BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY REGULATIONS

ELIGIBILITY

Candidates for admission to the first year of the **Bachelor of Science (Information Technology)** Degree course shall be required to have passed in the Higher Secondary Examinations conducted by the Government of Tamil Nadu in the relevant subjects or an Examination accepted as equivalent thereto by the Academic Council. Subject to such other conditions as may be prescribed there to are permitted to appear and qualify **with any one of the following subjects**: Mathematics / Computer Science / Statistics / Business Mathematics and wherever the students have not studied Mathematics, the necessary Mathematics knowledge be imparted through Tutorial/ Bridge Course.

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 Information Technology and its applications.
2. Analysis and synthesis involved in Computer System, Information System and Computer applications.
3. To develop a software and in its design and implementation for professional competence
4. To equip and train the students to meet the requirement of the IT Industries and Public Sectors.
5. To stimulate an interest in computing as an academic discipline with a view to encouraging progression to research and higher studies.

SCHEME OF EXAMINATIONS FOR UG COURSE (CBCS PATTERN)

For Candidates admitted from the academic year 2016 - 2017 onwards

Course	Subject	Hrs of Instruction	Exam Duration (Hrs)	Max Marks			Credit Points
				CA	CE	Total	
First Semester							
Part – I							
16UTL11T/ 15UHL11H/ 15UML11M/ 15UFL11F	Tamil-I/ Hindi-I/ Malayalam-I/ French – I	6	3	25	75	100	4
Part – II							
16UEG12E	English - I	6	3	25	75	100	4
Part – III							
16UIT13A	**Core - I** : C Programming	4	3	25	75	100	4
16UIT13B	**Core - II** : Digital Fundamentals and Architecture	4	3	25	75	100	4
16UMA1AD	**Allied - 1** : Mathematical Structures for Computer Science	5	3	25	75	100	4
16UIT13P	**Core Practical - I** : Programming in C	3	3	40	60	100	4
Part – IV							
15UFC1FA	**Foundation Course - I** : Environmental Studies #	2	3	-	50	50	2
		30				**650**	**26**
Second Semester							
Part – I							
16UTL21T/ 15UHL21H/ 15UML21M/ 15UFL21F	Tamil-II/ Hindi-II/ Malayalam-II/ French – II	6	3	25	75	100	4

20/6/16

B.Sc Chairman/HoD
Department of Information Technology
Dr. G. P. Arts and Science College
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Part – II							
16UEG22E	English - II	6	3	25	75	100	4
Part – III							
16UIT23A	**Core - III** : C++ Programming	5	3	25	75	100	4
16UMA2AD	**Allied - II** : Computer Based Optimization Techniques	5	3	25	75	100	4
16UIT23P	**Core Practical - II** : Programming in C++	4	3	40	60	100	4
16UIT23Q	**Core Practical - III** : Internet and Office Automation	2	3	20	30	50	2
Part - IV							
15UFC2FA	**Foundation Course - II** : Value Education : Human Rights #	2	3	-	50	50	2
		30				**600**	**24**
Third Semester							
Part – III							
16UIT33A	**Core - IV** : Data Structures	6	3	25	75	100	4
16UIT33B	**Core - V** : Java Programming	6	3	25	75	100	4
15UIT3AA	**Allied – III** : Cyber Security	5	3	25	75	100	4
16UIT33P	**Core Practical - IV :** Programming in Java	5	3	40	60	100	4

Part-IV							
16UIT3SA	**Skill Based Subject - I** : Introduction to Web Design and Applications	4	3	20	55	75	3
15UFC3FA/ 15UFC3FB/ 15UFC3FC/ 15UFC3FD/ 15UFC3FE	Tamil @ / Advanced Tamil# (OR) Yoga for Human Excellence# / Women's Rights#/Constitution of India#	2	3	-	50	50	2
	NMEC-I	2	3	-	50	50	2
		30				**575**	**23**
Fourth Semester							
Part – III							
16UIT43A	**Core - VI** : System Software and Operating System	6	3	25	75	100	4
16UIT43B	**Core - VII** : Relational Database Management System	6	3	25	75	100	4
15UIT4AA	**Allied - IV**: Software Engineering and testing	5	3	25	75	100	4
16UIT43P	**Core Practical - V** : Relational Database Management System	6	3	40	60	100	4

Part – IV							
15UIT4SP	**Skill Based Practical - I** : HTML, XML and Java Scripts	3	3	30	45	75	3
	NMEC-II	2	3	-	50	50	2
15UFC4FA/ 15UFC4FB/ 15UFC4FC/	Tamil@ /Advanced Tamil #(OR) General Awareness#	2	3	-	50	50	2
		30				**575**	**23**
Fifth Semester							
Part – III							
16UIT53A	**Core - VIII**: Data Communication and Networks	6	3	25	75	100	4
16UIT53B	**Core - IX**: DOT NET Programming	6	3	25	75	100	4
	Elective - I :	5	3	25	75	100	4
16UIT53P	**Core Practical - VI** : Programming in Dot Net	5	3	40	60	100	4
Part - IV							
15UIT5SA	**Skill Based Subject - II** : Open Source Tools	4	3	20	55	75	3
16UIT5SP	**Skill Based Practical – II** : Programming in Open Source Tools	4	3	30	45	75	3
16UIT53T	**Industrial Training**	Grade A to C					
		30				**550**	**22**

Sixth Semester							
Part – III							
16UIT63A	**Core - X**: PHP and MySQL	6	3	25	75	100	4
	ELECTIVE - II :	6	3	25	75	100	4
	ELECTIVE - III :	6	3	25	75	100	4
16UIT63P	**Core Practical - VII** : Programming in PHP and MySQL	6	3	40	60	100	4
16UIT63V	**Core XI** : Project and Viva Voce	6	3	40	60	100	4
Part-V							
16UEX65A	Extension Activity@	-	-	50	-	50	2
		30				**550**	**22**
					Grand Total	**3500**	**140**

No Continuous Internal Assessment (CIA), only Comprehensive Examination (CE)

@ No Continuous Internal Assessment (CIA) and Comprehensive Examination (CE)

ELECTIVE – I

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

S.No	Subject Code	Name of the Subject
1.	15UIT5EA	A. Cloud Computing
2.	15UIT5EB	B. AI and Robotics
3.	15UIT5EC	C. Multimedia

ELECTIVE - II

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

S.No	Subject Code	Name of the Subject
1.	15UIT6EA	A. Cryptography And Network Security
2.	15UIT6EB	B. Mobile Computing
3.	15UIT6EC	C. Web Programming

ELECTIVE - III

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

S.No	Subject Code	Name of the Subject
1.	16UIT6ED	D. Big Data
2.	15UIT6EE	E. Data Mining
3.	15UIT6EF	F. Enterprise Information System

NON MAJOR ELECTIVE COURSES

- The department offers the following two papers as Non Major Elective Courses for other than the computer studies related students.
- Student shall select any one of the following subject as Non Major Elective Courses during their III and IV semester

S. No	Semester	Course Code	Course Title
1.	III	16UNM34J	NMEC-I : PC Hardware
2.	IV	16UNM44J	NMEC-II : Photoshop and Flash

Total Credit Distribution

Subjects	Credits	Total		Credits	Cumulative Total
Part I: Tamil	4	02x100 =	200	08	16
Part II: English	4	02x100 =	200	08	
Part III:					
Core	4	10x100 =	1000	40	110
Core Practical	4	06x100 =	600	24	
Core Practical	2	01 x 50 =	50	02	
Project	4	01x100 =	100	04	
Allied Theory	4	04x100 =	400	16	
Elective	4	03x100 =	300	12	
Skill based subject theory	3	02 x 75 =	150	06	
Skill based subject practical's	3	02 x 75 =	150	06	
Part IV:					
Value Education	2	01 x 50 =	50	02	12
Environmental	2	01 x 50 =	50	02	
Foundation Courses	2	02 x 50 =	100	04	
NMEC	2	02 X 50 =	100	04	
Part V:					
Extension Activity	2	01 X 50 =	50	02	02
Total			**3500**	**140**	**140**

FOR COURSE COMPLETION

Students shall complete:

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

  A- 75marks and above

  B- 60-74 marks

  C- 40-59 marks

  Below 40 marks - (Re - Appear)

Earning Extra credits is not mandatory for course completion
Extra credits

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

Rules:

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

1. Student can choose BEC course/ Self study course to earn one credit. They have to Enroll and complete any one of the course during their course period before fifth semester (I semester to V semester).

Self study paper offered by Information Technology Department

S. No.	Semester	Course Code	Course Title
1.	Semester I to V	16UITSS1	Ethical Hacking
2.		16UITSS2	Green Information Technology

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

16UIT13A	CORE-I: C PROGRAMMING	SEMESTER - I

Total Credits: 4
Hours Per Week: 4

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To develop problem-solving strategies, techniques and skills that can be applied to computers and problems in other areas.
2. To help students develop the logic, ability to solve the problems efficiently using C programming.
3. To learn various concepts and techniques for problem solving and will implement those ideas using C programs.

CONTENTS

UNIT – I

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

UNIT – II

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

UNIT – III

Character arrays and strings: Introduction – Declaring and initializing string variables – Reading strings from terminal – Writing strings to screen – String handling functions. User Defined functions: Introduction – Needs & Elements of User Defined function –Definition – Return values and their types – Function calls – Function declaration – Category of functions – Nesting of functions – Recursion – Passing arrays and Strings to functions – The scope, lifetime & Visibility of Variables.

UNIT – IV

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

UNIT – V

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

TEXT BOOK:

1. *E. Balagurusamy*, **Programming in ANSI C**, Tata McGraw Hall, New Delhi, 5th Edition.

