



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited A++ Grade by NAAC | 12B Status by UGC | Approved by AICTE

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School of Science and Humanities Department of Computer Science

1.1.3 Courses having focus on Employability / Entrepreneurship / Skill Development

Programme:

S. No.	Course Code	Course Name	Page No.
Employability			
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 Employabil

 Entrepreneurs

 Skill

Entrepreneurship			
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Skill Development			
1	SBSB1101	PROBLEM SOLVING TECHNIQUES WITH C	3
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SBSB1101	PROBLEMSOLVING TECHNIQUES WITH C	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To learn the fundamental of PST and methodologies which are essential to building good C program.
- To demonstrate a thorough understanding of modular programming by designing programs which require the use of programmer - defined functions.
- To demonstrate Structures, pointers and file processing in C

UNIT1 INTRODUCTION TO COMPUTER PROBLEMSOLVING

9Hrs.

Algorithms - Building blocks of algorithms (statements, control flow, functions)-Notation (pseudo code, flow chart) - Algorithmic problem solving for socio economic conditions in global perspectives- Simple strategies for developing algorithms (iteration, recursion)- Efficiency of algorithms.

UNIT2 BASICS OF C PROGRAMMING

9Hrs.

Introduction to C: Features of C - Structure of C Program-Data Types- 'C' Tokens-Input/output statements-Control Statement, Functions: - Types of Functions -Recursion. Algorithms: Reversing the digits of a number - Generation of Fibonacci sequence- Factorial Computation.

UNIT3 ARRAYS AND STRINGS

9Hrs.

Arrays: Single and Multidimensional Arrays-- Array as Function Arguments, Strings: Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen, Arithmetic Operations on Characters, String-handling Functions, Example Programs (with and without using built-in string functions).

UNIT4 STRUCTURES

9Hrs.

Structure: Nested Structures - Array of Structures - Structure as Function Argument-Function that Returns Structure, Union. Algorithms: Sum of array elements- Removal of duplicates from an array- Finding the Kth smallest element.

UNIT5 POINTERS AND FILE PROCESSING

9Hrs.

Pointers: Introduction, Arrays Using Pointers - Structures Using Pointers - Functions Using Pointer, Dynamic Memory Allocation, Storage Classes, File Handling in 'C'. Algorithms: Swap elements using Call by Reference - Sorting Arrays using pointers- Finding sum of array elements using Dynamic Memory Allocation.

Max. 45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1-Develop solutions for the given problem.

CO2-Understand and design solutions for a problem

CO3-Able to understand variables, tokens and keywords in C

CO4-Design and Implement applications using memory allocation, arrays and string

CO5-Understand and design program using structures and unions

CO6-Demonstrate file processing functions in C

TEXT/REFERENCEBOOKS

1. Dromey.R.G, "HowtoSolveitbyComputer", Prentice-HallofIndia, 8thIndianReprint, 2008.
2. Aho.A.V., Hopcroft.J.E and Ullman.J.D, "The Design and Analysis of Computer Algorithms", Pearson education, 2004. Deitel and Deitel, C how to Program, 7th Eition, Pearson Education, 2013.
3. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Pearson Education, 2015.
4. Yashavant Kanetkar, Understanding Pointers in C, 4th Revised& Updated Edition, Bbp Publications, 2008.

ENDSEMESTEREXAMQUESTIONPAPERPATTERN

Max.Marks:100

ExamDuration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PARTB:2 Questions from each unit of internal choice, each carrying16marks

80Marks

SBSB1102	FUNDAMENTALS OF COMPUTER TECHNOLOGY	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To understand the basic of computer and working with OS.
- To learn about internet, its types and its applications.
- To understand basics of communication and networks.

UNIT1 INTRODUCTION TO COMPUTERS

9Hrs.

Definition-Characteristics of a computer-Classification of Computers- Basic Anatomy of the Computer- Applications/Uses of Computers in different fields.

UNIT2 INPUT AND OUTPUT DEVICES

9Hrs.

Input devices-Output devices-Data Representation-Programming Languages/Computer Languages-Software: System software-Application software.

UNIT3 DATA COMMUNICATION AND COMPUTER NETWORKS

9Hrs.

Data Communication-Computer Network-The Uses of a Network-Types of Networks-Network Topologies-Transmission Media: Guided Transmission Media- Wireless Transmission.

UNIT4 INTERNET AND ITS APPLICATIONS

9Hrs.

History of Internet- Uses of Internet- Advantages of Internet - ISP - Internet Services - IP Address - Web Browser - URL - DNS - Internet Explorer - Types of Internet Connections - E-mail - Search Engine.

UNIT5 OPERATING SYSTEM

9Hrs.

