



SHIVAJI UNIVERSITY, KOLHAPUR

REVISED SYLLABUS AND STRUCTURE THIRD YEAR (C.B.C.S.) BACHELOR OF TECHNOLOGY IN Information Technology

To be introduced from the academic year 2020-21

(w. e. f. June 2020) onwards

	THIRD YEAR INFORMATION TECHNOLOGY - CBCS PATTERN															
	SEMESTER - V															
		TEACHING SCHEME							EXAMINATION SCHEME							
Sr. No.	Course Subject / Title	THEORY			TUTORIAL		PRACTICAL		THEORY				ORAL / PRACTICAL		TERMWORK	
		Credits	No. Of Lectures	Hours	Credits	No. of Hours	Credits	No. of Hours	mode	marks	Total Marks	MIN.	MAX	MIN.	MAX	MIN.
1	PCC-IT501 Operating System-I	3	3	3			1	2	CIE	30	100	40			50	20
									ESE	70						
2	PCC- IT502 Database Engineering	3	3	3			1	2	CIE	30	100	40	25	10	50	20
									ESE	70						
3	PCC- IT503 Computer Algorithms	3	3	3					CIE	30	100	40				
									ESE	70						
4	PCC- IT504 System Programming	4	4	4	1	1			CIE	30	100	40			25	10
									ESE	70						
5	OEC- IT505 Human Computer Interaction OEC- IT506 Internet of Things	3	3	3					CIE	30	100	40				
									ESE	70						
6	PCC- IT507 Application Development Tool I	3	3	3			2	4					50	20	50	20
7	HM-IT508 Soft Skill				1	1							25	10	25	10
	Total (SEM –V)	19	19	19	2	2	4	8			500		100		200	

	THIRD YEAR INFORMATION TECHNOLOGY - CBCS PATTERN															
	SEMESTER – VI															
		TEACHING SCHEME							EXAMINATION SCHEME							
Sr. No.	Course Subject / Title	THEORY			TUTORIAL		PRACTICAL		THEORY				ORAL / PRACTICAL		TERMWORK	
		Credits	No. Of Lectures	No. of Hours	Credits	No. of Hours	Credits	No. of Hours	mode	marks	Total Marks	MIN.	MAX	MIN.	MAX	MIN.
1	PCC-IT601 Computer Graphics	3	3	3			1	2	CIE	30	100	40			25	10
									ESE	70						
2	PCC- IT602 Information Security	4	4	4			1	2	CIE	30	100	40			25	10
									ESE	70						
3	PCC- IT603 Internet Technology	4	4	4			1	2	CIE	30	100	40	50	20	25	10
									ESE	70						
4	PCC- IT604 Operating System II	3	3	3	1	1			CIE	30	100	40			25	10
									ESE	70						
5	OEC- IT605 Cyber Security OEC- IT606 E- Commerce & Digital Marketing	3	3	3					CIE	30	100	40				
									ESE	70						
6	PCC- CS607 Application Development Tool II	2	2	2			1	2					50	20	25	10
7	PW- IT608 Seminar						1	2					50	20	25	10
	Total (SEM –VI)	19	19	19	1	1	5	10			500		150		150	
	Total (SEM - V+ SEM - VI)	38	38	38	3	4	9	18			1000		250		350	

CIE- Continuous Internal Evaluation

ESE – End Semester Examination

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for T.Y. Sem V & VI : 800 + 800 =1600
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for T.Y. Sem V & VI : 50 (SEM-V: 25 + SEM -VI: 25)
• In theory examination there will be a passing based on separate head of passing for examination of CIE and ESE.	
• There shall be separate passing for theory and practical (term work) courses.	

Note:

1. **PCC-IT:** Professional Core Course - Information Technology are compulsory.
2. **HM-IT:** Humanities and Management- Information Technology are compulsory.
3. **PW-CS:** Seminar - Information Technology are compulsory.
4. **OEC-IT: Open Elective Course** – To be offered to Inter departmental students. # - 60% of the students from other branches to be chosen on merit.
 - 40% of the students may be from same branch based on merit.
 - Number of students to be allowed should be 72(Max.) for the branch with intake of 60 students.
 - The above ratio should be followed in proportionate to the sanctioned intake.

OPEN ELECTIVE COURSE-I

Sr. No.	Name of the Subject	Name of the concern Branch
1	i) Human Computer Interaction ii) Internet of Things	Information Technology

OPEN ELECTIVE COURSE-II

Sr. No.	Name of the Subject	Name of the concern Branch
1	iii) Cyber Security iv)E-Commerce & Digital Marketing	Information Technology

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – V
PCC-IT501 – OPERATING SYSTEM-I

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 3 Hrs/Week	Term work: -50 Marks
Tutorial: --	Theory : ESE 70 Marks CIE 30 Marks
Practical: -2 Hrs/Week	Practical :--
Credits:- 4	

Prerequisite:-

- 1) Basic knowledge of digital systems and microprocessors, memory, interrupts is essential.

Course Objectives:

- 1) To introduce Operating systems, types and its use.
- 2) To introduce process, threads and their management.
- 3) To introduce process and Thread scheduling, inter-process synchronization and communication
- 4) To introduce memory management
- 5) To introduce input output devices & their management

Course Outcomes:

At the end of successful completion of course, the students will be able to

1. Write and describe the general architecture of computers
2. Describe, contrast and compare differing structures for operating systems.
3. Construct the operating system for certain hardware modules.
4. Use operating system concepts efficiently at various stages of the software development process.
5. Understand and analyze theory and implementation of processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files.
6. Design, implement and enhance various modules of the operating system to reduce time complexity and space complexity.
7. Compare and construct the various standard solutions to operating system problems

SECTION: I

UNIT I: Introduction to Operating Systems (8)

Introduction to Operating Systems, System structures: What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Operating System operations; Types of Operating Systems, Distributed system; Special-purpose systems; Operating System Services; User - Operating System interface; System calls; Types of system calls; System programs; Operating System structure; Virtual machines; System boot.

UNIT II: Process Management (8)

Process concept; Process scheduling; Operations on processes; Inter-process communication. Multi-Threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues. Process Scheduling: Basic concepts; Scheduling criteria; Scheduling algorithms; Multiple-Processor scheduling; Thread scheduling.

UNIT III: Process Synchronization (7)

Synchronization: The Critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization; Monitors.

SECTION: II

UNIT IV: Deadlocks (6)

System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.

UNIT V: Memory Management (7)

Memory Management Strategies: Background; Swapping; Contiguous memory allocation; Paging; Structure of page table; Segmentation. Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement; Allocation of frames; Thrashing

UNIT VI: IO Systems (4)

Overview, I/O Hardware, Application I/O Interface, Kernel IO Subsystem, Transforming I/O Request to Hardware Operations, Streams.

