Evolution of Web- Basic Elements of WWW- Web Browsers- Search Engines- Search Criteria. **Web Publishing:** Web Publishing- Web Page Design.

UNIT- IV **(5 Hours)**

Email:E-Mail Basics- E-Mail System- E-Mail Protocol- E-Mail Addresses- Structure of an E-Mail Message- E-Mail Clients & Servers- Mailing List- E-Mail Security.

UNIT- V **(5 Hours)**

Usenet and Internet Relay Chat: What is Usenet? - Newsgroup Hierarchies- What is a Newsreader? - How do you Read Newsgroups? - Who Administers Usenet?- Common Newsreading Tasks- How to Read Articles from Network News?- Relationship between Netnews and E-Mail- What is IRC?- Channels- Nicknames- Microsoft Net Meeting. **Internet and Web Security**: Overview of Internet Security-

Aspects and Need of Security-E-Mail Threats and Secure E-mail-Web Security and Privacy Concepts-Firewall.

TEXT BOOK:

1. *ISRD Group*. 2012. **Internet Technology and Web Design.** [Fourth reprint]. Tata McGraw-Hill Education Private Limited., New Delhi.

REFERENCE BOOKS:

1. *Deitel, H.M Dietel, P.J. and Goldberg A.B*. 2008. **Internet & World wide Web- How to Program.** [Third Edition]. PHL, New Delhi.
2. *Comdex.* 2000. **Teach yourself computers and the internet visually**. [First Edition]. IDG Book India (p) Ltd.
3. *Ramachandran, T.M. Nambissan*. 2003. **An Overview of internet and web development**. [First Edition]. T M - Dhruv Publications.

15UCSN401	NMEC: HTML AND WEB DESIGNING (Course offered to other than Computer Science students)	SEMESTER- IV

Total Hours: 26

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamentals of basic programming language for World Wide Web.
2. How HTML is used to build basic web pages?

CONTENTS

UNIT - I **(6 Hours)**

Getting Started with HTML: HTML and XHTML Basics: Understanding HTML - Setting Up the Document Structure – Formatting Text by Using Tags.

UNIT - II **(5 Hours)**

Getting Started with HTML: Using Lists and Backgrounds – Creating Hyperlinks and Anchors.**Style Sheets and Graphics:**Displaying Graphics.

UNIT - III **(5 Hours)**

PageLayout and Navigation: Creating Tables – Formatting Tables.

UNIT - IV **(5 Hours)**

PageLayout and Navigation: Creating Division-Based Layouts – Creating User Forms.

UNIT - V **(5 Hours)**

PageLayout and Navigation: Using Frames for Layout – Incorporating Audio and Video.

TEXT BOOK:

1. *FaitheWempen*. 2006. **Microsoft Step by Step HTML an XHTML.** [First Edition]. PHI, New Delhi.

REFERENCE BOOK:

1. *Xavier*, C. 2007**. World Wide Web Design with HTML**. [First Edition]. TMH, New Delhi.

15UCAD401	DIPLOMA IN ANIMATION Part I: The Art of 3D Animation (Theory)	SEMESTER - III

Total Hours: 45

OBJECTIVE:

The subject aims to build the concepts regarding:

1. Three Dimensional Modeling, Rendering Process, Lighting and Animation Techniques.

CONTENTS

UNIT - I **(9 Hours)**

Basic Modeling Concepts: Space, Objects, and Structures– Building with Numbers– Points, Lines and Surfaces– Moving Things Around– File Formats for Modeling– **Basic Modeling Techniques**– Introduction– A Note About Lines– Geometric Primitives– Sweeping– Freeform Objects– Basic Modeling Utilities– Groups and Hierarchical Structures.

UNIT - II **(9 Hours)**

Advanced Modeling Techniques: Freeform Curved Surfaces– Logical Operators and Trimmed Surfaces– Advanced Modeling Utilities– Procedural Descriptions of Natural Phenomena. **Overview of the Rendering Process**: Lights, Camera, and Materials– Steps in Rendering Process– Rendering Methods.