REFERENCE BOOK:

1. *Herbert Schildt*, **C: The Complete Reference**, Mc Graw Hill, New Delhi, 4Th Edition
2. *B.L.Juneja*, **Programming in C**, Cengage Learning India

16UIT13B	CORE- II: DIGITAL FUNDAMENTALS AND ARCHITECTURE	SEMESTER - I

Total Credits: 4
Hours Per Week: 4

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To help the students grasp the fundamentals of design as a basic creative activity.
2. The basic building blocks that is the digital circuits has been discussed.
3. To perform conversion between one base to another base and to gain knowledge about number system.

CONTENTS

UNIT - I

Digital Logic Circuits: Digital Computers –Logic Gates – Boolean Algebra-Map Simplification- Combinational Circuits- Flip flops
Digital Components: Integrated Circuits- Decoders – Multiplexers – Registers – Shift Registers

UNIT - II

Data Representation: Data Types – Complements –Fixed Point Representation – floating Point Representation – Other Binary Codes – Error Detection Codes.

UNIT - III

Central Processing Unit: Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control

UNIT - IV

Input – Output Organization: Peripheral Devices - Input – output interface- Asynchronous data transfer-Modes of Transfer- Priority Interrupt – Direct Memory Access – Input- Output Processor.

UNIT - V

Memory Organization: Memory Hierarchy – Main Memory- Auxiliary Memory - Associative memory- Cache Memory- Virtual Memory.

TEXT BOOK:

1. *M. Morris Mano*, **Computer System Architecture**. Third Edition., PHI, 1993.

REFERENCE BOOKS:

1. *V. K. Puri,* **Digital Electronics Circuits And Systems**, Tata McGraw Hill Publication. 2004.
2. *M. Carter,* **Computer Architecture**, Schaum's outline series, Tata McGraw Hill Publication, 2006.

16UMA1AD	ALLIED-I: MATHEMATICAL STRUCTURES FOR COMPUTER SCIENCE	SEMESTER - I

Total credits: 4
Hours per Week: 5

OBJECTIVES:

1. On successful completion of this subject the students should have Understanding the concepts of mathematics.
2. To know about the applications of statistical and numerical methods for Computer Science.

CONTENTS

UNIT -I

Matrices - Introduction - Determination - Inverse of a matrix - Rank of a Matrix - Eigen Value and Eigen vector Problems - Cayley's Hamilton Theorem.

UNIT - II

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

UNIT - III

Numerical Differentiations - Newton's forward Difference - Backward Difference -Sterling's formula.

UNIT - IV

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

UNIT - V

Measures of central tendency: Mean – Median – Mode – Measures of dispersion: Range – Mean deviation - Quartile deviation - Standard deviation.

TEXT BOOKS:

1. *Navanitham, P.A.* 2013. **Business Mathematics & Statistics.** Jai Publishers,Trichy (Unit I and V).
2. *Venkataraman, M.K.* 2004. **Numerical Methods in science & Engineering**. NPC. Revised Edition - (Unit II , III &IV)

REFERENCE BOOKS:

1. *Gupta, S.P. and Gupta, M.P.* 2002. **Business Statistics.** Sultan Chand and Sons.
2. *Kandasamy,P.and Thilagavathi ,K.* 2004. **Numerical Methods .**S.Chand and Company Ltd., New Delhi.

16UIT13P	CORE PRACTICAL- I: PROGRAMMING INC	SEMESTER - I

Total Credits: 4
Hours Per Week: 3

OBJECTIVE:

The subject aims to build the concepts regarding:

1. To impart knowledge on C programming.

LIST OF PRACTICALS:

1. Program to use do and while loop.
2. Program to use for loop.
3. Program to perform magic square of order n, where n > 3 and n is odd.
4. Program to use operators.
5. Program to sort using arrays.
6. Program to use string commands with pointers.
7. Program to use string command with arrays.
8. Program to use recursive function.
9. Program to use structure and array of structures.
10. Program to use function with pointers.
11. Program to use file manipulation commands.
12. Program to use command line argument.

16UIT23A	CORE-III: C++ PROGRAMMING	SEMESTER -II

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

To instill the knowledge on the

1. Basic Object-oriented programming concepts
2. Object Oriented Programming Language C++

CONTENTS

UNIT - I

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

UNIT - II

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

UNIT - III

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

UNIT - IV

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

UNIT - V

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

TEXT BOOK:

1. *Ashok N. Kamthane*, **Object-Oriented Programming with ANSI and Turbo C++**, Pearson Education Publication, 2013.

REFERENCE BOOKS:

1. *E. Balagurusamy,* **Object-Oriented Programming With C++**, Tata Mc-Graw Hill Publication,1998.
2. *Yashvant. P. Kanetkar*, **Let us C++**, BPB, New Delhi, 2007.

16UMA2AD	ALLIED-II : COMPUTER BASED OPTIMIZATION TECHNIQUES	SEMESTER - II

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. On successful completion of this subject the students should have: - Understanding various mathematical applications in industries.
2. Decision making for real time environment.

CONTENTS

UNIT - I

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

UNIT - II

Transportation problem - Assignment problem - Traveling Salesman Problem.

UNIT - III

Game Theory -Concept of Pure and Mixed Strategies -Solving 2 x 2 matrixes with and without saddle point -n x 2 -2 x m games.

UNIT - IV (Derivations not included)

Queuing Theory : Introduction – Queuing system – Characteristics of Queuing system – symbols and Notation – Classifications of queues – Problems in (M/M/1) : (∞/FIFO).

UNIT - V

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

TEXT BOOK:

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

REFERENCE BOOKS:

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

16UIT23P	CORE PRACTICAL- II: PROGRAMMING IN C++	SEMESTER - II

Total Credits: 4
Hours Per Week: 4

OBJECTIVE:

The subject aims to build the concepts regarding:

1. To gain knowledge on C++ programming language.

LIST OF PRACTICALS:

1. Program for number conversion.
2. Program to allocate memory using new operator for 10 integers. Read and display integers.
3. Program to use inline functions.
4. Program to use function overloading.
5. Program to declare class with private member variables. Declare member function as static. Read and display the values of member variable.
6. Program to use friend function in two classes.
7. Program to use Overload operator "+" to concatenate two strings, "= = "to compare two strings.
8. Program for creating class Employee with details and perform salary depending on the grade.
9. Program to illustrate the concept of virtual function.
10. Program to use string commands using Pointers.
11. Program to creating a File and to display the contents of that file with line numbers.
12. Program to merge two files into a single file.

16UIT23Q	CORE PRACTICAL - III: INTERNET AND OFFICE AUTOMATION	SEMESTER - II

Total Credits: 2
Hours Per Week: 2

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To learn basic computer skills with Microsoft Word, Microsoft Excel, Microsoft
2. PowerPoint and Microsoft Access

LIST OF PRACTICALS:

1. Creating a resume and format using MS WORD.
2. Creating a class time table using MS WORD
3. Program to prepare mail merge for parent meeting using MS WORD
4. Program to prepare Student mark sheet using MS EXCEL
5. Creating a chart for result analysis using MS EXCEL
6. Program to prepare a mark list for following conditions using data filter and data sort in MS EXCEL
   a) Prepare mark list in ascending order.
   b) Average is greater than or equal to 60.
   c) Average is between 50 and 60.
   d) Average is below 40
7. Designing an organizational chart for Arts and Science College using POWER POINT
8. Creating a power point presentation to advertise a product using Slide Transition and Custom animation
9. Creating a database to student's Mark sheet using MS Access
10. Creating a data base to employee pay roll using MS Access
11. Creating an E-MAIL ID
12. 12 Program to use Mail ID and SEND information with Signature
13. Program to use Mail ID and send information through attached file

16UIT33A	CORE- IV: DATA STRUCTURES	SEMESTER - III

Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

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

CONTENTS

UNIT - I

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

UNIT - II

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

UNIT - III

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

UNIT - IV

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

UNIT - V

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

TEXT BOOK:

1. *Horowitz, Shani, Anderson – Freed,* **Fundamentals of Data Structures in C**,2nd Edition, Universities Press. (Unit I – Unit – V).

REFERENCE BOOKS:

1. *Ellis Horowitz, Sartaj Shani*, **Data and File Structures**, Galgotia Publication (Unit IV – Unit – V)
2. Malik.D.S., **Data structures using C++,** 1st Edition, Cengage learning, 2003
3. *Vaugha H.Patil*, **Data Structures Using C++**, 1st Edition, Oxford Higher Education, 2012

16UIT33B	CORE- V: JAVA PROGRAMMING	SEMESTER - III

Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

To inculcate the knowledge on the

1. Basic Object-oriented programming concepts
2. Object Oriented Programming Language Java

CONTENTS

UNIT - I

Introduction to Object-Oriented Programming – The Java language – Variable Declarations and Arrays – Operators in Java.

Control Statements**:** Introduction – Selection Constructs – Iteration Constructs – Jump Constructs.

Introduction to Classes**:** Instance variables – Class variables – Instance Methods – Constructors – Class Methods – Declaring Objects

UNIT - II

Classes and Methods in Detail**:** Method Overloading – Constructor Overloading – The this Reference – Using Objects in Method – Recursion – Access Modifiers – Inner Classes – Command Line Arguments. Inheritance: Basics of Inheritance – Super Class Variable and Subclass Object – The super reference – Constructor Chaining – Method Overriding – The final Keyword.

Abstract Classes and Interfaces**:** The abstract Classes and Methods – Defining Interface – Implementing Interfaces – Extending Interface – Interface Reference.