Text Books :

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne: Operating System Principles, 8th edition, Wiley India, 2009

Reference Books:

1. Operating Systems –Concepts and design –Milan Milenkovic (TMGH)
(For Types of Operating Systems*-Refer Chapter 1 in Operating Systems –Concepts and design
–Milan Milenkovic (TMGH))
2. Operating Systems: Internals and Design Principles (8th Edition)- by William Stallings(Pearson Education International)
3. Modern Operating Systems by Andrew S. Tanenbaum (Pearson Education International)

Term Work:

It should consist of minimum 08-10 assignments/experiments based on above subjects.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – V
PCC-IT502 DATABASE ENGINEERING

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 3 Hrs/Week	Term work: 25
Tutorial: --	Theory: CIE: 30 Marks ESE:70 Marks
Practical: 2 Hrs/Week	POE:50
Credits:- 4	

Prerequisites

1. Basic knowledge of data structures is essential

Course Objectives:

1. To understand the fundamental concepts of database management.
2. To give a systematic database design approach.
3. To understand the basics of transaction processing and concurrency control in database systems.

SECTION: I

UNIT I. Introduction: (6)

Purpose of Database Systems, View of Data, Data Models, Database Users and Administrators, Overall System Design, **Entity Relationship Model**- Basic Concepts, Constraints, Keys, E-R Diagram, Weak Entity Sets, Reducing E-R Diagrams to Tables.

UNIT II. Relational Model: (8)

Structure of Relational Databases, the Relational Algebra, Structured Query Language (SQL), PL/SQL- Stored Procedures, functions, trigger, cursor

UNIT III. Integrity Constraints and Design: (5)

Domain Constraints, Referential Integrity, Functional Dependencies, Closure of set of Functional Dependencies, Canonical cover, Normalization using Functional Dependencies (1NF, 2NF, BCNF, 3NF).

SECTION: II

UNIT IV. File and Index Structure: (7)

Physical storage media, Storage access, File Organization, Organization of Records in Files, Data Dictionary Storage, Indexing and Hashing: Basic Concepts, Ordered Indices, B+ Tree Index Files, B-Tree Index Files, Static Hashing, Dynamic Hashing,

UNIT V. Concurrency Control and Crash Recovery (8)

Transaction concept, Transaction state, Concurrent Executions, Serializability, Recoverability, Testing for Serializability, Lock-Based Protocols, Graph based Protocols, Time- Stamp Based Protocols, Validation based protocols, Failure Classification, Recovery and Atomicity, Log-Based Recovery, Checkpoints.

UNIT VI. Database Security and Authorization: (4)

Access Control, Discretionary Access Control, and Mandatory access control

Text Book:

1. Database System Concept by Henry F. Korth, Abraham Silberschatz, Sudarshan (McGraw Hill Inc.) **Fourth Edition onwards** (UNIT I to 5)
2. Database Management System – RamKrishnan, Gehrke (McGraw Hill Inc.) Third Edition (UNIT VI)

Reference Books:

1. Principles of Database Systems by J.D. Ullman (Galgotia Publications)
2. Database Design by Wiederhold (McGraw Hill Inc.)
3. Fundamentals of Database Systems- Elmasri, Navathe (Benjamin Cummings, 1989).

Term Work:

It should consist of minimum 10 experiments based on above topics and should be implemented as per the note given below.

Set of Experiment is listed below:

1. Study and design of ER diagram
2. Reduction of ER diagrams.
3. Implementation of DDL commands. (Create table with all constraints, Alter table, Drop table).
4. Implementation of DML commands. (Basic SQL structure-select, from, where clause. Other DML clauses like insert, update, delete, in, between, etc.)
5. Implementation of Database joins- (Natural Join, outer joins.)
6. String, Set operations, Order by clause. Queries based on above commands.

7. Implementation of aggregate functions, Group by, has clauses.
8. Study of DCL commands (Grant, Revoke).
9. Creation and use of Views.
10. Introduction to PL/SQL- Stored Procedures, functions, trigger, cursor.
11. Study of Functional dependency, Closure & Canonical Cover. Implementation of closure of Functional dependencies and canonical cover.
12. Study of Normalization & Normal forms
13. Study of B+ index file (creation, traversal, deletion operations).
14. Implementation of static index structure.
15. Simulation of Deferred Log based recovery scheme.
16. Simulation of Immediate Log based recovery scheme.
17. Implementation of database connectivity using JDBC-ODBC

Note:

1. Experiments 1 and 2 and 11 to 12 are for demonstration and understanding of database designing and other concepts.
2. Experiments no. 3 to 10 should be implemented using RDBMS Package.
3. Experiments 14 to 17 are to be implemented using programming language and RDBMS (if required).

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM-V
PCC-IT503 – Computer Algorithms

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 3 Hrs/Week	Term work: --
Tutorial: --	Theory: CIE: 30 Marks ESE:70 Marks
Practical: --	Practical :--
Credits:- 3	

Prerequisites: Data Structures, numerical problem solving methods.

Course Objectives:

1. Analyzing the amortized time complexity of a given algorithm and data structure operations.
2. To introduce to the students the methods of algorithm designs
3. To expose students to various searching and sorting techniques.
4. To familiarize with different design strategies and their analysis.
5. To develop skills to solve real life applications involving algorithm development

Course Outcomes:

Upon successful completion of this course, the student will be able to –

1. Explain different design methods of algorithms.
2. Explain solvability, insolvability of a problem and computational models of parallel algorithms.
3. Apply different design methods of algorithms.
4. Apply different search techniques for efficient graph traversal.
5. Analyze complexity of different algorithm designs.

SECTION: I

UNIT I: Introduction to Algorithms (4)

What is algorithm, Algorithm Specification, Recurrence relations, Performance Analysis? Randomized Algorithms.

UNIT II: Divide and Conquer (6)

Divide and Conquer-The general method, Binary search, finding the maximum and minimum, Merge sort, Quick sort, Selection sort and analysis of these algorithms.

UNIT III: The Greedy method (6)

The general method, Knapsack problem, Job sequencing with deadlines, minimum-cost spanning trees – Prim's and Kruskal's Algorithms, Optimal storage on tapes, Optimal merge patterns, Single source shortest paths.

UNIT IV: Dynamic Programming (6)

The general method, Multistage graphs, All pair shortest paths, Optimal binary search trees, 0/1 knapsack, Reliability design, Traveling Sales person problem.

SECTION: II

UNIT V: Basic Traversal and Search Techniques (6)

Techniques for Binary Trees, Techniques for Graphs – Breadth First Search & Traversal, Depth First Search & Traversal, Connected components and Spanning Trees; Bi-connected components And depth first search.

UNIT VI: Backtracking (5)

The general method, 8-queen problem, sum of subsets, Knapsack Problem, Hamiltonian Cycle, Graph Coloring

NP Hard and NP Complete Problems (3)

Basic Concepts, Introduction to NP Hard Graph Problems.

TEXTBOOK:

1. Fundamentals of Computer Algorithms - Ellis Horowitz, Sartaj Sahani, Sanguthevar Rajasekaran, Universities Press, Second Edition.