UNIT - III **(9 Hours)**

Lighting: Types of Light Sources– Basic Components of a Light Source– Basic Positions of Light Sources. **Shading and Surface Characteristics:** Surface Shading Techniques.

UNIT - IV **(9 Hours)**

Basic Concepts of Animation: Principles of Animation– Storytelling– Story boarding– Character Sheets- Production Issues– Animation File Formats.

UNIT - V **(9 Hours)**

Basic Animation Techniques: Principles of Key frame Interpolation– Model Animation– Camera Animation- Light Animation– Hierarchical Animation.

TEXTBOOK:

1. *Isaac Victor Kerlow.* 1998. **The Art of 3-D Computer Animation and Imaging.** [First Edition].Galgotia Publication Pvt. Ltd, New Delhi.

REFERENCE BOOKS:

1. *Kelly, L. Murdock*. 2010. **3ds Max 2010.**[First Edition].Wiley India Pvt. Ltd., New Delhi.
2. *Trived*i, *M.C.* 2009. **Computer Graphics & Animation.** [First Edition] JAICO Publishing House, India.

15UCSA401	DIPLOMA IN ANIMATION Part II: 3D Animation Lab (Practical)	SEMESTER - IV

Total Hours: 45

LIST OF PRACTICAL:

3D Max:

1. Working With Standard Primitives.
2. Drawing Regular and Irregular objects with Primitives.
3. Creating a Three Dimensional Logo.
4. Creating Text Animation Using Multiple Layers.
5. Applying Various Transformations for a Model.
6. Cloning the Objects.
7. Creating a Model and Applying a Standard Material.
8. Applying Lighting Effect for a Model.
9. Designing and Animating a Rolling Ball.
10. Creating Three Dimensional Characters.
11. Creating a New Innovative character and making a Small Action.
12. Exporting 3D Max File Format into other File Format.

15UCAD402	DIPLOMA IN OFFICE AUTOMATION AND DTP Part I: Office Automation(Theory)	SEMESTER - III

Total Hours: 27

OBJECTIVE:

The subject aims to build the concepts regarding:

1. How effectively utilize the office package for automating the documents and manipulating the same with different representations?

CONTENTS

UNIT - I **(9 Hours)**

Microsoft Word: Exploring MS Word 2007– Starting MS Word 2007- The MS Word 2007 Work Space. **Preparing the First Document:** Considerations before preparing a Document- Setting Size, Margin and Orientation of a Document-Typing the Text-Inserting a Table-Saving the Document-Printing the Document- Closing the Document.**Creating Form Letters, E-mail Messages and Labels:** Creating a Mail Merge Document-Sending a Personalized E-Mail Message to Multiple Recipients-Modifying records in the Data Source- Envelopes and Labels.

UNIT - II **(9 Hours)**

Microsoft Excel: Starting with Excel 2007-Starting Microsoft Excel 2007-Working with Spread sheet. **Preparing the First Excel Worksheet**: Entering Data in Work sheet-Formatting Cells- Setting the format and other properties of a Work sheet-Saving Workbook- Preparing Work sheet for Printing. **Conditional Formatting, Sorting, and Filtering Data:** About Conditional Formatting—About Sort and Filter feature-**Charts and Smart Art**-: Selecting the Chart type- Setting the Chart Options-Resizing and positioning the Charts in a Work sheet- Converting a Chart type into another type- Working with Smart Arts. **Functions in Excel**: Defining basics of a Function- Using Arithmetical Functions.

UNIT - III **(9 Hours)**

Microsoft PowerPoint: Beginning with Microsoft PowerPoint: Exploring Microsoft Power Point 2007- Applying the Tool tips- Setting Power point options. **Preparing**

the First Presentation: Understanding the structure of a presentation- Creating a new Presentation- Working with themes- Working with Text-Moving and Deleting slides- Saving a Presentation in different formats- Closing a Presentation- Opening a Presentation.**Charts, Graphics and Tables**: Working with Charts –Adding graphics in a Presentation- Working with Tables- Adding Movie Clips- Adding Sound Clips- Working with the Print Option. **Adding Animations in Slides:** Using Animation**-** Applying Custom Animation- Applying Transitions to the Slide- Previewing Animation- Removing Animation- Adding actions to an object.