Evolution of Operating Systems-Function of Operating System-Classification of Operating system-Example of Operating System- DOS- Windows-UNIX- Linux.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1-Converse in basic computer terminology

CO2-Apply algorithmic reasoning to a variety of computational problems

CO3-Solve basic computation problems

CO4-Formulate opinions about the impact of computers in society

CO5-Possess the knowledge of basic hardware peripherals

CO6-Describe the use of internet and its applications

TEXT/REFERENCE BOOKS

1. Alex Leon and Methews Leon "Fundamentals of information Technology" Vikas Publishing House Pvt.Ltd.
2. Introduction to Information Technology, P.Rizwan Ahmed, Second Edition, Margham Publications, 2016.
3. Introduction to Information Technology, Pelin Aksoy, Leura De Nardis, Cengage Learning India Pvt.Ltd.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PART B:2 Questions from each unit of internal choice, each carrying 16marks

80Marks

SBSB1201	DATABASE MANAGEMENTSYSTEM	L	T	P	EL	C	Total Marks
		3	0	0	0	3	100

COURSEOBJECTIVES

- To gain knowledge in fundamentals of data models using ER diagram.
- To make a study of SQL and relational database design.
- To understand about Query processing, optimization, and Concurrency control technique

UNIT1

9Hrs.

Basic Concepts: Database and Database users- Database system concepts and architecture- Data modeling using Entity Relationship model- Enhanced entity relationship and object modeling- Record storage and file organizations - Index Structures for files

UNIT2

9Hrs.

Relational Model, Languages and Systems: The Relational Data Model, Relational Constraints, and the relational Algebra - SQL - The Relational Database Standard - ER and EER to Relational Mapping and Other Relational Languages - Examples of Relational Database Management Systems: Oracle and Microsoft Access.

UNIT3

9Hrs.

Database Design, Theory and Methodology: Functional dependencies and normalization for relational database - Relational database design algorithms and further dependencies - Practical database design and tuning.

UNIT4

9Hrs.

System Implementation Techniques: Database system architectures and the system catalog- Query processing and optimization.

UNIT5

9Hrs.

Transaction processing concepts - Concurrencycontrol techniques- Database recovery techniques- Database securityand Authorization. Introduction to Emerging Database Technologies and Application

Max.45Hrs.

COURSEOUTCOMES

On completion of the course, student will be able to

CO1-Design ER- model store presents implement database application scenarios

CO2-Ability to understand and design data modelling using Entity-Relationship model

CO3-Implement SQL to abroad range of query and data update problems

CO4-Articulate socio-economic applications of distributed databases and use database recovery mechanisms

CO5-Familiarize with data warehousing and datamining applications

CO6-Apply Normalization techniques to normalize and improve the data base design

TEXT/REFERENCEBOOKS

1. Elmasri&Navathe,FundamentalsofDatabaseSystems,6thEdition,AddisonWesley,2010
2. Korth,Silberschatz&Sudarshan,DatabaseSystemConcepts,5thEdition,TataMcGrawHill, 2010.
3. RaghuRamakrishnan&Johannesgerhrke,DataBaseManagementSystems,3rdEdition,Tata Mc Graw Hill, 2002.
4. AbrahamSilberschatz, Henry.F.KorthandS.Sudharshan,“DatabaseSystemConcepts”,4th Edition, 2002.
5. JiaweiHanandMichelineKamber,“DataMiningConceptsandTechniques”,3rdEdition,Elsevier, 2012
6. JanL.Harrington,“Objectorienteddatabasedesign”,HarcourtIndiaprivatelimited2000.
7. http://nptel.iitm.ac.in/courses/IIT-MADRAS/Intro_to_Database_Systems_Design/index.php

ENDSEMESTEREXAMQUESTIONPAPERPATTERN

Max.Marks:100

ExamDuration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PARTB:2 Questions from each unit of internal choice, each carrying 16marks

80Marks

SBSB1202	DIGITAL COMPUTER FUNDAMENTALS	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To Understand the concept of digital systems
- To operate on various number systems and Simplify Boolean functions.
- To Design counters and understand the working of arithmetic logic and control unit

UNIT1

9Hrs.

Number systems - Conversion from one number system to another - compliments - Binary codes - Binary logic - Logic gates - Truth tables.

UNIT2

9Hrs.

Boolean Algebra - Axioms - Truth table simplification of Boolean function - Canonical and Standard forms: Sum of product, Product of Sum, Minterm-Canonical Sum of product Expression: Maxterm - Canonical Sum of product Expression: -Map method (up to 4 Variables).

UNIT3

9Hrs.

Combinational logic - Adders - Subtractors - Decoders - Encoders - Multiplexer - Demultiplexer -- Memory Unit ROM and RAM: SRAM and DRAM.

UNIT4

9Hrs.

Sequential Logic - RS, JK, D and T Flip flops - Registers -Shift Registers - Counters - Ripple Counters - Synchronous Counter - Design of Counters.

UNIT5

9Hrs.

Application of Digital Circuit: Mobile phones, Calculator, Digital Computer, Smart Card, Radio and Sensors- Digital Design of ALU - Design of Status Register- Design of accumulator

Max.45Hrs.