References:

1. Introduction to Algorithms - Thomas Cormen, Charles Leiserson, Ronald Rivest, Clifford Stein, PHI, Third Edition
2. Essential Algorithms: A Practical Approach to Computer Algorithms, Rod Stephens, Wiley International.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – V
PCC-IT504 – System programming

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 4 Hrs/Week	Term work: --25 Marks
Tutorial: -- 1 Hrs/Week	Theory: CIE: 30 Marks ESE:70 Marks
Credits:- 5	

Prerequisites: 1. Data structures
2. Assembly language programming
3. Microprocessors

Course Objectives:

1. Design & implement prototypes of language processors
2. Understand lexical, syntax and semantic analysis processes.
3. Understand and define the role of lexical analyzer, use of regular expression and transition diagrams

Course Outcomes:

At the end of successful completion of course, the students should be able to,

1. Identify various language processors.
2. Design & implement prototypes of language processors.
3. Apply language processors tool to create language processors.
4. Understand lexical, syntax and semantic analysis process.
5. Understand and define the role of lexical analyzer, use of regular expression and transition diagrams.
6. Gain experience in the area of designing and implementing software system like language processors (e.g. assembler, linker, loader etc.).
7. Identify the computing feasibility of problems.

SECTION –I

UNIT I: Language Processors: (8)

Introduction, language processing activities, Fundamentals of language processing, Fundamentals of language, Specification, language Processor development tools.

UNIT II: Assemblers: (8)

Elements of assembly language programming, A simple assembly scheme, Pass structure of assemblers, design of a two pass assembler, A single pass assembler for IBM PC.

UNIT III: Macros and Macro Processors: (8)

Macro definition and call, Macro Expansion, Nested macro calls, Advanced macro facilities, Design of macro pre-processor.

SECTION – II

UNIT IV: Compilers and Interpreters: (9)

Input & Lexical Analysis, Context free grammars, top-down parsing, bottom-up parsing, code generation, memory allocation, compilation of expressions, compilation of control structures, code optimization, Interpreters.

UNIT V: Linker and Loader:

(8)

Relocation and linking concepts, design of a linker, Self-relocating programs, A linker for MS DOS, Linking for overlays, Loaders.

UNIT VI: Open Source Software:

(7)

gcc, gdb, ddd, lex and yacc.

TEXTBOOK:

1. Systems Programming: D.M. Dhamdhere, McGraw Hill, 1st Edition

Reference Books:

1. Systems Programming & Operating systems: D.M Dhamdhere, 2nd Edition (TMH)
2. Systems Programming: J.J. Donovan – (TMH)
3. System Programming , Srimanta Pal , Oxford University Press.

Open Source Resources:

1. gcc.gnu.org
2. www.gnu.org/s/gdb/
3. www.gnu.org/software/ddd/

Tutorial work:

It consist minimum of 8-10 tutorials based on above topics.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – V
ELECTIVE I -OEC-IT505 1)Human Computer Interaction
Open Elective Course-I

TEACHING SCHEME	EXAMINATION SCHEME
Lectures:- 3Hrs/Week	ESE:- 70 Marks CIE:- 30 Marks
Tutorial:- --	Term Work:- --
Credit:- 3	Practical/Oral:- --

Pre-requisite:-

1. Knowledge of User Interfaces .
2. Knowledge of programming languages such as C, HTML.

Course Objectives:-

1. To introduce the need for human-computer-interaction study or human-centered software design.
2. To familiarize information, interaction and GUI design process for enhancing user-experience.
3. Develop meaningful user interface.
4. Design and implement useful, usable, and engaging graphical computer interfaces.
5. Design effective HCI for individuals and persons with disabilities.

Course Outcomes:-

At the end of this course, student should be able to:

1. To explain importance of HCI study and principles of user interface.
2. To develop understanding of human factors in HCI design.
3. To design effective user-interfaces.
4. To develop understanding of models, paradigms and context of interactions
5. To understand HCI design processes.
6. To apply cognitive models for predicting human-computer-interactions.

Syllabus:

Unit I : Introduction:

(6)

Importance of user Interface - definition, importance of good design. Benefits of good design. A brief history of Screen design, The graphical user interface - popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user - Interface popularity, characteristics- Principles of user interface.

Unit II: Design process

(6)

Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, and understanding business junctions.

Unit III: Screen Designing

(6)

Design goals - Screen planning and purpose, organizing screen elements, ordering of screen data and content - screen navigation and flow - Visually pleasing composition - amount of information - focus and emphasis - presentation information simply and meaningfully - information retrieval on web - statistical graphics - Technological consideration in interface design.

Unit IV: Windows

(6)

New and Navigation schemes selection of window, selection of devices based and screen based controls. Components - text and messages, Icons and increases - Multimedia, colors, uses problems, choosing colors.

Unit V: Software tools

(6)

Specification methods, interface - Building Tools. Components - text and messages, Icons and increases - Multimedia, colors, uses problems, choosing colors.

Unit VI: Interaction Devices

(6)

Keyboard and function keys - pointing devices - speech recognition digitization and generation - image and video displays -drivers.

TEXT BOOKS:

1. Wilbert O Galitz; The essential guide to user interface design; 2nd Edition; Wiley DreamTech, 2002.
2. Ben Shneidermann; Designing the user interface; 3rd Edition; Pearson Education, 2009.

REFERENCE BOOKS:

1. Alan Dix, et.al; Human - Computer Interaction; 3rd Edition; Pearson Education, 2003.
2. Prece, Rogers and Sharps; Interaction Design; 3rd Edition; Wiley Dreamtech, 2011.
3. Soren Lauesen; User Interface Design; Pearson Education, 2005.
4. D.R.Olsen; Human -Computer Interaction; 1st Edition; Cengage Learning, 2009.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – V
ELECTIVE II - OEC-IT506 2) Internet of Things
Open Elective Course-I

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 3 Hrs/Week	Term work: -
Tutorial: -- 1 Hrs/Week	Theory: 100 Marks
Practical: -	Credits:- 3

Course Objectives:

1. To learn Internet of Things Technology
2. To know the basics of RFID, sensor and GPS technologies
3. To aware students about wireless technologies and IoT applications

Section - I

UNIT I. Introduction (6)

What is the Internet of Things? : History of IoT, About objects/things in the IoT, Overview and motivations, Examples of applications, IoT definitions, IoT Frame work, General observations, ITU-T views, working definitions, Basic nodal capabilities.

UNIT II. Fundamental IoT Mechanisms & Key Technologies : (6)

Identification of IoT objects and services, Structural aspects of the IoT, Environment characteristics, Traffic characteristics ,scalability, Interoperability, Security and Privacy, Open architecture, Key IoT Technologies ,Device Intelligence, Communication capabilities, Mobility support, Device Power, Sensor Technology, RFID technology, Satellite Technology.

UNIT III. Radio Frequency Identification Technology: (6)

Introduction, Principles of RFID, Components of an RFID system, Reader, RFID tags, RFID middleware, Issue.

Wireless Sensor Networks: History and context, node, connecting nodes, networking nodes, securing communication.

Section - II

UNIT IV. Wireless Technologies For IoT : Layer ½ Connectivity : (6)

WPAN Technologies for IoT/M2M, Zigbee /IEEE 802.15.4, Radio Frequency for consumer Electronics (RF4CE), Bluetooth and its low-energy profile , IEEE 802.15.6 WBANS, IEEE 802.15 WPAN TG4j,MBANS,NFC,dedicated short range communication(DSRC) & related protocols. Comparison of WPAN technologies cellular & mobile network technologies for IoT/M2M.