Exception Handling: Types of Exceptions-Uncaught Exceptions – Handling Exceptions – User Defined Exceptions

UNIT - III

Multithreaded Programming: Concept of Threads – Thread Creation – Thread's Life Cycle – Thread Scheduling – Synchronization and Deadlock.

Packages and Access Modifiers: Packages – An Introduction – The package Declaration – The import Statement – Illustration Package – The Java Language Packages.

Handling Strings: Creating Strings – Operations on Strings – Character Extractor Methods – String Comparison Methods

UNIT - IV

Input Output Classes: Input and Output Operations – Hierarchy of classes in java.io Package – File class – Input Stream and Output Stream-Random Access File Class.

Applets: Applet Basics – Applet Life Cycle – Running Applets – Methods of the Applet Class

UNIT - V

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

TEXT BOOK:

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

REFERENCE BOOK:

1. *E.BalaGurusamy,* **Programming with JAVA – A Primer**, Tata McGraw-Hill Publishing Company Limited, Third Edition, 2007.

15UIT3AA	ALLIED-III: CYBER SECURITY	SEMESTER - III

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Security attacks and services, using Algorithms to prevent attacks.
2. Cyber security Measures, Organizational structures and International Cooperation for Cyber security.

CONTENTS

UNIT - I

Security trends – Attacks and Services – Classical Crypto Systems – Different types of Ciphers – LFSR sequences – Basic Number Theory – Congruence's – Chinese Remainder Theorem – Modular Exponentiation – Fermat and Euler's Theorem – Legendre and Jacobi Symbols – Finite fields – Continued fractions.

UNIT - II

Simple DES – Differential Cryptanalysis – DES – Modes of operation – Triple DES – AES – RC4 – RSA – Attacks – Primality Test – Factoring.

UNIT - III

Discrete Logarithms – Computing Discrete Logs – Diffie-Hellman Key exchange – ElGamal Public Key Cryptosystems – Hash functions – Secure Hash – Birthday Attacks – MD5 – Digital Signatures – RSA – ElGamal – DSA.

UNIT - IV

Cyber security: Objectives – Definition – Cyber security - Technical and Procedural Measures of Cyber security.

UNIT - V

Organizational Structures : Introduction – Organizational Structures and Policies for Cyber security – A Framework for Organizational Structures – NCSec Referential – International Cooperation for Cyber security.

TEXT BOOKS:

1. *Wade Trappe, Lawrence C Washington*, 2007. **Introduction to Cryptography with Coding theory**, Second Edition, Pearson. (Units I, II, III)
2. **ITU Global Cyber security Agenda (GCA), High-Level Experts Group (HLEG) Global Strategic Report**, 2008. ITU First Printing. (Units IV, V)

REFERENCE BOOKS:

1. *William Stallings*, **Cryptography and Network Security Principles and Practices**, Fourth Edition, Pearson/PHI, 2006.
2. *W. Mao*, **Modern Cryptography – Theory and Practice**, Second Edition, Pearson, 2007.

16UIT33P	CORE PRACTICAL- IV: PROGRAMMING IN JAVA	SEMESTER - III

Total Credits: 4
Hours Per Week: 5

OBJECTIVE:

The subject aims to build the concepts regarding:

1. To include knowledge on implementation of algorithm and key concepts using Java.

LIST OF PRACTICALS:

1. Program to use for loop statement.
2. Program to use branching statement.
3. Program to use Class and perform the functions to represent a bank Information Systems
4. Program to use to extract a portion of a character string and print the extracted string.
5. Program to use the concept of multiple inheritance using Interfaces.
6. Program to demonstrate the use of package.
7. Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them.
8. Program to Use Exception Handling Operations.
9. Program to draw several shapes in the created windows.
10. Program to create bar chart.
11. Program to open an existing file and append text to that file.
12. Program to demonstrate the random access file is created and used for both reading and writing data to it.

15UIT3SA	SKILL BASED SUBJECT- I: INTRODUCTION TO WEB DESIGN AND APPLICATIONS	SEMESTER - III

Total Credits: 3
Hours Per Week: 4

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Fundamentals of Electronic Mail.
2. Use of internet and its application.

CONTENTS

UNIT - I

Fundamentals of Electronic Mail: Introduction - Email: Advantages and Disadvantages – User ids, Passwords and Email addresses - Message Components - Message Composition - Mailer Features - E mail Inner Workings - Email Management - MIME Types. Browsing and Publishing ; Introduction – Browser bare bones – Coast – to – Coast surfing – Hyper Text Markup Languages – Web page installation – Web page set up – HTML formatting and hyper link creation

UNIT - II

The internet: Introduction – internet defined – internet history – the way the internet works – internet congestion – Internet culture – Business culture and the internet – collaborative computing and the internet. World Wide Web: introduction the web defined – web browser details – web writing styles – web presentation outline, design, and management – registering web pages.

UNIT - III

Searching the World Wide Web: Introduction – directories, search engines and Meta search engines – search fundamentals – search strategies – how does a search engine works. Telnet and FTP: introduction – telnet and remote login – File transfer – Computer Viruses.

UNIT - IV

Basic HTML: introduction – semantic versus syntactic – based style types – headers and footers – lists – tables – debugging. Advanced HTML: introduction – frames – html forms – CGI scripts – dynamic documents – html tools – next generation html – cascading style sheets.

UNIT - V

News groups, Mailing Lists, Chat rooms and MUDs: introduction – news groups and mailing lists history – mailing list fundamentals – newsgroups and mailing lists availability – chat-rooms – MUDs. Electronic Publishing: introduction – electronic publishing advantages and disadvantages – copy right issues – project Gutenberg and on-line books – electronic journals, magazines and news papers – miscellaneous publishing issues.

TEXT BOOK:

1. *Raymond Greenlaw, Ellen Hepp,* **Fundamentals of the INTERNET and the World Wide Web**, Second Edition, Tata McGraw –Hill Edition, 2005.

16UIT43A	CORE- VI: SYSTEM SOFTWARE AND OPERATING SYSTEM	SEMESTER - IV

Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. To instill the concepts of the functionalities of various system software

2. To inculcate the common functionality of operating system

CONTENTS

UNIT - I

Assembler: Elements of assembly Language programming-A simple assembly scheme-Pass structure of assemblers-Design of Two Pass assembler. Macros and macro processor: Macro Definition and call-Micro Expansions-Nested macro calls. Compilers and Interpreters: Aspects of compilation-Memory allocation-Compilation of expressions – Compilation of control structures-Code optimization-Interpreters.

UNIT - II

Evolution of OS Functions: OS Functions-Evolution of OS functions-Batch processing systems-Multiprogramming systems-Time sharing systems-Real time operating systems-OS structure. Processes: Process definition – Process Control- Interacting Processes-Implementation of Interacting Processes-Threads.

UNIT - III

Scheduling: Scheduling policies-Job scheduling-Process Scheduling - Process management in Unix-Scheduling in multiprocessor OS. Deadlocks: Definition-Resource status modeling-Handling deadlocks-Deadlock detection and resolution-deadlock Avoidance-Mixed approach to deadlock handling.

UNIT - IV

Process Synchronization: Implementing control synchronization-Critical sections-Classical process synchronization problems-Evolution of Language features for process synchronization-Semaphores-Critical regions-Conditional critical regions-Monitors. Inter-process Communication: Inter-process messages-Implementation issues-Mailboxes

UNIT - V

Memory Management: Memory allocation preliminaries-Contiguous memory allocation-Non contiguous memory allocation-Virtual memory using paging-Virtual memory using segmentation. File Systems: Directory Structures-File production-Allocation of Disk space-Implementing file access-File sharing-File system reliability- Unix File System.

TEXT BOOK:

1. *D M Dhamdhere*, **Systems Programming and Operating Systems**, Tata McGraw-Hill Publishing, 1999.2nd Revised Edition

REFERENCE BOOKS:

1. Leland L. Beck, **System Software-An Introduction To Systems Programming**, Pearson Education Publishers, Third Edition. 2003
2. *H.M. Deitel*. **Operating Systems**, Pearson Education Publication, Third Edition. 2003
3. *Achyut S. Godbole.* **Operating Systems**, Tata McGraw Hill Publications, 2002

16UIT43B	CORE -VII: RELATIONAL DATABASE MANAGEMENT SYSTEM	SEMESTER - IV

Total Credits: 4
Hours Per Week: 6

OBJECTIVE:

1. To inculcate knowledge on Relational Database Management System concepts and Programming with Oracle.

UNIT - I

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

UNIT - II

Oracle9i: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - iSQL *Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

UNIT - III

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

UNIT - IV

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

UNIT - V

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

TEXTBOOK:

1. *Nilesh Shah* , **Database Systems Using Oracle** –, 2nd edition, PHI.
2. (UNIT-I: Chapters 1 & UNIT-II: Chapters 3 & 4 UNIT III: Chapters 5 & 6 UNIT-IV: Chapters 10 & 11 UNIT-V: Chapters 12, 13 & 14)

REFERENCE BOOKS:

1. *Arun Majumdar & Pritimoy Bhattacharya*, **Database Management Systems**, TMH, 2007.
2. *Gerald V. Post*, **Database Management Systems**, 3rd edition, TMH.

15UIT4AA	ALLIED -IV: SOFTWARE ENGINEERING AND TESTING	SEMESTER - IV

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Mainly concentrates on software engineering concepts along with some of the methodologies of Testing.
2. Characteristics of software, software evolution, software models.
3. The various phases in software design and the different types of software testing techniques.

CONTENTS

UNIT - I

The evolving role of software – Software characteristics – Software Engineering: A layered technology. Process Models: The Waterfall model, Incremental process model, Evolutionary process models, specialized process models.