TEXT BOOK:

1. *Vikas Gupta.* 2010. **Comdex Computer Course Kit Windows XP with Office 2007**.[First Edition]. Dreamtech Press, New Delhi.

REFERENCE BOOK:

1. *LP Editorial Board. 2008.* **First Lessons in Microsoft Office 2007**. [First Edition]. Law Point, Kolkata.

15UCAD402	DIPLOMA IN OFFICE AUTOMATION AND DTP Part I: Office Automation (Practical)	SEMESTER – III

Total Hours: 18

LIST OF PRACTICAL:

Microsoft Word

1. Working with Font Properties (Font face, Size, Color, Character spacing and Text Effects) and Paragraph (Aligning, Indentation & Spacing)
2. Working with Page Setup **(**Setting Margins, Changing Page Size, Changing Page Orientation and Applying Page Background)
3. a. Working with Table and Double Column Document.
   b. Working with Page numbering, Header & Footers and Picture & Shapes.

Microsoft Excel

4. a. Entering Data and formatting the cells.
   b. Working with Sorting and Filtering.
5. a. Working with Charts for Sample Data.
   b. Writing Functions.

Microsoft PowerPoint

6. a. Creating New Presentation (Blank Slide & Template)
   b. Working with Themes (Color Themes & Background Theme)
7. a. Working with Chart. (Inserting, Editing and Past Char in other Slides)
   b. Adding Animation in Slides (Applying Custom Animation and Transitions to Slides)

15UCAD402	DIPLOMA IN OFFICE AUTOMATION AND DTP Part II : DTP Packages(Theory)	SEMESTER – IV

Total Hours: 27

OBJECTIVES:

The subject aims to build the concepts regarding:

1. The ability to work with DTP Packages and Expertise in making DTP Applications
2. Publishing Tools and Image Editing Tools.

CONTENTS

UNIT - I **(9 Hours)**

PageMaker : Getting Started with PageMaker 6.5 / 7 – Editing Text - Formatting Text – Working with Graphics and Objects.

UNIT - II **(9 Hours)**

CorelDRAW : CorelDraw Basics – Drawing and Selecting – Working with Images – Page Layout and Background.

UNIT - III **(9 Hours)**

Photoshop: Getting Started with Photoshop – Working with Images and Colors – Making Selections – Painting and Editing Tools – Layers.

TEXT BOOK:

1. Vikas Gupta. 2002**. Comdex DTP Course Kit.** [First Edition].DreamTech Press, New Delhi.

REFERENCE BOOKS:

1. *Martin Matthews, S. and Carole Boggs Mathews.* 1997. **The Official Guide toCorelDRAW! 6 for Windows 95**. [First Edition]. Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. *Eileen Mullin.* 1996. **The Essential Photoshop Book ™.** [First Edition]. Prima Publishing, USA.

15UCAD402	DIPLOMA IN OFFICE AUTOMATION AND DTP Part II: DTP Packages(Practical)	SEMESTER – IV

Total Hours: 18

LIST OF PRACTICAL:

PageMaker

1. a. Working with Text (Entering the Text, Size, Style and Align)
   b. Working with Graphics (Creating, Wrapping Text, Importing)
2. a. Managing a Publication (Page Orientation, Numbering, Size, Dimensions and Margins)
   b.Creating Master Page and Applying it to a Publication.