UNIT V. Governance of The Internet Of Things: (6)

Introduction, Notion of governance, aspects of governance, Aspects of governance Bodies subject to governing principles, private organizations, International regulation and supervisor, substantive principles for IoT governance, Legitimacy and inclusion of stakeholders, transparency, accountability. IoT infrastructure governance, robustness, availability, reliability, interoperability, access. Future governance issues, practical implications, legal implications.

UNIT VI. Internet Of Things Application Examples: (6)

Smart Metering, advanced metering infrastructure, e-Health/Body area network, City

automation, automotive applications. Home automation, smart cards, Tracking, Over-The-Air passive surveillance/Ring of steel, Control application examples.

Text Books :

1. Hakima Chaouchi, The Internet of Things, Connecting Objects to the Web, Wiley Publications (for Units 1, 3, 5, 6)
2. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6 The Evolving World of M2M Communications", Wiley Publications (for Units 2,4)

Reference Books :

1. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3842-19156-5, Springer.
2. Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things" Key Applications and Protocols, ISBN 978-1-119-99435-0, Wiley Publications.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – V
PCC-IT507-APPLICATION DEVELOPMENT TOOL – I

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 3 Hrs/Week	Term work: 50 Marks
Tutorial: --	Practical :--50 Marks
Practical: 4 Hrs/Week	
Credits:- 5	

Prerequisites:

- 1) Knowledge of basic C programming, concepts of object orientation.

Course Objectives:

1. To understand differences between C++ and JAVA
2. To understand fundamental concepts like objects, classes, interfaces and polymorphism and its implementation in JAVA
3. To understand robust GUI applications using event handling and Swing with proper exception handling
4. To understand I/O concepts, database connectivity and collections framework in JAVA
5. To Identify classes, objects, members of a class and the relationships among them needed for a specific problem

Course Outcomes:

Upon successful completion of this course, the student will be able to –

1. Understand the structure and model of the Java programming language.
2. Use the Java programming language for various programming technologies.
3. Develop software in the Java programming language.

SECTION: I

UNIT I: Introduction:

(8)

Overview of Java, Java buzzwords, Difference between C++ & Java, Data Types, Arrays, Command line Arguments.

Classes: The Object class, Object Construction, Garbage Collection, Nested & Inner classes, String class, Wrapper classes, Class Design Hints.

Inheritance: Member Access, Super keyword, final keyword, Abstract Classes, Access Protection, Interfaces, Design Hints for Inheritance.

Packages: Defining a package, Searching packages and setting CLASSPATH.

UNIT II: Exceptions:

(8)

Dealing with Errors, Catching Exceptions, Tips for Using Exceptions.

I/O: Streams, Text Input and Output, Reading and Writing Binary data, Multi-Threading: What are threads?, Interrupting threads, Thread states, Thread properties and synchronization.

UNIT III: Swing:

(7)

Introducing AWT and Swing, Creating a Frame, Positioning a Frame, Displaying

SECTION: II

UNIT IV: Generic Programming: (6)

Why Generic Programming? Definition of a Simple Generic Class, Generic Methods.

Collections: Collection Interfaces, Concrete Collections, the Collections Framework.

UNIT V: Database Programming: (4)

Design of JDBC, JDBC Configuration, and Executing SQL statements.

UNIT VI: Deploying Applications and Applets: (3)

JAR Files, Applets.

TEXT BOOK:

1. Core Java- Volume I Fundamentals: Cay Horstmann and Gary Cornell, Pearson, Eight edition
2. Core Java- Volume II Advanced Features: Cay Horstmann and Gary Cornell, Pearson, Eight edition (UNIT II and UNIT V)

Reference Books:

1. JAVA-The Complete Reference: Herbert Schildt, Oracle Press, Mcgraw Hill, Ninth edition
2. A Programmer's guide to JAVA SCJP Certification: Khaleed Mughal and Rolf W. Rasmussen, Addison Wesley, Third edition
3. An introduction to Programming through C++ Abhiram G. Ranade, McGrawHill
4. www.spokentutorial.org, NMEICT Project of MHRD Govt Of India & IIT Bombay.

Guidelines for term work distribution

The distribution of the term work marks is as follows:

1. 25 Marks for performance in practical and experiments
2. 25 Marks for mini-project to be developed in Java.

Guidelines for experiment list

The experiment list should consist of minimum 15 practical assignments on the above topics. Each experiment should be a problem statement which can be solved using some features of Java. Sample experiment list is given below:

- 1) Installation of JDK on Linux.
- 2) Write a program to implement vector class (Understanding basic structure of java programs.)
Write a program to implement matrix class (Understanding basic structure of java programs).
- 4) Write program to implement given inheritance hierarchy (Understanding of inheritance concept).

- 5) Write a program to create linked list through interface. (Understanding of Interface).
- 6) Create a Mymath package that will have following features.
 - a. Trigonometric functions : (sine, cosine, tangent, secant, cosecant and cotangent) that accepts input in degrees instead of radians.
 - b. Performs Statistical operations like min, max, count, sum and average (Understanding of package).
- 7) Write a program to create applet and perform the slideshow of images using Multithreading (Multi-threading).
- 8) Write a program to remove whitespaces from a text file. Name of the file is given using command line (Understanding of basic IO concepts, command line arguments and exception handling).
- 9) Write a program to merge and sort data from different files in a single file. (I/O concepts and exception handling).
- 10) Write a program to copy text from one text box to another on a button click. (Swing and event handling).
- 11) Write a program to create a GUI student registration form. (Swing controls and event handling).
- 12) Write a program to demonstrate key and mouse event handling (Event handling).
- 13) Write a program to demonstrate various methods of ArrayList class. (Collections).
- 14) Write a program to store and retrieve, delete and update Student's information in Database. (Implementation of database connectivity in java).
- 15) Study of frame works like stud, spring hibernates etc.

Guidelines for Mini-project

Three students (Maximum) in a group will carry out a mini project.

A batch of practical should be divided into mini project groups. The faculty should guide the project group for selection of the topic and the work to be done. (Topics preferably data structure algorithm simulation using graphics and thread and other concepts).The mini project should consist of defining the problem, analyzing, designing the solution and implementing it using Java (preferably IDE should be used). The faculty shall monitor the progress periodically. A presentation based on the above work is to be given by the group at the end of the semester. The work will be jointly assessed by a team of faculty from the department. A hard copy of project report, along with a softcopy of the programs is to be submitted to the department.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – V
HM-IT508 Soft Skills

TEACHING SCHEME	EXAMINATION SCHEME
Lecture:- --	Oral Exam : 25 Marks
Practical: --	Term work : 25 Marks
Tutorial: 1 hr/week	
Credit : 1	

Course Objectives:

1. To enable students to acquire and enhance communication and professional skills required for personality development, corporate business and entrepreneurship skills.
2. During the tutorial and practical sessions, it is expected that the contents of all modules should be delivered to the students of different batches and assignments be given based on the activities discussed as per the modules.
3. Evaluation of the term work should be done on a continuous basis and two tests (mid-term and end term tests) should be conducted.
4. Students must demonstrate the acquired skills by means of giving presentations, group discussions, interviews etc.