UNIT - II

Requirements Engineering: Tasks, initiating - Analysis Model: Requirement analysis, Scenario based modeling, Flow oriented modeling, and Class based modeling. Design Engineering: Design within the context of software, Design process and design quality, Design concepts, Design model. Architectural Design: Software architecture, Mapping data flow into software architecture.

UNIT - III

The seven step testing process: Overview of the software testing process: The cost of computer testing – The Seven step software testing process – Workbench Skills. Organizing for testing: Objective – Workbench – Input – Do procedures –Check Procedures – Output. Developing the test plan: Objective – Concerns - Workbench – Input – Do procedures – Check Procedures – Output.

UNIT - IV

Verification Testing: Overview - Objective – Concerns - Workbench – Input – Do procedures – Check Procedures – Output. Validation Testing: Overview - Objective – Concerns – Workbench – Input – Do procedures – Check Procedures – Output. Analyzing and Reporting test results: Overview - Objective – Concerns - Workbench – Input – Do procedures – Check Procedures – Output.

UNIT - V

Acceptance and operational testing: Overview - Objective – Concerns - Workbench – Input – Do procedures – Check Procedures – Output. Post implementation analysis: Overview - Objective – Concerns - Workbench – Input – Do procedures – Check Procedures – Output.

TEXT BOOKS:

1. *Roger S Pressman*, 2012. **Software Engineering – A Practitioner's Approach**, [Sixth Edition, Fifth Reprint], McGraw Hill, [Unit I & II].
2. *William.E.Perry*, 2008. **Effective Methods for Software Testing**, [Third Edition], Willey India, [Unit III & IV, V].

REFERENCE BOOK:

1. *Richard Fairley*, 2011. **Software Engineering Concepts**, [Twenty Third Reprint], Tata McGraw Hill.

16UIT43P	CORE PRACTICAL- V: RELATIONAL DATABASE MANAGEMENT SYSTEM	SEMESTER - IV

Total Credits: 4
Hours Per Week: 6

OBJECTIVE:

The subject aims to build the concepts regarding:

1. To gain knowledge on ORACLE Database.

LIST OF PRACTICAL:

1. Creating a table and perform various queries using any one Comparison, Logical, Set, Sorting and Grouping operators.
2. Creating a table which demonstrate the use of primary key and foreign key and Generate Reports
3. Create the following table *(PK - Primary Key, FK – Foreign Key)* cat_head, route_head, place_head, route_detail, ticket_detail, ticket_head with the mapping given below: cat_head route_head *(cat_code PK) (cat_code FK)* route_head route_detail *(route_id PK) (route_id FK)* ticket_head ticket_detail *(tick_no PK) (tick_no FK)* place_head route_detail *(place_id PK) (place_id FK)* (i) Alter the table ticket_header to add a check constraint on ticket_no to accept values between 1 and 500 (ii) Alter table route_header to add a column with data type as long.
4. (a) Insert values to above tables (b) Display only those routes that originate in madras and terminate at cochin (c) Display only distinct category code from the table route_header in descending manner. (d) Update the table route_header to set the distance between madras and coimbatore as 500
5. a. Select rows from ticket_details such that ticket number greater than any ticket_number in Ticket_header. B. Select rows from route_header such that the route_id are greater than all route_id in route_detail Where place id is ―100‖ . c. Create view tick from ticket_header with Ticket_no, Origin, Destination, route_id
6. Generate a report from the table ticket_detail for the particular ticket_no

7. a. Write a PL/SQL block to update the bus_station to be ―ERODE‖ where place_id is '01' or ‗05' [place_header] b. Write a PL/SQL block to satisfy the following condition by accepting the route_id as user input. If the distance is less than 500 than update the fare to be 200 .
8. a. Write a Database trigter before insert for each row on the table route_detail not allowing transaction on Saturday / Sunday b. Write a Database trigger before delete for each row not allowing deletion and give the appropriate message on the table route_details
9. Creating PL/SQL Block to update the rate field by 20% more than the current rate in inventory table which has the following fields: Prono, ProName and Rate. After updating the table a new field (Alter) called for Number of item and place for values for the new field without using PL/SQL block.
10. Creating PL/SQL Block using cursor handling methods.
11. Creating a database trigger to implement on master and transaction tables.
12. Creating PL/SQL to use Exception Handling.

16UIT4SP	PART – IV : SKILL BASED PRACTICAL-I : HTML, XML AND JAVA SCRIPTS	SEMESTER - IV

Total Credits: 3
Hours Per Week: 3

OBJECTIVE:

The subject aims to build the concepts regarding:

1. To gain knowledge on HTML, XML and JAVA Scripts.

LIST OF PRACTICALS:

1. Designing a Simple Web Pages using standard HTML tags like, HEAD, TITLE, and BODY
2. Designing a HTML web pages, which make use of INPUT, META, SCRIPT, FORM, APPLET, BGSOUND, MAP
3. Program to Work with various attributes of standard HTML elements
4. Program to use Java Script's Window and document objects and their properties and to give the dynamic functionality to HTML web pages
5. Program to use Java Script snippet which make use of Java Script's inbuilt as well as user defined objects like navigator, Date Array, Event, Number etc.
6. 6 Program to use the form validation in various INPUT elements like Text Filed, Text Area, Password, Selection list etc.
7. Program to use XML web Documents which make use of XML Declaration, Element Declaration, Attribute Deceleration
8. Program to use Internal DTD, External DTD, and Entity Declaration.

16UIT53A	CORE -VIII: DATA COMMUNICATION AND NETWORKS	SEMESTER - V

Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. To instill the knowledge on network communication.
2. To inculcate the knowledge on internet working concepts.

CONTENTS

UNIT - I

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

UNIT - II

Modes of Data Transmission and Multiplexing -**Transmission Errors**: Introduction –Error Classification -Types of error- Error Detection and Correction.

Transmission Media: Guided Media, Unguided Media – **Network Topologies:** Mesh, Star, Tree, Ring, Bus – Switching: Circuit switching, Message switching, Packet switching.

UNIT - III

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

UNIT - IV

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

UNIT - V

TCP: Features of TCP, Relationship between TCP and IP, Ports and Sockets, TCP connections, What makes TCP Reliable, TCP Packet Format **– User Datagram Protocol (UDP):** UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email) – File Transfer Protocol (FTP) .

TEXT BOOK:

1. *Achyut S.Godbole*, **Data Communications and Networks**, Tata McGraw Hill Publications, 2007.

REFERENCE BOOKS:

1. *Behrouz A. Forouzan*, **Data Communications and Networking,** second edition update, Tata McGraw-Hill Publication, 19th reprint, 2007.
2. Andrew S. Tanenbaum, **Computer Networks**, Prentice Hall of India, 3rd Edition, 2000.

16UIT53B	CORE - IX: DOT NET PROGRAMMING	SEMESTER - V

Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. To gain knowledge about the methodologies behind VB.Net and ASP.Net
2. To develop Dot Net based application using ADO.NET and SQL Managed Provide-OLEDB Managed Provider.

CONTENTS

UNIT - I

What is .NET? Introduction - The Vision: Web Services - Heterogeneous Environment - Smart Devices -The Platform - The .NET Framework: Common Language Runtime Class Libraries - Development Tools: Programming Languages-The .NET Framework SDK- Visual Studio .NET- Foundation Services: User Authentication Service.

From C++ to C# : Simple Hello User program C# for C++ Programmes : Primitive Data Types- Member Accessibility - Field Initialization - Type Constructors, Reference and Value Types Arrays , Properties , Indexes , Delegates and Evens - Method Parameters - Implementation Inheritance - Error Handling -Garbage Collections. Common Programming Paradigms: Client-Server Programming - Interface-Based Programming Deployment - Diagnostics & Support: Tracing - Using the Debugger - Documentation.

UNIT - II

Essential of the .NET Framework: .Net Frame Work Overview - Anatomy of the Framework - Installing the Framework- Managed Code Execution. Overview Common Language Runtime: Common Type System - Common Language Specification - Value Types and Reference Types. Microsoft Intermediate Language - Managed Code Execution: Metadata Validation- Code Validation & Verification- JIT Compilation- Code execution. Automatic Memory Management- Garbage Collection-

Generations – Finalization- Disposing Resources- Using I Disposable objects.

UNIT - III

Server controls - post back -Data Binding - Web Server Controls -HTML Server Controls- Validation Controls. Database Access: Error Handling - Database Access Using ADo.NET - Connection - Command, Data Adapter & Dataset - Data Reader, Connection Pooling.

Creating More Advanced ASP.NET Pages: Communicating with the Browser - The Response Object - Cookies - Query String and Forms Collections- Web Config- Session Management and Variable Scope- Session Events- Session Variables- View State Variables - Application Variables.

UNIT - IV

ASP.NET Server Controls. Web Forms Server Controls Recommendation: Validation Controls-Controls that incorporate logic to validate user inputs like a required field, between ranges, or pattern matching. ASP.NET Data Access: Data Binding Server Controls-Viewing Data Collections in a Grid. ASP.NET Caching Mechanism for caching - Dynamic response data. Page Output Caching.

UNIT - V

Web Services: Introduction to web services-Architecture of Web service: Universal Discovery Description and Integration-Web Service Description Language –Accessing-Web service using different Clients.

TEXT BOOKS:

1. *Pradeep Tapadiya* ,**.NET Programming – A practical guide using C#,** Pearson education, 2002 (Unit I & Unit II)
2. *Chris Ullman, John Kauffman*, **Beginning ASP.NET 1.1 with VB.NET 2003**, Wrox Publications. (Unit IV & Unit V)
3. *Hank Meyne & Scott Davis*, **Developing Web Applications with ASP.NET with C#**, Wiley Publishing Company, 2002.(Unit III)

REFERENCE BOOKS:

1. *Richard Blair, Mathew Renolds*, **Beginning VB.NET 2003**, 3rd edition, Wrox Publication
2. *Deitel and Deitel*, **Visual Basic.NET How to Program**, Pearson Education, 2nd edition.
3. *Greg Buczek*, **ASP.NET Developer's Guide**, Tata McGraw-Hill, 2002.