CorelDRAW

3. a. Working With Text (Size, Arranging, Decorating, Type Style, Spell-Checking and Kerning).
   b. Working Graphics (Drawing, Editing, Texturing)
4. a. Working with Page Layout (Page Size & Layout Styles).
   b. Working with Background (Bitmap to Background)

PhotoShop

5. a. Working with Images (Scanning, Image size, Resolution, Rotating and Cropping)
   b. Working with Painting Tools (Paintbrush Tool, Brush Palette, Gradient and Paint Bucket)
6. a. Working With Editing Tools (Blur, Sharpen, Smudge, Clone, Toning and Eraser)
   b. Working with Layers (Creating, Deleting, Hiding/Showing, Merging and Effects).

15UCAD403	**DIPLOMA IN NETWORK INFRASTRUCTURE DESIGN** **Part I: Network Infrastructure Design (Theory)**	**SEMESTER – III**

Total Hours: 27

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Planning, Implementing, Managing, Maintaining and Securing Microsoft Windows Server.
2. How to Configure and Manage a Network?

CONTENTS

UNIT - I **(8 Hours)**

Analyzing the IT Management Structure: How does IT get Funded?-Centralized or Decentralized IT Structure?-Identifying Outsourcing Risks and Strategies. **Evaluating the Technical Environment**: Planning Company Resource Distribution and Management-Evaluating Centralized Vs. Decentralized Resources-Assessing Network Connectivity-How Do Users Use the Network?-Service Requirements-How is the Network Managed?-Analyzing network Security Considerations. **Anticipating the Impact of Infrastructure Design:** Defining your Enterprise Network Applications-Evaluating the Current Network Environment-Assessing Network Service-Assessing the TCP/IP Infrastructure Assessing Current Hardware-Identify Existing and Planned Upgrades and Rollouts-What is the Current Technical Support Structure?-How is the Network Being Managed Today?

UNIT - II **(9 Hours)**

Analyzing Client Access Requirements: Determining the Needs and Behaviors of End Users-What are the Plans for This Network's Future?.**Analyzing the Current Disaster Recovery Strategy**: Defining Fault Tolerance and Disaster Recovery-Establishing Fault Tolerance and Disaster Recovery for Client Computers-Establishing Fault Tolerance and Disaster Recovery for Servers-Establishing Fault Tolerance and Disaster Recovery for the Network.

UNIT - III **(10 Hours)**

Designing a Management and Implementation Strategy for Windows 2000 Networks: Understanding Windows 2000 Networking Services-Designing and Modifying a Network Topology-Monitoring and Managing Windows 2000 Network Services-Network Load balancing-supporting Application Architectures. **Designing**

TCP/IP into Your Network: The advantages of Widows 2000 TCP/IP-Analyzing IP Subnets-Choosing Software Routing- Integrating TCP/IP into Existing WAN Environments. **Designing a DHCP Solution:** Introduction to DHCP-Interoperability with Routers-Designing and Placing Servers-DHCP Server Security-Optimizing and Tuning DHCP.

TEXT BOOK:

1. *Bill Heldman.* 2000. **MCSE: Windows 2000 Network Infrastructure Design Study Guide.** [First Indian Edition]. BPB Publications, New Delhi.

REFERENCE BOOK:

1. *Tom Shinder and Deb Little John Shinder.*2000. **MCSE Windows 2000 Server Study Guide.** [First Edition]**.** Tata Mcgraw Hill Publications, New Delhi.

15UCAD403	**DIPLOMA IN NETWORK INFRASTRUCTURE DESIGN** **Part I: Network Infrastructure Design (Practical)**	**SEMESTER – III**

Total Hours: 18

LIST OF PRACTICAL:

1. Installation and Configuration of Windows 2000 Server.
2. Installation and Configuration of Windows 2000 Professional.
3. a. Creating User and Group Accounts in Windows 2000 Server.

   b. Establishing Fault Tolerance and Disaster Recovery for Clients and Servers.
4. Customizing network management in Windows 2000 Server environment.
5. Designing and Implementing Windows 2000 network Services.
6. Setting up DHCP Server.