Course Outcomes:

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

1. Effectively communicate through verbal/oral communication and improve the listening skills
2. Write precise briefs or reports and technical documents .
3. Actively participate in group discussion / meetings / interviews and prepare & deliver presentations .
4. Become a more effective individual through goal/target setting, self motivation and practicing creative thinking.
5. Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.

UNIT I:

Introduction to Soft Skills & Hard Skills, Art of communication, Communication Theory Barriers and Filters, Active Listening, Non Verbal Communication, Feedback and Response Body Language.

UNIT II:

Hidden data of communication, Dealing with feelings, Assertiveness, Self – confidence Emotional Intelligence, Priority Management & Time Management, Psychometric Test.

UNIT III:

World of teams, Team concept, Elements of team work, Formation of a Team based activities.

UNIT IV:

Adapting to corporate life, Corporate Grooming and dressing, Business Etiquette
Business Ethics, Dining Etiquette, Ethics policy.

UNIT V:

Discussions, decisions and presentations, what are group discussions, Types of Group
Discussions, Presentations, Decision making, Interview Skills, Resume Writing.

UNIT VI:

Job Interview: The Gateway to the Job Market, Types of Interviews, Importance of body
language, Need of proper articulation, Probable interview questions, Telephonic or Video
Interview.

Text Books :

1. Soft -skills Manual, Infosys Campus connect Program
2. Personality Development and Soft- Skills ,Barun K. Mitra ,Oxford University Press.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – VI
PCC-IT601 – COMPUTER GRAPHICS

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 3 Hrs/Week	Term work: 25 Marks
Tutorial: --	Theory: ESE: 70 Marks CIE: 30 Marks
Practical: 2 Hrs/Week	Practical:- --
Credits:- 4	

Pre-requisite: Basic knowledge of C language and data structures, geometric constructions.

Course Objectives

1. To provide knowledge to the students about the basics of computer graphics and different display devices.
2. To provide knowledge to the students about 2D and 3D transformations in computer graphics.
3. To make the students aware of generation of curves and surfaces
4. To give students with hands on exposure to Open GL and Animation tools.

Course Outcomes:

Upon successful completion of this course, the student will be able –

1. To express basic ideas of computer graphics and different
2. To demonstrate 2D and 3D transformations.
3. To Implement and understand different types of clipping algorithms used to perform clipping operations on geometric objects.
4. To demonstrate different types of curves in computer graphics.
5. To make use of various multimedia editing tools and software.

SECTION – I

UNIT I. Basic Concepts and Graphics Devices: (4)

Introduction to computer graphics, Applications of computer graphics, Pixel, Frame Buffer, Resolution, aspect ratio. **Video display devices:** CRT (Raster-Scan and Random-Scan displays), Flat-Panel Displays. **Input devices:** Keyboards, Mouse, Joysticks, Digitizers, Touch Panels and Light Pens. **Hard-Copy Devices:** Printers

UNIT II: Geometric Transformations and Multimedia: (8)

Basic 2D & 3D transformations - Translation, Scaling, Rotation, Reflection, Shearing, Multiple Transformations, Definitions -Where to use Multimedia, Uses of multimedia :Multimedia in Business, Multimedia in Schools, Multimedia in Home, Multimedia in Public Places, Virtual Reality

UNIT III: Windowing and Clipping: (8)

The Viewing Pipeline, Window-to-Viewport Coordinate Transformation, Clipping Operations,

Point Clipping, **Line Clipping:** Cohen –Sutherland, **Polygon clipping:** Sutherland- Hodgeman.
Filled-Area Primitives: Scan-Line Polygon Fill Algorithm, Inside-Outside Tests, Boundary-Fill Algorithm, Flood-Fill Algorithm.

SECTION – II

UNIT IV: Curves and Surfaces:

(6)

Curve Representation, Non-parametric and parametric curves, representation of space curves, Cubic Spline, Parabolic Blended curves, Bezier curves and B-spline curves, Z- buffer, Warnock algorithm.

UNIT V: Introduction to OpenGL & GLUT Libraries:

(5)

Introduction to OpenGL, OpenGL basic graphics primitives: The OpenGL data types, OpenGL state, establishing the coordinate systems, Line drawing in OpenGL, drawing poly-lines and polygons, Design & use of GLUT & GLUI menus.

UNIT VI: Computer Animation:

(5)

Introduction, Key frame animation, Construction of an animation sequence, Motion control Methods, Procedural animation, Key-frame animation vs. Procedural animation, Introduction to Morphing, Wrapping techniques, Three dimensional morphing.

TERM WORK

It should consist of minimum of 8-10 experiments based on the following topics: -

- 1) Installation of computer graphics devices and adapters.
- 2) Drawing of different Geometric objects by using C/CPP programs
- 3) Implementation of Bresenham's line and circle drawing algorithms
- 4) Implementation of 2D Transformations
- 5) Implementation of 3D Transformations
- 6) Implementation of clipping algorithm
- 7) Implementation of filling algorithms
- 8) Implementation of Bezier curves
- 9) Implementation of B-Spline curves
- 10) Construction of simple pictures by drawing line, polylines, polygons using OpenGL.
- 11) Animations using Blender 3-D software.

TEXT BOOKS:

1. Mathematical elements for Computer Graphics - David F. Rogers, J. Alan Adams (MGH Int.) (For UNITs 1, 4)
2. Procedural elements for Computer Graphics - David F. Rogers (MGH International) (For UNITs 2, 3)

3. Computer Graphics- Rajesh Maurya (WILEY India) (For UNIT VI)
4. Computer Graphics C Version second edition –Donald D. Hearn, M. Pauline Baker (Pearson) (For UNIT I, 2, 3, 4, 6).

REFERENCE BOOKS:

1. Principles of Computer Graphics Theory and Practice Using OpenGL and Maya, Saline Govil-Pai, (Springer).
2. Computer Graphics (second Edition) - Zhigang Xiang & Roy Plastock (Schaum's Outline Series, TMGH).
3. Computer Graphics Using OpenGL F.S. Hill Jr. Stephen M. Kelley, (Pearson Education).

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM– VI
PCC-IT602 – INFORMATION SECURITY

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 4 Hrs/Week	Term work: --25 Marks
Tutorial: --	Theory : ESE 70 Marks CIE 30 Marks
Practical: 2 Hrs/Week	Practical :--
Credits:- 5	

Prerequisites: Basic knowledge of Computer Networks, OSI layer, TCP/IP model.

Course Objectives:

1. To understand the basics of cryptography, how it has evolved, and some key encryption techniques.
2. To understand principal concepts, major issues, technologies, and basic approaches in information security.
3. To learn security policies such as authentication, integrity and confidentiality.
To understand major information security threats and countermeasures.