15UIT5EA	ELECTIVE- I: CLOUD COMPUTING	SEMESTER - V

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To learn the different types of cloud computing services.
2. To make a cloud computing application unique, managing and working with cloud security.

CONTENTS

UNIT - I

Defining Cloud Computing: Definition - Cloud Types - Characteristics of Cloud Computing - Role of Open standards - Cloud Architecture: Cloud Computing Stack: Composiblity.

UNIT - II

Infrastructure - Platforms - Virtual Appliances - Communication protocols - Applications – Connecting to the cloud - Cloud Services: Infrastructure as a Service - Platform as a Service - Software as a Service

UNIT - III

Identity as a Service - Compliance as a Service - Platforms: Load balancing and visualization–Understanding Hypervisors - Cloud Security: Securing the Cloud.

UNIT - IV

Securing the data - Moving applications to the cloud - Cloud Storage: Definition – Provisioning –Cloud storage - Cloud Backup solutions - Cloud storage Interoperability

UNIT - V

Moving applications to the Cloud - Case Study: Google Web Services, Amazon Web Services - Microsoft Cloud Services.

TEXT BOOK:

1. *Barrie Sosinsky*, **Cloud Computing Bible**, Wiley India Pvt. Ltd, [Unit I toV], 2011.

REFERENCE BOOKS:

1. *Roger Jennings,* **Cloud Computing with Windows Azure Platform**, Wiley India Pvt. Ltd, 2009..
2. *Miller Michael*, **Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online**, Que Publishing, 2008.

15UIT5EB	ELECTIVE -I: AI AND ROBOTICS	SEMESTER - V

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Heuristic, Hill Climbing, Planning, etc.
2. Introduction to robotics and their applications.

CONTENTS

UNIT - I

The AI Problems – AI technique – Criteria for success – Define the Problem as a state space search – Production System – Characteristics – Problem Characteristics.

UNIT - II

Heuristic Search Techniques: Generate and Test – Hill climbing –Best First Search – Problem Reduction – Constraints Satisfactions – Means End Analysis.

UNIT - III

Knowledge Representation Issues: Approaches to knowledge Representation – The Frame Problem – Computable Functions & Predicates – Resolution – Procedural versus Declarative Knowledge.

UNIT - IV

Fundamentals of Robotics: Introduction, classification of Robots, History of Robots, Advantages and Disadvantages of Robot, Robot components, Robot degree of freedom, Robot joints and coordinates, Robot workspace, Robot reach, Robot languages.

UNIT - V

Sensors: Introduction to internal and external sensors of the robot, Position sensors, Velocity sensors, Acceleration sensors, SONAR and IR sensors, Touch and tactile sensors. **Applications of Robots:** Applications of robots, selection of robots, economic factors and justification for robotic application; safety requirements.

TEXT BOOKS:

1. *Elaine Rich and Kevin Knight*, **Artificial Intelligence**, [Second Edition], Tata McGraw Hill, 1991. [Unit I, II, III].
2. *Craig J J,* **Introduction to Robotics**, **Mechanics and Control**, Pearson Education, New Delhi,2004..
3. *Saeed B Niku*, **Introduction to robotics,** Pearson Education, New Delhi, 2003.

15UIT5EC	ELECTIVE- I: MULTIMEDIA	SEMESTER - V

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Introduction of Multimedia Content, Multimedia Literature.
2. Concepts of Sound, Images and Graphics.
3. Data Compression, Networking Systems and Multimedia Applications.

CONTENTS

UNIT - I

Introduction – Branch Overlapping Aspects of Multimedia Content – Global Structure – Multimedia Literature. Multimedia – Media and Data Streams – Medium.

UNIT - II

Sound/Audio: Basic Sound Concepts – Music –Speech, Images and Graphics: Basic Concepts – Computer Image Processing – Video and Animation: Basic Concepts – Television – Computer Based Animation.

UNIT - III

Data Compression : Storage Space – Coding Requirements – JPEG – MPEG – DVI, Optical Storage Media , Computer Technology – Multimedia Operating System.

UNIT - IV

Networking System: Layers, Protocols and Services, Networks, Metropolitan Area Networks, WAN, Multimedia Communication System.

UNIT - V

User Interfaces, Synchronization, and Abstraction for Programming: Abstraction Levels – Libraries – System Software – Toolkit – Higher Programming Languages Multimedia Application: Introduction – Media Population – Media Compos ion – Media Communication – Trends.

TEXT BOOK:

1. *Ralf Steinmetz & Klara Nahrstedt*, **Multimedia Computing, Communication & Applications**, Pearson Education, *1995*.

REFERENCE BOOK:

1. *Tay Vaughan*, **MULTIMEDIA: Making it Work**, Seventh Edition, *2011*, TMH.

16UIT53P	CORE PRACTICAL - VI: PROGRAMMING IN DOT NET	SEMESTER - V

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Major concepts of creating windows and web applications.
2. To gain knowledge on C# programming language.

LIST OF PRACTICALS

1. Program to display current data and time using delegates and events.
2. Program to add a string to Combo box with value of Textbox when user clicks button control.
3. Program to display hierarchical representations of items with tree view control using Runtime coding.
4. Program to handle user defined Exceptions.
5. Program for Employee details to read and display the data using constructors and member functions.
6. Program to demonstrate the following events:
   i. Click ii. Mouse Down iii. Key Down iv. Form Load
7. Program to create an application for File Menu with Menu items New, Open, Save, Print and Exit & Edit Menu with Menu items Cut, Copy, Paste, Find and Undo.
8. Program to create an application for student information database and perform the following operations:
   i. Addition
   ii. Deletion
   iii. Updation
9. Program to create a login form to check the authentication of the user.
10. Program to create a web form to display the data in a data grid control (purchase database).
11. Program to check the Validate the personal information using the validate controls.
12. Program to Design a simple web site that makes use of Master Pages.

15UIT5SA	SKILL BASED SUBJECT-II : OPEN SOURCE TOOLS	SEMESTER - V

Total Credits: 3
Hours Per Week: 4

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Understood the Linux concept
2. Understood the Unix networking programming
3. Understood the PHP programming Basics
4. Understood Perl programming

CONTENTS

UNIT - I

Introduction to Linux – What every Linux users knows- The shell-The X windows system –Files and Directories.

UNIT - II

Viewing Text – Editing Text – Pattern matching, VI, Ex and Vim editors.

UNIT - III

UNIX Network Programming-Introduction to TCP/IP: Introduction – The Transport Layer TCP and UDP. **Elementary sockets**: Sockets Introduction, Elementary TCP sockets – I/O multiplexing – Socket options.

UNIT - IV

Perl Programming: Perl - Introduction, Perl Basics: - Syntax, Variables, Strings, Numbers, Operators, and Arrays: - Using Arrays, Manipulating Arrays, Associative Arrays, and Chop, Length, and Sub string. Hashes, Arguments, Logic, Looping, Files, Pattern Matching, Environment Variables, Using cgi-lib for Forms.

UNIT - V

File Management PERL: - File Handling, Reading from Files, Appending Files, Writing to Files, File Checking, Reading Directories. **Databases PERL:** - DBI Module, DBI Connect, DBI Query, MySQL Module, MySQL Connect, MySQL SelectDB, MySQL Query.

REFERENCE BOOKS:

1. *Ellen sivever, Aarom weber, Stephen Figgins, Robers Love and Arnold Robbins O'Reilly, 2005.***Linux Ina Nutshell – A desktop Quick Reference**, [Fifth Edition].
2. *Michael Stutz,* 2004. **Linux CookBook,** [Second Edition], SPD Pvt.ltd.
3. *Tom Christinasen & Nathan Torkington, O'Relliy,* 2006. **Perl CookBook**, SPD Pvt.ltd.

16UIT5SP	SKILL BASED PRACTICAL-II: PROGRAMMING IN OPEN SOURCE TOOLS	SEMESTER - V

Total Credits: 3
Hours Per Week:4

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To gain knowledge of PHP.
2. Various methods to implement rich internet applications using PHP.

LIST OF PRACTICALS:

1. Program to use variables and control structures.
2. Program to use PHP loops.
3. Program to use PHP arrays.
4. Program to use Passing variables between pages.
5. Creating a table and inserting records to table in MySQL.
6. Program to use Deleting and updating Operations in MySQL table.
7. Program to use How to Manipulating form elements through PHP.
8. Program to use Connecting PHP to MySQL database.
9. Program to perform the Viewing MySQL table data through PHP.
10. Program to use How to Manipulating MySQL database through PHP.
11. Program to use to check the Validating user login through PHP.
12. Program to upload a file in PHP.
13. Creating a Pay slip for an employee using PHP and MySQL
14. Download a small project module and convert into our Requirement
15. Creating a program for String Manipulation in PERL.
16. Creating a program for Environment Variables in PERL.
17. Reading a data from a file and write the data to another file using PERL.

16UIT63A	CORE- X: PHP AND MYSQL	SEMESTER - VI

Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To implement the web applications using PHP
2. To know about PHP in a detailed manner.

CONTENTS

UNIT - I

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

UNIT - II

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

UNIT - III

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

UNIT – IV

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

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

UNIT – V

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

TEXT BOOK:

1. *Steven Holzner*, **Complete Reference PHP**, Tata Mc Graw Hill, 2008.