15UCAD403	DIPLOMA IN NETWORK INFRASTRUCTURE DESIGN Part II: Network Infrastructure Design (Theory)	SEMESTER – IV

Total Hours:27

CONTENTS

UNIT - I **(9 Hours)**

Planning a DNS Implementation: Why DNS? -Creating an Integrated DNS Design-Creating a Secure DNS Design-Redundancy of DNS Servers-Designing a DNS Implementation. **Designing a WINS Implementation:** Creating a WINS Design-Creating a Secure WINS Design-Tuning and Optimizing the WINS Infrastructure Design-Designing a WINS Implementation. **Building a Distributed File System Strategy:** Correctly Placing the Dfs Root-Replicating the Dfs Root and Replicas

UNIT - II **(9 Hours)**

Designing for Internet Connectivity: Designing a Proxy Server Implementation-Implementing Internet connection Sharing and NAT-Designing a Web server Access solution- Designing a Mail server Access solution. **Designing a Remote Access Solution:** Designing an RRAS Implementation-Designing a RADIUS Implementation.

UNIT - III **(9 Hours)**

Planning A Routing and Remote Access Implementation: Why Use Demand-Dial Routing in a Network?-Designing A Demand –Dial Routing Implementation. **Planning a Virtual Private Network (VPN) Implementation:** Why Use a VPN?-Designing a VPN Implementation.

TEXT BOOK:

1. *Bill Heldman.* 2000. **MCSE: Windows 2000 Network Infrastructure Design Study Guide.** [First Indian Edition]. BPB Publications, New Delhi.

REFERENCE BOOK:

1. *Tom Shinder and Deb Little John Shinder.*2000. **MCSE Windows 2000 Server Study Guide.** [First Edition]**.** Tata Mcgraw Hill Publications, New Delhi.

15UCSD403	**DIPLOMA IN NETWORK INFRASTRUCTURE DESIGN** **Part II: Network Infrastructure Design (Practical)**	**SEMESTER – IV**

Total Hours: 18

LIST OF PRACTICAL:

1. Administering Volume Sets and RAID Arrays.
2. Creating an integrated and secured DNS design.
3. Tuning and optimizing the WINS infrastructure design.
4. Building a distributed file system strategy.
5. Designing for internet connectivity (Proxy Server Implementation).
6. Implementing RRAS and RADIUS in a new network.

GUIDELINES

1. SUBMISSION OF RECORD NOTE BOOKS AND PROJECT DISSERTATION:
Candidates appearing for Practical Examinations and Project Viva-Voce shall submit Bonafide Record Note Books/ Dissertation prescribed for Practical/ Project Viva-Voce Examinations, otherwise the candidates will not be permitted to appear for the Practical/ Project Viva-voce Examinations.

2. PASSING MINIMUM AND INTERNAL MARK DISTRIBUTION (Theory, Practical and Project)

(i) A. THEORY
The candidate shall be declared to have passed the Examination, if the candidate secure not less than 40 marks put together out of 100 in the Comprehensive Examination in each Theory paper with a passing minimum of 30 marks in External out of 75.

***Internal Marks Distribution** [CA- Total Marks: 25]*

Attendance	: 5 Marks
Assignment	: 5 Marks
Internal Examinations	: 15 Marks
Total	**: 25 Marks**

B. (i) THEORY (If Internal Evaluation is for 100 Marks)
The candidate shall be declared to have passed the Examination, if the candidate secures not less than 40 marks out of 100 in the Comprehensive Examination (Internal Evaluation only).

Internal Marks Distribution

Attendance	: 10 Marks
Assignment	: 30 Marks (3 Assignments Compulsory)
Internal Examinations	: 60 Marks
Total	**: 100 Marks**

For SBC I & II (Technical Skills I & II) Mode of examination is Online and questions are objective type.

(ii) PRACTICAL
The candidate shall be declared to have passed the Examination, if the candidate secures not less than 40 marks put together out of 100 in the Comprehensive Examination in each Practical paper with a passing minimum of 24 marks in External out of 60.