Course Outcomes:

At the end of successful completion of course, the students will be able to

1. Design, implement and enhance security modules for software
2. Architect the security system for certain hardware modules
3. Understand ethical issues of usage of intern security
4. Compare and contrast the various standard solutions to the security problems
5. Utilize security system concept efficiently at software development process

SECTION: I

UNIT I: Overview and Classical Encryption Techniques

Overview: (3)

Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Network Security

Classical Encryption Techniques: (3)

Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines

UNIT II: Block Ciphers and the Data Encryption Standard (5)

Block Cipher Principles, The Data Encryption Standard (DES), A DES Example, The Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles

UNIT III: Public Key Cryptography (4)

Principles of Public-Key Cryptosystems, The RSA Algorithm, Diffie-Hellman Key Exchange, ElGamal Cryptosystem

SECTION: II

UNIT IV: Cryptographic Data Integrity Algorithms

Cryptographic Hash Functions: (5)

Applications of Cryptographic Hash Functions, Two Simple Hash Functions, Requirements and Security, Hash Functions Based on Cipher Block Chaining, Secure Hash Algorithm (SHA), SHA-3

Message Authentication Codes: (4)

Message Authentication Requirements, Message Authentication Functions, Message Authentication Codes and Security of MACs, MACs Based on Hash Functions: MAC, MACs Based on Block Ciphers: DAA and CMAC

Digital Signatures: (3)

Digital Signatures, ElGamal Digital Signature Scheme, Schnorr Digital Signature Scheme, Digital Signature Standard (DSS)

UNIT V: Key Management and Distribution (5)

Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key Distribution Using Asymmetric Encryption, Distribution of Public Keys, X.509 Certificates, Public Key Infrastructure

UNIT VI: Network And Internet Security

Transport-Level Security (4)

Web Security Issues, Secure Sockets Layer (SSL), Transport Layer Security (TLS), HTTPS

Electronic Mail Security (3)

Pretty Good Privacy (PGP), S/MIME

IP Security (3)

IP Security Overview, IP Security Policy, Encapsulating Security Payload

Text Book:

1. Williams Stallings – Cryptography and Network security principles and practices. Pearson Education (LPE), Fifth Edition
2. Cyber Security, Nina Godbole , Wiley Publications.
3. Cryptography & Network Security B.A. Forouzan McGrawHill.

Reference Books:

1. Cryptography and network security – Atul Kahate (TMGH)
2. Handbook of Applied Cryptography - Menezes, A. J., P. C. Van Oorschot, and S. A. Vanstone

Term work:

- Minimum of 10 Experiments to be performed from the list given below.

- Implementation can be in C/C++ Programming Language
- Practical should include the implementation and use of the following mechanisms/Algorithms/Tools /Techniques

Experiment List

1. GCD Using Euclidean algorithm/Computing Multiplicative inverses/ Prime number and modular arithmetic operations.
2. Substitution/Transposition/ Product Cipher and their Analysis
3. Single round of DES algorithm/Double DES/ Triple DES and its analysis
4. RSA Algorithm to provide Confidentiality and Authentication services or any other Public-Key Algorithm.
5. Diffie–Hellman or any other key exchange Algorithm.
6. Implementation and use of any authentication functions / algorithm.
7. Generation and use of Digital Signature for real world situation.
8. Usage of PGP security package and S/MIME features.
9. Experimenting with SSL/TLS/E-Commerce Applications and identifying their Vulnerabilities.
10. Experimentation on identifying non-cryptographic Protocol Vulnerabilities and remedies thereon.
11. Experimenting on identifying software Vulnerabilities using various tools/techniques and their analysis.
12. Any other4 Implementation/Demo/Experimentation based on the topics of syllabus.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – VI
PCC-IT603 – Internet Technology

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 4 Hrs/Week	Term work: --25 Marks
Tutorial: --	CIE: 30 Marks ESE:70 Marks
Practical: --2 Hrs/Week	Practical :--50
Credits:- 5	

Prerequisites: Knowledge of Computer Networks.

Course Objectives:

1. To make students able to identify and understand client-server model and implement it using Java Socket programming
2. To use and analyze various Protocols using Protocol analyzing tools like wireshark and tcpdump.
3. To introduce students with emerging protocols IPv6 and the ICMPv6 and write applications to communicate using IPv6
4. To make students familiar with architecture of WWW
5. To understand working of email system and write an application to send and receive e-mail
6. To identify various protocols related multimedia over Internet

Course Outcomes:

Upon successful completion of this course, the student will be able to –

1. Program the client server model using sockets
2. Understand and apply next generation protocol and addressing model
3. Elaborate the fundamentals of Domain Name Systems
4. Apply the concepts of Remote login and FTP in network applications
5. Learn fundamentals of web, HTTP and e-mail communication protocols.
6. Understand multimedia streaming and relevant protocols.

SECTION: I

UNIT I: Client-Server paradigm, Socket Interfaces, Protocol analyzing (8)

The client-server model and software design, concurrent processing in client-server software, algorithms and issues in client-server design, multi-protocol servers, multi-service servers, concurrency in clients, Unix Internet Super Server (inetd).The Socket Interface, Socket Java API: connection oriented- Socket and ServerSocket. Connectionless- DatagramSocket and DatagramPacket. Utility classes- URL, URLConnection, InetAddress, and InterfaceAddress. tcpdump, wireshark.

UNIT II: Next GenerationIPv6 and ICMPv6 (6)

IPv6 addressing, IPv6 Packet format, Transition from IPv4 to IPv6, ICMPv6

UNIT III: DHCP, DNS, TELNET and SSH (8)

DHCP: Introduction, Previous Protocols, DHCP operation, Packet Format, DHCP Configuration.

DNS: Need, Name Space, Domain Name Space, Distribution of name space, and DNS in the internet, Resolution, DNS messages, Types of records, Compression examples, encapsulation.

TELNET and SSH: Concept, NVT, Embedding, Options & options/sub-option negotiation, controlling the server, Out-of-band signaling, Escape character, Mode of operation, user interface, security issue in telnet, **SSH**, format of SSH packets.

SECTION: II

UNIT IV: FTP, TFTP and HTTP (6)

FTP: Connections, Communication, Command processing, File transfer, User interface, Anonymous FTP, **TFTP.** **HTTP:** Architecture, Web Documents, HTTP Transaction, Request & Response messages: header & examples, Persistent vs. non persistent HTTP, Proxy Servers.

UNIT V: Electronic Mail and SNMP (6)

Architecture, User agents, addresses, delayed delivery, Aliases, Mail transfer agent SMTP commands & responses, mail transfer phases, MIME, Mail Delivery, mail access protocols, SNMP.

UNIT VI: Multimedia in Internet (6)

Streaming stored audio/video, streaming live audio/video, real-time interactive audio/video, real-time transport protocol (RTP), real-time transport

TEXTBOOK:

1. TCP/IP Protocol Suite Edition 4 by Behrouz Forouzan (McGraw Hill)

Reference Books:

1. Internet and Web Technologies ,Raj Kamal McGraw Hill
2. <http://docs.oracle.com/javase/7/docs/api/java/net/package-summary.html>
3. <http://nmap.org/ncat/guide/>

Lab work:

It should consist of 10 to 12 assignments to be implemented in JAVA (preferably on Linux).

Following is the minimum list of practical problems.

1. Client program using TCP and UDP to connect to well-known services. (ECHO, TIME OFDAY, FINGER, TIME, etc)
2. Study of tcpdump and wireshark.