REFERENCE BOOKS:

1. *Steve Suehring, Tim Converse, Joyce Park*. **PHP6 MySQL (Bible**), 2009.
2. *Vikram Vaswani*. **The Complete Reference of MySql**, Tata McGraw Hill Publications, 2004.

15UIT6EA	ELECTIVE- II: CRYPTOGRAPHY AND NETWORK SECURITY	SEMESTER - VI

Total Credits: 4

Hours Per Week: 6

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Computer Security Concepts, Architecture and its Mechanisms.
2. Role of an Operating System and basic terminologies of networks.
3. IP Security and Firewalls.

CONTENTS

UNIT - I

Introduction: Overview-Computer security concepts- The OSI security architecture- Security Attacks- Security services - Security mechanisms. - A model for network security.

UNIT - II

Symmetric And Asymmetric Ciphers -Classical Encryption Techniques: Symmetric cipher model – transposition techniques – Rotor machines. Block ciphers and the data encryption standard: Block cipher principles – the data encryption standard (DES) – the strength of DES. Public key cryptography**:** Principles of Public key cryptosystems – the RSA algorithms.

UNIT - III

Cryptographic Data Integrity **-**Cryptographic Hash Function: Applications of Cryptographic Hash Function – Two simple hash functions – Requirements and Security. Message Authentication Codes (MACs): Message Authentication functions – Requirements for MACs – Security of MACs. Digital Signatures: Digital signatures – Digital Signatures standard

UNIT - IV

Network and Internet Security -Transport Level Security: Secure Socket Layer – HTTPS – Secure Shell (SSH).Wireless Network Security: IEEE 802.11 Wireless LAN overview- Wireless Application Protocol Overview- WAP End to End Security.

UNIT - V

IP Security and Firewalls - IP Security: IP Security Overview – IP Security Policy. Firewalls: The need for firewalls – firewall characteristics – types of firewalls.

TEXT BOOK:

1. *William Stallings*,**Cryptography and Network Security**, Fifth Edition, 2011.Pearson.

REFERENCE BOOK:

1. *Behrouza Forouzan*, **Data Communications and Networking**, Fourth Edition, Eleventh Reprint, 2008, Tata McGraw-Hill.

15UIT6EB	ELECTIVE- II: MOBILE COMPUTING	SEMESTER - VI

Total Credits: 4

Hours Per Week: 6

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To learn the basic concepts, aware of the GSM, SMS, GPRS Architecture.
2. To gain the Knowledge of CDMA and 3G Technology.

CONTENTS

UNIT - I

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

UNIT - II

Mobile Computing through Telephony: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI.

UNIT - III

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

UNIT - IV

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

UNIT - V

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

TEXT BOOK:

1. *Asoke.K Talukder, RoopaRYavagal,* **Mobile Computing**, TMH, 2009.

REFERENCE BOOKS:

1. *Raj Kamal*, **Mobile Computing**, Oxford Higher Education, Second Edition, 2012.
2. *Jochen Schillar,* **Mobile Communications,** Second Edition, Pearson Education, *2008.*

15UIT6EC	ELECTIVE- II: WEB PROGRAMMING	SEMESTER - VI

Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Basics of Internet Communication.
2. To gain knowledge on HTML, Java Scripting and web applications.

CONTENTS

UNIT - I

Basics of Internet communication - Hardware elements associated with internet - Internet Services - Internet Protocols - TCP/IP, UDP, HTTP - other Protocols - Telnet - Gopher - Mail and its types - FTP - Remote access and Transaction - Web Indexes - Search Engines.

UNIT - II

Introduction to HTML - Tags and Documents - Link documents using Anchor Tags - Images and Pictures - Tables -HTML Forms - Frames - Framesets.

UNIT - III

Introduction to Scripting - Java Script - Data types - Operators - Variables - Conditional Statements - Functions -Objects - Document object - Image Object - Event Handling - Introduction to VBScript and Perl Script.

UNIT - IV

Introduction to XML - Well formed XML – CSS - XSL - Valid XML - DTD - XSD - Introduction to DOM and SAX.

UNIT - V

Introduction to Dynamic web applications -Active Server Page Basics - ASP Object Model - Collections - Introduction to PHP.

TEXT BOOKS:

1. 1. *Deitel & Deitel*, **Internet and www How to program?**, Prentice Hall, 2010.
2. *David Hunter et al.*, **Beginning XML**, Wrox Publications, 2011.

REFERENCE BOOKS:

1. *Daniel C.Lynch, Marehall T. Rose*, **Internet Systems Handbook**, Addison Wesley, 1993.
2. *Thomas Penny*, **How to do everything with HTML**, *2000.*

16UIT6ED	ELECTIVE- III: BIG DATA	SEMESTER - VI

Total Credits: 4

Hours Per Week: 6

OBJECTIVE:

The subject aims to build the concepts regarding:

1. To learn the recent technologies available in the market dealing with big data

CONTENTS

UNIT - I

Big Data: Characteristics of Big Data- The volume of Data- the Variety- the Velocity of Data-Data in the Warehouse and Data in Hadoop.
Why Data is Important? – When to consider a Big Data Solution- Big Data Use cases: Patterns for Big Data Deployment- IT for IT Log Analytics.

UNIT - II

Big Data: From the Technology Perspective-All about Hadoop: The Big Data Lingo Chapter-The history of Hadoop- Components of Hadoop-Application Development in Hadoop-Getting your data into Hadoop-Other Hadoop Components.

UNIT - III

Just Hadoop?- Integrated Hadoop System- Analytical Databases with Hadoop Connectivity- Hadoop-Centered Companies. Big Data in the Cloud: IaaS And Private Clouds-Platform Solutions-Big Data Cloud platforms compared.

UNIT - IV

The NoSQL Movement: Size, Response, Availability-Changing Data and Cheap Launches-The sacred Cows-other features. The Future of Big Data: More Powerful and expressive tools for Analysis- Streaming Data Processing- Rise of Data Marketplaces- Development of Data Science Workflows and Tools- Increased Understanding of and Demand for Visualization.

UNIT - V

Big Data Analytics in Banking Sector, Manufacturing, Telecommunication and E-commerce.

TEXT BOOKS:

1. *Chris Eaton, Dirk Deroos,Tom Deutsch, George Lapis and Paul Zikopoulos* ,**Understanding Big Data, Analytics for Enterprise Class Hadoop and Streaming Data**, Tata Mc Graw Hill, 2012 Edition. (eBook) (Unit-I and II)
2. *O'Reilly Radar Team* ,**Planning for Big Data**, O'Reilly, 2012.(eBook) (Unit III and IV)

15UIT6EE	ELECTIVE- III: DATA MINING	SEMESTER - VI

Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

The subject aims to build the concepts regarding:

1. To gain knowledge on data mining and Warehousing.
2. To learn the mathematical and algorithmic details of various data association techniques to discover patterns in underlying data (namely mining data).

CONTENTS

UNIT – I

Introduction: Data mining application –- the future of data mining – data mining software - **Association rules mining: Introduction-** data mining techniques and algorithms - K-Nearest Neighbor – Decision Trees – Association Rules – Neural Networks – Genetic Algorithms –basics- task and a naive algorithm- apriori algorithm – improve the efficient of the apriori algorithm – mining frequent pattern without candidate generation (FP-growth) – performance evaluation of algorithms.

UNIT - II

Classification: Introduction – decision tree – over fitting and pruning - DT rules—naïve bayes method- estimation predictive accuracy of classification methods – other evaluation criteria for classification method – classification software

UNIT - III

Cluster analysis: cluster analysis – types of data – computing distances- types of cluster analysis methods - partitioned methods – hierarchical methods – density based methods – dealing with large databases – quality and validity of cluster analysis methods – cluster analysis software. KDD Process – Data Selection – Cleaning – Enrichment – Coding.

UNIT - IV

Web data mining: Introduction- web terminology and characteristics- locality and hierarchy in the web- web content mining-web usage mining- web structure mining – web mining software - **Search engines:** Search engines functionality- search engines architecture – ranking of web pages. OLAP Tools-Data mining case studies.

UNIT - V

Data warehousing: Introduction – Operational data sources- data warehousing Data Warehouse – Need – Designing Decision Support Systems – Guidelines for data warehousing implementation – Data warehousing metadata – Integration with Data Mining – Client / Server and Data Warehousing –Multiprocessing Machine – Cost Justification

TEXT BOOKS:

1. *Gupta.G.K,* **Introduction to Data mining with case studies**, PHI Private limited, New Delhi, 2008.
2. *Pieter Adrians, Dolf Zantinge,* **Data Mining**, Addison Wesley, 1998.
3. *Alex Berson, Stephen J. Smith*, **Data Warehousing, Data Mining & OLAP**, Tenth Reprint, Tata McGraw-Hill Edition, 2007.

REFERENCE BOOKS:

1. *Margaret H. Dunham*, **Data mining introductory and advanced topics**, Sixth Impression, Pearson education, 2009..
2. *Prabhu.C.S.R,* **Data warehousing concepts, techniques, products and an application**, Second Edition, PHI, *2008.*

15UIT6EF	ELECTIVE- III: ENTERPRISE INFORMATION SYSTEM	SEMESTER - VI

Total Credits: 4
Hours Per Week: 6

OBJECTIVE:

The subject aims to build the concepts regarding:

1. Major concepts on Supply Chain Management, ERP and CRM.

CONTENTS

UNIT - I

Business Process Re-Engineering: Innovative or Perish – Waves of Innovation – What a Difference a Century Can Make? – Value Innovation & BPR – Change Management "BPR" Philosophy – Models of "BPR".

UNIT - II

Supply Chain Management : Introduction to SCM – Evolution of Supply Chain Management – E-Business & Drivers of E-Business – Concept of Supply Chain Management – Understanding the SCM.