***Internal Marks Distribution** [CA- Total Marks: 40]*

Experiment	: 10 Marks (10-12 Experiments)
Attendance	: 5 Marks
Record	: 5 Marks
Internal Examinations	: 20 Marks
Total	**: 40 Marks**

(iii) PROJECT WORK /DISSERTATION

- The project work shall be carried out by group of students in the V semester and has to complete the work at the end of VI Semester.
- Upon completion of the project work/dissertation the candidate will be required to appear for a viva-voce conducted by an external examiner.
- The Student has to attend 3 reviews before completing his/her Project.
- All 3 reviews will be reviewed by External Resource Person.
- A candidate failing to secure the prescribed passing minimum in the dissertation shall be required to re-submit the dissertation with the necessary modifications.
- The assessment of students' performance in a semester is calculated by Continuous Internal Assessment (CA.) for 40 marks and External Assessment for 60 marks.

The candidate shall be declared to have passed the Examination, if the candidate secure not less than 40 marks put together out of 100 in the Comprehensive Examination in each Project with a passing minimum of 24 marks in External out of 60.

Internal Mark Distribution **[CA - Total Marks: 40 Marks]**

1.	Research work done	:	10 Marks
2.	Attendance	:	5 Marks
3.	Record	:	5 Marks
4.	Review	:	20 Marks (Three reviews)
	Total	**:**	**40 Marks**

(iv) CAREER COMPETENCY SKILLS

1. CCS I

- 100 questions-100 minutes
- Twenty questions from each UNIT.
- On line examination will be conducted at the end of the III Semester.

2. CCS II -Viva Voce (IV Semester)

- A Student has to come in proper dress code and he/she should bring 2 copies of Resume for the Viva Voce.

- A student may be asked to
    - Give Self Introduction
    - Submit the resume to the examiner(s) and answer the questions based on it.
    - Speak on any given topic for at least two minutes.
    - Give a presentation for 10 minutes on a topic of their choice.
    - Sit with other students in a Group for a Discussion.

3. QUESTION PAPER PATTERN AND MARK DISTRIBUTION

***(i) THEORY* (For 75 marks)**
Question Paper Pattern and Mark Distribution

1. **PART – A (10 x 2 = 20 Marks)**
   Answer ALL questions
   Two questions from each UNIT

2. **PART – B (5 x 5 = 25 Marks)**
   Answer ALL questions
   One question from each UNIT with Internal Choice

3. **PART – C (3 x 10 = 30 Marks)**
   Answer ANY THREE questions
   Open Choice – 3 out of 5 questions
   One question from each UNIT

(ii) *THEORY* (100% Internal & External Evaluation)
Question Paper Pattern and Mark Distribution

1. **PART – A (10 x 2 = 20 Marks)**
   Answer ALL questions
   Two questions from each UNIT

2. **PART – B (5 x 7 = 35 Marks)**
   Answer ALL questions
   One question from each UNIT with Internal Choice

3. **PART – C (3 x 15 = 45 Marks)**
   Answer ANY THREE questions
   Open Choice – 3 out of 5 questions
   One question from each UNIT

(iii) PRACTICAL
Question Paper Pattern and Mark Distribution [Maximum Marks 60]

Question Paper Pattern

- Practical Examinations shall be conducted at the end of concern Semester.
- Student shall write two questions as examiners choice from the practical list.

External Marks Distribution [CE- Total Marks: 60]
For each practical question the marks shall be awarded as follows:

i) Aim	: 5 Marks
ii) Algorithm / Flowchart	: 10 Marks
iii) Writing the Source Code	: 15Marks
iv) Test and debug the Source Code	: 15 Marks
v) Displaying the Output	: 10 Marks
vi) Result Declaration	: 5 Marks
Total	**: 60 Marks**

(iv) PROJECT WORK /DISSERTATION:

External Mark Distribution **[EA – Total Marks: 60 Marks]**

1. Documentation	: 20 Marks
2. Presentation	: 20 Marks
3. Viva Voce	: 20 Marks
Total	**: 60 Marks**

Marks may be proportionately reduced for the errors committed in each of the above.