3. Iterative UDP client-server application. Server should keep a log of client requests.
4. Concurrent TCP client-server application. Server should keep a log of client requests.
5. Client-Server application using IPv6.
6. Study of DNS client utilities and implementation of nslookup/host.
7. Implement file transfer protocol using FTP messages.
8. Implement a simple web server. Use the browser as a client for your server.
9. Send/receive mail using SMTP/POP3 (IMAP) commands.
10. Develop personal website using database connectivity.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – VI
PCC-IT 604 -OPERATING SYSTEM-II

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 3 Hrs/Week	Term work: --25 Marks
Tutorial: --	Theory: CIE: 30 Marks ESE:70 Marks
Practical: --2 Hrs/Week	Practical :--
Credits:- 4	

Prerequisites: Basic fundamental knowledge of Operating Systems.

Course Objectives:

- 1) To understand fundamental concepts of the Unix System.
- 2) To understand the File system and system calls
- 3) To study structure of process
- 4) To study Process control and scheduling
- 5) To study Memory management and I/O subsystem

SECTION: I

UNIT I: Overview of the UNIX System

(7)

System structure, user perspective, Operating System services, assumption about H/W. Architecture of UNIX operating system, introduction to system concepts, kernel data structure, system administration

UNIT II: The Buffer Cache

(5)

Buffer headers, structure of the buffer pool, scenarios for retrieval of a buffer, reading and writing disk blocks, advantages and disadvantages of cache

UNIT III: Internal Representation of Files

(13)

Inodes, structure of the regular file, directories, conversion of a pathname to inode, super block, inode assignment to a new file, allocation of disk blocks, other file types System Calls for the File System Open, Read, Write, Close, File Creation, and Creation of special files, change directory and change Root, Pipes, Mounting and Unmounting File Systems, Link,Unlink

SECTION: II

UNIT IV: The Structure of process

(5)

Process stages and transitions, layout of system memory, the context of a process, saving Context of a process, manipulation of the process address space

UNIT V: Process Control

(4)

Process creation, signals, process termination, awaiting process termination, invoking other programs, the user id of a process, the shell, system Boot and the Init process.

UNIT VI: Scheduling:

(3)

Process Scheduling, system call for time, clock

UNIT VI: Memory Management and I/O Subsystem

(3)

Swapping, Demand paging, A Hybrid system with swapping and demand paging, Driver Interfaces, Disk Drivers, Streams

Text Book:

1. The design of Unix Operating System - Maurice J. Bach (PHI) Second edition

Term Work:

It should consist of 10 experiments of implementation based on UNIX/LINUX operating system.

Proposed List of Experiment:

- 1) Study of Unix Operating System
- 2) Study & Implementation of General Utilities, Directory & File Utilities
- 3) Study & Implementation of pipes
- 4) Implementation of Scheduling Algorithms.
- 5) Study & Implementation of process related utilities
- 6) Study & implementation of Shell programming
- 7) Study of system start-up & init
- 8) Semaphore implementation
- 9) Implementation of IPC using message
- 10) Implementation of IPC using shared memory
- 11) Memory allocation algorithm (best-fit, first-fit, worst-fit)

T. Y. B. Tech (Information Technology) SEM – VI

ELECTIVE II OEC - IT605 1)Cyber Security

Open Elective Course - II

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	Theory : ESE 70 Marks CIE 30 Marks
Tutorial : -----	Term work : -----
Credit:-3	Practical : -----

Prerequisite: Fundamental knowledge of Data Communication, Networking and Information Security.

Course Objectives:

1. To gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks
2. To examine secure software development practice
3. To understand key terms and concepts in I.T. ACT
4. To incorporate approaches for incident analysis and response

Course Outcomes:

On completion of the course, student will be able to

1. Explain the cyber security concepts.
2. Describe the cyber security vulnerabilities and prevention techniques.
3. Explain the different rules and regulations under I.T. ACT.
4. Explain the concepts of digital forensics & incident management

UNIT I. Computer and Network Security

(6)

Introduction to Computer Security - Introduction, How Seriously Should You Take Threats to Network Security? Identifying Types of Threats, Basic Security Terminology, Concepts and Approaches, Online Security Resources Networks and the Internet
Introduction, Network Basics, How the Internet Works, Basic Network Utilities, Advanced Network Communications Topics

UNIT II. Cyber Frauds, DoS, Viruses:

(6)

Cyber Stalking, Fraud, and Abuse: Introduction, How Internet Fraud Works, Identity Theft, Cyber Stalking, Protecting Yourself Against Cyber Crime. Denial of Service Attacks: Introduction, DoS, Illustrating an Attack, Malware: Introduction, Viruses, Trojan Horses, The Buffer-Overflow Attack. The Sasser Virus/Buffer Overflow, Spyware, Other Forms of Malware, Detecting and Eliminating Viruses and Spyware

UNIT III. Techniques Used by Hackers: (6)

Introduction, Basic Terminology, The Reconnaissance Phase, Actual Attacks, Malware Creation, Penetration Testing

UNIT IV. Computer Security Technology: (6)

Introduction, Virus Scanners, Firewalls, Antispyware, IDS, Digital Certificates, SSL/TLS, Virtual Private Networks, Wi-Fi Security

UNIT V. I.T. ACT: (6)

Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, I.T. Act

UNIT VI. Introduction to Forensics: (6)

Introduction, General Guidelines, Finding Evidence on the PC, Finding Evidence in System Logs, Getting Back Deleted Files, Operating System Utilities, Operating System Utilities, Mobile Forensics: Cell Phone Concepts

Text Books:

1. Computer Security Fundamentals - Chuck Easttom, Pearson, third edition.

Reference Books:

1. Jason Luttgens, Matthew Pepe, Kevin Mandia, Incident Response & Computer Forensics, McGraw-Hill Osborne Media, 3rd edition, 2014.
2. Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Real Digital Forensics: Computer Security and Incident Response, Paperback – Import, 2005.
3. John Sammons, the Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics Paperback, February 24, 2012.
4. Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray and George Kurtz, McGraw-Hill, 2005.
5. Ethical Hacking, Thomas Mathew, OSB Publisher, 2003.
7. Dave Shackleford, Virtualization Security: Protecting Virtualized Environments, John Wiley & Sons, 2012.
8. BRAGG, Network Security: The Complete Reference, McGraw Hill Professional, 2012

T. Y. B. Tech (Information Technology) SEM –VI
ELECTIVE II OEC - IT606 2) E- Commerce & Digital Marketing
Open Elective Course – II

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	Theory : ESE 70 Marks CIE 30 Marks
Tutorial : -----	Term work : -----
Credit:-3	Practical : -----

Course Objectives:

1. To get the knowledge about business advantages of the e-commerce and digital marketing and its importance
2. To develop a digital marketing plan and to make SWOT analysis
3. To get introduced with various digital channels, business tools in social networking
4. To understand the optimization of a Web site and SEO optimization

Course Outcomes:

1. Students will be able to identify the importance of the e-commerce and digital marketing for business success
2. Students will be able to create a digital marketing plan, starting from the SWOT analysis and defining a target group
3. Students will be able to identifying digital channels, business tools used in social networking
4. Students will be able to demonstrate the optimization of web site using business tools.