UNIT - III

Supply Chain Management: SCM Frame Work – EDI, IOS, ECSS – E-Sourcing and Out-sourcing. ENTERPRISE RESOURCE PLANNING**:** Introduction to ERP – Evolution of ERP – Materials Requirement Planning (MRP) – Manufacturing Resource Planning System (MRP II) and Money Resource Planning (MRP III).

UNIT - IV

Enterprise Resource Planning: ERP Packages – SAP – Relationship of ERP with other components of EIS – ERP implementation ERP Packages – SAP – Relationship of ERP with other components of EIS – ERP implementation – Personnel involved in ERP implementation.

UNIT - V

Customer Relationship Management : Introduction to customer Relationship Management (CRM) – Evolution of CRM – Understanding CRM – Framework of CRM – Models of CRM – CRM Technology – Integration with other Enterprise Wide System – CRM in Practice.

TEXT BOOK:

1. *Balasubramaniyan.K, Usha Priya.S, Hema.K,* **Enterprise Wide Information Systems**, Second Edition, 2002.

REFERENCE BOOK:

1. *William, Sawyer, Hetisn,* **Using Information Technology**, [Third Edition], TMH, *2009.*

16UIT63P	CORE PRACTICAL- VII: PROGRAMMING IN PHP AND MYSQL	SEMESTER - VI

Total Credits: 4
Hours Per Week: 6

OBJECTIVE:

The subject aims to build the concepts regarding:

1. To impart knowledge on PHP, MYSQL

LIST OF PRACTICALS

1. Program to send an HTML formatted Email in PHP.
2. Program to do different types of Sorting in PHP.
3. Program to do String Manipulation in PHP.
4. Program to get color code from the user which displays the color name.
5. Program to do calculator functions
6. Program to upload a file in PHP.
7. Program to login authentication using PHP and MySQL.
8. Creating an application using PHP and MySQL.
9. Creating an application using PHP and MYSQL, and generate the reports
10. Creating an application with DML QURIES.
11. Program to demonstrate how a web page can communicate with a web server while a user type characters in an input field
12. Download a small project module and convert into our Requirement
13. Example website
    1. www.phpclasses.com
    2. www.codeguru.com

16UIT63V	CORE- XI: PROJECT AND VIVA VOCE	SEMESTER - VI

Total Credits: 4

Hours Per Week: 6

OBJECTIVES:

The subject aims to build the concepts regarding:

1. Enables the students to enhance their research skills for software development.
2. The project is oriented towards developing the skills, knowledge and attitude needed to make an effective start as a member of the computer / IT profession.

Course Inputs:

- Project is an integral and important component in the last semester (6th semester) and passing the UG Degree. Project is mandatory for all students.
- Project is basically meant for the implementation of the various technologies learned during the five semesters in the real life scenario.

Following guidelines are hereby enlisted for all the students based on the necessity and

Importance of the project

Each student in the UG final year shall compulsorily undergo Project Work in the 6th semester. Projects shall be done individually. Project work shall be done only in the lab provided by the college. Three Project Reviews shall be conducted in which the progress of project work shall be strictly evaluated by respective Project Guides and Project Coordinator. Viva-Voce shall be conducted only in the presence of Industrialists or academicians. Out of the Total of 100 marks, 40% of mark shall be allocated for CIA and 60% for ESE VIVA VOCE

Basic framework

The stages in Project Work are given below:

- The student has to select a project in a related field of Computer Science / Computer Application / Information Technology / Computer Technology.
- Students should do the project in the College.
- We allotted project hours during that semester and students can do their own project or collect data from the organization and get approval from the organization.
- After obtaining the approval from project guide, the student has to carry out the project work.
- Student has to maintain the project work diary. The Project Work carried out should be in accordance with the approved project proposal.
- All communication must be in writing. No verbal communication will be accepted.
- Student should adhere to the timings for submission of various reports as mentioned in the guidelines. No excuse will be entertained in any case.
- Student should prepare a Project Report at the end of his/her work, which his /her supervisor would certify and approve for submission (the Project Report should conform to the Standard Format laid down for Project Report).

The student should submit the Project Report to the college

Guide for the Project:

- Project guide will be allotted by the department to each student.
- Student must report to his/her project guide regularly.

The student can also have a guide who could be the person under whose supervision the student is doing the project in the industry

Selection of Project:

- The selection of the project can be done in consultation with the project guide.
- Group of the students are not allowed to do a single project at a time.

It is possible that a group of students are doing different modules of the same project. In such cases, the student is required to do 3-5 modules of the large project.

Submission of project proposal

- Students are expected to submit an initial project proposal or broad outlines of the project area to the respective guide, who will then forward it to the head of the department.
- All students must submit a synopsis/abstract, preferably, of about 1-2 pages, as project proposal. The content should be as brief as is sufficient enough to explain the objective and implementation of the project.
- If Student get data from the organization, the student should get Confirmation Letter from the organization is required along with the project proposal.

Submission of project report

- The student will submit his/her project report in the prescribed format.
- Project Report will be submitted in triplicate (Hard Bound Copies) with the proper certification by the organization concerned in the specified format and color. None of copies of the project report will be returned to the student.
- The project reports along with a CD should be submitted to the HOD/Supervisor/ Controller of examinations, twenty days prior to the final semester examination.

A certificate from the supervisor should also be enclosed in the Project Report as provided in the format for project report.

Fields for Project:

- **GUI Tools** (**Front End)** - Visual Basic, Power Builder, X-Windows (X/lib, X/motif, X/Intrinsic), Oracle Developer 2000,VC++, Builder
- **RDBMS(Back End) -** Oracle, Ingres, Sybase, Progress, SQL Plus, Versant, MY SQL, SQL Server, DB2
- **Languages -** C, C++, Java, VC++, C#
- **Scripting Languages -** PERL, SHELL Scripts (Unix), TcL/TK, PHP
- **.NET Platform -** Dialog APL, VB.Net, C#.Net, Visual C#.Net, Net, ASP.Net, Delphi
- **Middle Ware (Component) Technologies -** COM/DCOM, Active-X, EJB, WINCE, MSMQ, BEA, MessageQ, MTS, CICS
- **Unix Internals -** Device Drivers, RPC, Threads, Socket programming
- **Architectural Concepts -** CORBA, TUXEDO, MQ SERIES
- **Internet Technologies -** DHTML, Java script, VB Script, Perl & CGI script, HTML, Java, Active X, RMI, CORBA, SWING, JSP, ASP, XML, EJB, Java Beans, Servlets, Visual Age for JAVA, UML, VRML, WML, Vignette, EDA, Broad vision, Ariba, iPlanet, ATG, Big Talk, CSS, XSL, Oracle ASP server, AWT, J2EE, LDAP, ColdFusion, Haskell 98
- **Wireless Technologies -** Blue Tooth, 3G, ISDN, EDGE
- **Real time Operating System/ Embedded Skills -** QNX, LINUX, OSEK, DSP, VRTX, RTXC, Nucleus
- **Operating Systems -** WINDOWS 2000/ME, WINDOWS NT, WINDOWS XP, UNIX, LINUX, IRIX, SUN SOLARIS, HP/UX, PSOS, VxWorks, AS400, AIX, DOS
- **Application Areas -** Financial/ Insurance/ Manufacturing/ Multimedia/ Computer Graphics/ Instructional Design/ Database Management System/ Internet/ Intranet / Computer Networking-Communication Software development/ E-Commerce/ ERP/ MRP/ TCP-IP programming/ Routing protocols programming/ Socket programming.

NOTE:

i. Projects should not be developed using the packages like Dbase III plus, FoxPro, Visual FoxPro and MS-Access. Also, projects should not be developed using the combination of Visual Basic as the front end and MS-Access as the back end.

Students can also develop applications using tools/languages/software not listed above, if they are part of latest technologies

Phases of Training Period

- At the time of Review – I, students should present Title, Synopsis/Abstract of the project and module description.
- Students should present the Mid Term Report at the time of Review – II.
- Students should present the implementation and testing Report at the time of Review – III
- Students should submit the complete Project Report at the time of Model Viva-Voce.

An external Viva-Voce will be conducted for all the students

Format of Project:

- The whole project report should be nicely composed and presented.
- The dimension of the project report should be in A4 size only.
- Page Specification : (Written paper and source code)
  Left margin - 3.0 cms/1.18 inches
  Right margin- 2.0 cms/0.78 inches
  Top margin 2.54 cms/1 inch
  Bottom margin 2.54 cms/1 inch
- The project report should be typed in good word processor and should avoid spellings and grammatical mistakes.
- The impression on the typed copies should be black in color.
  Normal Body Text: Font Size: 12, Times New Roman, 1.5 lines Spacing, Justified.
  Paragraph Heading Font Size: 14, Times New Roman, Left Aligned. 12 points above & below spacing.

Chapter Heading Font Size: 16, Times New Roman, Centre Aligned, 30 points above and below spacing.

Coding Font size: 10, Courier New, Normal

- Students should use only one side of paper for printing.
- Page numbers - All text pages as well as Program source code listing should be numbered at the bottom center of the page.

Cover Page - Attractive and appealing cover page containing the Project Title, program details, Student & Guide details, month of submission etc.

Color - Cover Page color is Silver Gray

Letter of Authentication - To be submitted by students declaring that the Project Report is the original work of student and no reward had been attained for same project ever before. Students are advised not to **COPY** the project report from other students.

Authorization from Organization where such Project have been implemented with certificate showing the student name, register number and project name.

Certificate from Project Guide - Certificate from the Project Guide certifying the project work done under his/her guidance along with course, student, and project details is complete in all respects.

Draft of Project Report

The size of the project report can be approximately 100 pages, which include the following details:

Certificate of the project guide
Certificate of the Organization
Acknowledgement
Synopsis / Abstract
Table of Contents

1. Introduction

1.1 About Organization
1.2 Problem Definition
1.3 System Configuration
1.3.1 Hardware configuration
1.3.2 Software configuration

2. System Study

2.1 Existing System with limitations

2.2Proposed System with objectives

2.3 Module description

3. System Design & Development

3.1 System Flow Diagrams / Control Flow Diagrams

3.2 E-R Diagrams / Use Case Diagrams

3.3 Data Flow Diagram / Activity Diagrams

3.4 Input Design

3.5 File / Database Design

3.6 Output design (includes Report Design)

3.7 User Interface Design (if Needed)

4. System Testing

Unit Testing

Integration testing

5. System Implementation and Maintenance

System Security Measures

6. Conclusion

Scope for Future Prospects

Bibliography and Web References

Appendices

Forms (input screen shots)

Sample Source Code

Output Screen shots

Reports

- Along with it, if the student feels to add on any other topics as per the demand of the project or want to include the functionalities as per the SDLC (Software Development Life Cycle) or the Software Engineering model used, that can be done and included in the Project Report.

  The project report must include all the components as per the SDLC. It is highly recommended to follow the approaches of Software Engineering methodology

Arrangement of Contents

- Cover Page & Title Page
- Bonafide Certificate from College /Organization
- Synopsis / Abstract
- Table of Contents
- Chapters
- List of Tables
- List of Figures
- List of Symbols, Abbreviations and Nomenclature
- Appendices
- References

The table and figures shall be introduced in the appropriate places.

PREPARATION FORMAT:

- **Cover Page & Title Page** – The Cover page & Title page of the project report should be according to the specification.
- **Bonafide Certificate & Declaration –** The Bonafide Certificate and declaration shall be with double line spacing using Font Style Times New Roman and Font Size 14**.**
- **Abstract –** Abstract should be one page synopsis of the project report typed with double line spacing, Font Style Times New Roman and Font Size 14.
- **Table of Contents –** The table of contents should list all material following it, as well as any material which precedes it. The title page and Bonafide Certificate will not find a place among the items listed in the Table of Contents but the page numbers of which are in lower case Roman letters. One and a half spacing should be adopted for typing the matter under this head. The Table of Content of project should be as specified above.
- **List of Tables –** The list should use exactly the same captions as they appear above the tables in the text. One and a half spacing should be adopted for typing the matter under this head.

- **List of Figures –** The list should use exactly the same captions as they appear below the figures in the text. One and a half spacing should be adopted for typing the matter under this head.
- **List of Symbols, Abbreviations and Nomenclature –** One and a half spacing should be adopted for typing the matter under this head. Standard symbols, abbreviations etc. should be used.
- **Chapters –** The chapters may be broadly divided into 3 parts. Introductory chapter, Chapters developing the main theme of the project work and Conclusion.

  The main text will be divided into several chapters and each chapter may be further divided into several divisions and sub-divisions.

  - ❖ Each chapter should be given an appropriate title.
  - ❖ Tables and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited.

Footnotes should be used sparingly. They should be typed with single space and placed directly underneath in the very same page, which refers to the material they annotate.

- **Appendices –** Appendices are provided to give supplementary information, which is included in the main text as they may serve as a distraction and cloud the central theme.
  - ❖ Appendices should be numbered using Arabic numerals.
  - ❖ Appendices, Tables and References appearing in appendices should be numbered and referred to an appropriate place just as in the case of chapters.
  - ❖ Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.
- **List of References –**The listing of references should be typed 4 spaces below the heading "REFERENCES" in alphabetical order in single spacing and left justified. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details.

  A typical illustrative list given below relates to the citation example quoted above.

REFERENCE BOOKS:

1. *Roger S Pressman,* 2012. **Software Engineering – A Practitioner's Approach**, [Sixth Edition, Fifth Reprint], Tata McGraw-Hill.
2. *Richard Fairley,* 2006. **Software Engineering Concepts**, [Twenty Third Reprint], Tata McGraw Hill.
3. *William.E.Perry,* 2006. **Effective Methods for Software Testing**, [Third Edition], Willey India.

16UNM34J	PART IV:NMEC-I : PC HARDWARE	SEMESTER - III

Total Credits: 2
Hours Per Week: 2

OBJECTIVE:

The subject aims to develop knowledge about:

- Fundamentals of Computer Hardware Components

CONTENTS

UNIT - I

What is PC? - Evolution of PCs - Components of PC - Processor - RAM - Motherboard - Cabinet - Graphic Processors – Hard disk - Network Cards - Cooling Systems - IOT.

UNIT - II

Types of Motherboards - ATX - AT - LPX - BTX - Mini ITX - Hard disk Types - HDD - SDD - IDE - SATA - Cabinet - RAM Types - DDR2 - DDR3 - DDR4.

UNIT - III

Processor - Chipset - Types - Single Core - Multi Core - Cache Memory - Speed Range - AMD and Intel Processor - GPU - Gaming and Production Cards - Types - DDR3 - DDR5.

UNIT - IV

Types of Ports - Network Cards - Sound Cards - Cooling Systems - Liquid and Air Cooling
System.

UNIT - V

Cloud Computing - iOT in Assistive Technologies in Medicine - iOT in Assistive Technologies in Travel.

TEXTBOOKS – eBook

1. *Craig Zacker, John Rourke,* **PC Hardware: The Complete Reference,** 23 Mar 2001
2. *Clements ,* **Principles of Computer Hardware,** 30 Jan 2013

16UNM44J	PART – IV : NMEC -II: PHOTOSHOP AND FLASH	SEMESTER - IV

Total Credits: 2
Hours Per Week: 2

OBJECTIVE:

The subject aims to know the tools regarding:

1. Fundamentals of Adobe Photoshop and Flash

CONTENTS

UNIT - I

Introduction to Photoshop - Selection Tools - Color Theory - Foreground and Background Colors - Creating Shapes.

UNIT - II

Introduction to Web Design - Creating the Single Page - Layer Comps - Slicing - Exporting the Web Page.

UNIT - III

Introduction to Typography - Type Tool - Making Poster - Gradient - Custom Shaped and Selection.

UNIT - IV

Introduction to Adobe Flash - Interface Overview - Key Frames - Web Banners - Creating Button - Tools – Actions.

UNIT - V

Motion Tween - Shape Tween - Classic Tween - Sound Effects - Character Animation - Clickable Actions - Exporting to Different Formats.

TEXT BOOKS:

1. *Andrew Faulkner, Conrad Chavez,"*Adobe Photoshop CC Classroom in a Book", 2015
2. *Russell Chun,* "Adobe Flash Professional CC Classroom in a Book", 2014

16UITSS1	SELF STUDY-1 : ETHICAL HACKING	SEMESTER - I to V

Extra Credits: 1

OBJECTIVES:

The subject aims to develop knowledge about:

1. General computer organization and architecture, Ethical Hacking methodology
2. Generalized exploit techniques ,Basic network concepts

CONTENTS

UNIT - I

Introduction to Ethical Hacking- Hacking History-Ethical Hacking-Threats. TCP/IP Primer- TCP- IP- UDP- Packets- 3 Way Handshake. Foot printing-Gathering Information- Whois-Tracert and TTL.

UNIT - II

Scanning-Ping Sweeps- Scanning Tools- Port Scanning- Enumeration-NetBIOS- Active Directory- SNMP Enumeration- DNS Zone Transfer. Hacking Windows- Privilege Escalation- Cracking Passwords- Data Execution Prevention.

UNIT - III

Hacking Unix- Quest for Root- Vulnerability Mapping- Services. Network Devices and Hardware- Mid-Term- Discovery- Fingerprinting. Hacking Code- Buffer Overflows- Input Validation- Vulnerabilities-Exploits.

UNIT - IV

Web Server Hacking and Web Application Vulnerabilities- IIS Attacks-Apache Attacks- Spidering. Firewalls, Intrusion Detection Systems, and Honey pots- Firewall Types and Configurations- Intrusion Detection Systems (IDS)- Honey pot Applications

UNIT - V

Social Engineering- Social Engineering- Human-Based Social Engineering- Computer-Based Social Engineering- Identity Theft. Viruses, Worms, and Trojans- Viruses- Spyware- Spam bots- Worms.

TEXT BOOK:

1. *Stuart McClure, Joel Scambray, and George Kurtz*, **Hacking Exposed: Network Security Secrets and Solutions,** First Edition Publisher: McGraw-Hill, 2008

16UITSS2	SELF STUDY-2 : GREEN INFORMATION TECHNOLOGY	SEMESTER – I to V

Extra Credits: 1

OBJECTIVE:

The subject aims to develop knowledge about:

- To reduce the energy use, waste, and other environmental impacts of Information Technology (IT) systems

CONTENTS

UNIT - I

The Importance of Green Information Technologies -Governance and Regulatory Issues Minimizing Power Usage – Cooling.

UNIT - II

Business Process Reengineering for Sustainability - Going Paperless - Recycling.

UNIT - III

Sustainable Hardware-Technology Company Case Studies - University and Other Case Studies.

UNIT - IV

Data Center Design and Redesign – Virtualization.

UNIT - V

Managing Your Green IT Transformation - The Future: Staying Green.

TEXT BOOK:

1. *Toby J. Velete, Anthony T. Velete, Robert Elsenpeter* ,**Green IT – Reduce Your Information System's Environmental Impact While Adding to the Bottom Line**, First Edition Publisher: McGraw-Hill, 2008.

24/6/16

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