UNIT I. Introduction to E-commerce, frameworks & architectures (4)

Introduction: The term “E-Commerce”, Business models related to E-Commerce, Technical and economic challenges

Frameworks and architectures: Actors and stakeholders, Fundamental sales process, Technological elements

UNIT II. B2C business, B2B business (5)

B2C Business: The process model and its variants, The pricing challenge, The fulfillment challenge, The payment challenge, B2C- business and CRM, B2C software systems

UNIT III. Introduction to Digital Marketing

(6)

How digital technologies transformed marketing?, Definitions- digital marketing and multichannel marketing- Paid, owned and earned media, the growing range of digital marketing platform, digital marketing strategy-key features of digital marketing strategy, applications of digital marketing, benefits of digital marketing, alternative digital business models, difference between e-commerce and e-business, challenges in developing and managing digital marketing strategy

UNIT IV. Online marketplace analysis & macro environment

(8)

Introduction: situation analysis for digital marketing, the digital marketing environment, understanding customer journeys, online consumer behavior and implications for marketing, business models for e-commerce

Online macro environment: Technological forces, economic forces, political forces, Legal forces, social forces and cultural forces

UNIT V. Digital Marketing Strategy and relationship marketing

(6)

Digital Marketing strategy development: how to structure digital marketing strategy, strategy implementation

Relationship marketing using digital platforms: Introduction, the challenge of customer engagement, customer lifecycle management

UNIT VI. Marketing Communications

(7)

Marketing Communications using digital media channels: Introduction, search engine marketing, online public relations, e- mail marketing and mobile text messaging, social media and viral marketing, offline promotion techniques.

Case study: How the ministry of food processing took to social media or world food India 2017.

Text Books:

1. Introduction to E-commerce: Combining Business & Information Technology 1st Edition, (2016) Martin Kutz. & bookboon.com
2. Digital Marketing: Strategy, Implementation and Practice, 6th Edition by Dave Chaffey, Fiona Ellis-Chadwick, Pearson Education.

Reference Books:

1. The Beginner's Guide to Digital Marketing
(2015). Digital Marketer. Pulizzi, J.(2014) Epic

2. “Electronic Commerce”, Jeffrey F Rayport and Bharat Bhasker, Tata McGraw Hill.

It should consist of assignments on following topics within group of 4-5 students & its

evaluation will be considered for CIE

1. Define a target group (working in groups)
2. Creating web sites, MS Expression (working in groups)
3. Writing the SEO content (working in groups)
4. Google AdWords (working in groups)
5. CRM strategy (working in groups)

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – VI
PCC-IT607-APPLICATION DEVELOPMENT TOOL – II

TEACHING SCHEME	EXAMINATION SCHEME
Theory: 2 Hrs/Week	Term work: --25 Marks
Tutorial: --	Practical :--50 Marks
Practical: --2 Hrs/Week	Credits:- 3

Prerequisites: Basic knowledge of Object Oriented Programming

Course Objectives:

1. To understand fundamentals of .NET framework.
2. To understand fundamental concepts like objects, classes, interfaces, polymorphism, delegates and events and its implementation in C#.
3. To understand robust GUI applications using event handling and Windows form controls with proper exception handling.
4. To understand I/O concepts, database connectivity using ADO.NET and collections and generics in C#
5. To analyze problems and devise suitable solution using C#.NET features

Course Outcomes:

Upon successful completion of this course, the student will be able to –

1. Understand the structure and model of the programming language C #
2. Develop, implement Applications with C#.

SECTION: I

UNIT I: Introduction to .net: (4)

Evolution of .net, Benefits of .net, CLR, CTS, MSIL, JIT, BCL, metadata and assemblies in detail, GAC and strong name assemblies, Security Manager.

UNIT II: C# fundamentals: (3)

Data types - Value types, Reference types, boxing and unboxing, Arrays, Pass by value and by reference and out parameters, params parameter.

Namespaces, classes, objects, structs: definition and creation.

UNIT III: Delegates and Events: (8)

Creating and using delegates, multicasting with delegates, event sources, event handlers

GUI Programming: Introduction to GUI Application and their components, Windows forms – buttons, check boxes, radio buttons, panels, group boxes, list boxes, picture

SECTION: II

UNIT IV: (4)

File handling: The abstract stream class, working with StreamWriters and StreamReaders, Working with StringWriters and StringReaders, Working with BinaryWriters and BinaryReaders.

UNIT V: ADO.NET: (4)

Exploring ADO.net Entity framework, Connected and disconnected architecture, data access with ADO.net.

UNIT VI: Collection and Generic: (3)

Collection classes in .net, Understanding Generics, generic collection classes in .net.

Text Book

1. C# 4.0 The Complete Reference: Herbert Schildt, McGraw Hill.

Reference Books:

- 1 Microsoft Visual C# 2010 Step by Step: John sharp, Microsoft Press
- 2 .NET 4.5 Programming (6 – in -1) Black Book – Kogent – Dreamtech Press
- 3 CLR via C# :Jeffrey Richter, Microsoft Press, 3rd edition
- 4 ASP.Net 4.5 Black Book ,Dreamtech ,Wiley International.

Guidelines for term work distribution

The distribution of the term work Marks is as follows

1. 25 Marks for performance in practical and experiments

Guidelines for experiment list

The experiment list should consist of minimum 12 practical assignments on the above topics. Each experiment should be a problem statement which can be solved using some features of .Net and C#. Sample Experiment List is given below:

- 1) Introduction to .Net framework & implementation of simple console application.
- 2) Study and implementation of different types of Constructors in C#.
- 3) Write a program to study use of Properties in C#.
- 4) Write a program to implement inheritance concepts.
- 5) Program to implement Different types of Delegates.
- 6) Program to demonstrate the events handler in C#.
- 7) Study of Collections and Generics and create a simple shopping cart Application that can be sorted by the price of the items using ArrayList.
- 8) Study of window-based application.
- 9) Program to study various controls for windows form application.
- 10) Create a small registration form layout using Windows Form Applications.

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- 11) Demonstrate the Menu controls and Different Dialog controls in windows form application.
- 12) Study and Implementation of File Handling.
- 13) Program to display the account details with help of ADO.Net and windows form application.
- 14) Demonstrating dataset, data adapter and grid views in disconnected data access layer of ADO.NET.
- 15) Introduction to Visual web development application with ASP.NET.

T. Y. B. TECH (INFORMATION TECHNOLOGY) SEM – VI
PCC-IT608 – SEMINAR

TEACHING SCHEME	EXAMINATION SCHEME
Theory: --	Term work: 25 Marks
Tutorial: --	Practical/Oral: -- 50 Marks
Practical: --2 hrs/Week	Credit :-1

Students should deliver seminar individually. It should consist of a talk of 30-45 minutes on a topic preferably from the area in which a student intends to work for his Project in B.E Semester – VII and Semester – VIII or any upcoming technology not covered in syllabus.

Term Work assessment:

The seminar to be delivered by students should be assessed by a panel of at least two faculties within the department.

The assessment for the seminar should include but not limited to following points.

- 1) Novelty of the topic
- 2) Technical depth
- 3) Organization of the topic
- 4) Presentation skills
- 5) Communication skills
- 6) Answering Questions raised by faculties

The seminar report there-on is to be submitted which is to be internally assessed for 25 Marks.

External oral exam:

The external oral examination will be conducted by the examiners appointed by the University