COURSE OUTCOMES

- CO1-To Understand the concept to digital systems
CO2-To operate on various number systems and Simplify Boolean functions.
CO3-To Distinguish logical and combinational circuits
CO4-To Design counters and understand the working of counters
CO5-To Design arithmetic logic and control unit
CO6-To evaluate the combinational circuits

TEXT/REFERENCE BOOKS

1. M.Morris Mano, "Computer System Architecture", Pearson Education, 2008.
2. Carter Nicholas, "Computer Architecture", Schaunoutline Sevies, Tata McGraw-Hill, 2008.
3. J.P.Hayes, "Computer Architecture & Organization", Tata McGraw Hill
4. Leach.D.P & Malvino.A.P, (2002), "Digital Principles and Applications", Fifth Edition, TMH. (UNIT I, II, III)
5. Moris Mano.M, (2001), "Digital Logic and Computer Design", Fourth Edition,
6. Ananthi Shashasaayee, Sheshasaayee.J.G, (2003), "Digital Logic Fundamentals", First Edition, Margham Publications

END SEMESTER EXAM QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PART B:2 Questions from each unit of internal choice, each carrying 16marks

80Mark

SBSB1301	ADVANCED JAVA PROGRAMMING	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- Develop server side programs in the form of servlets and JSP
- To know about Enterprise architecture models
- To introduce the basics of session tracking

UNIT1

9Hrs.

Introduction-Procedure vs.object-oriented programming- Concepts:Classes and Objects-Operator&FunctionOverloading-Inheritance-Polymorphism and Virtual Functions-Class Fundamentals-Declaring Objects-Methods-Constructors-Garbage Collection.Inheritance-Basics-Using Super - Method Overriding -Abstract Classes - Using final with inheritance. String Handling - String class - String buffer class.

UNIT2

9Hrs.

Introduction to Packages - User Defined Packages - Importing packages - Access protection - Interfaces- Exception Handling -Exception Types - Using try, catch, throw, throws and finally - Multithreading - Java Thread Model - Main thread - Creating multiple thread - Thread priorities - Synchronization.

UNIT3

9Hrs.

IO Package - Introduction- Input Stream and Output Stream classes- Data Output Stream and Data Input Stream classes -File Input Stream - File Output Stream. - Reader and Writer Classes - File Reader and File WriterJ2EEPlatform- - RMI Architecture- Overview of JNDI Java Database Connectivity -Introduction - Driver Types- Establishing a connection - Creating and Executing SQL Statement - Prepared Statement -The Result Set Object.

UNIT4

9Hrs.

Servlets: Servlets- Background- Life Cycle of a Servlet- HTTP protocol-Generic and Http Servlet-Handling HTTP Requests and Responses- Handling form data with get and post request.- App-Demonstrating Session-cookies- A simple Shopping cart using Sessions-Servlet Context Interface-ServletContextLifecycle-EventHandling-ServletCollaboration-ServletChaining-RequestDispatching.

UNIT5

9Hrs.

Java Server Pages - JSP Technologies - Difference between Servlets and JSP- JSP Directives - Scripting elements - Standard Actions - Implicit Objects -Simple Application - Introduction to Enterprise Java Beans -Session Beans-Entity Beans-Message Driven Beans.

Max.45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1- Implement Java programs with its functions and methods

CO2-Implement and develop J2EE Platform and packages **CO3-**

Outline the concept of Servlets and its lifecycle

CO4-Extend the Servlets Collaboration and cookies

CO5-Make use of JSP Technologies

CO6-To develop enterprise java applications thereby meeting the industrial requirements

TEXT/REFERENCEBOOKS

1. Subrahmanyam Allamaraju, Cedric Buest, John Davies, Tyler Jewell, Rod Johnson, Andy Longshaw, Ramesh Nagappan, P.G. Sarang, Alex Toussaint, Sameer Tyagi, Gary Watson,
2. Marc Wilcox, Alan Williamson, Professional Java Server Programming J2EE", 1.3 Edition, Wrox Publications.
3. Patrick Naughton, Herbert Schildt, "The Complete Reference Java 2", Third Edition, Tata McGrawhill
4. Thomas A. Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, McGraw Hill / Osborne.
5. Jayson Falkner, Kevin Jones, "Servlets and Java Server Pages, The J2EE Technology Web Tier", Pearson Education
6. James Holmes-Struts, "The complete Reference", 2nd Edition, Tata McGraw Hill, 2007.
7. Subrahmanyam Allamaraju and Cedric Buest, "Professional Java Server Programming", A press, J2EE 1.3, 2007.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A : 10 Questions of 2 marks each uniformly distributed - No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SBSB1302	COMPUTER ARCHITECTURE	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To impart knowledge on various types of Registers and Microinstructions.
- To discuss about the Data path design and Process or design in detail.
- To understand the types of memory organizations.

UNIT1

9Hrs.

Number systems - Conversion from one number system to another - Compliments - **Binary codes** - Binary logic - Binary Arithmetic - **Logic gates** - Truth tables. Boolean Algebra - Axioms - Truth table simplification of Boolean function - Map method - Mc-Clausky tabulation method.

UNIT2

9Hrs.

Combinational Logic: Adders-Half Adders-Full Adders - Subtractors-Half Subtractor-Full Subtractor - Decoders - Encoders - Multiplexer - Demultiplexer Sequential logic: RS, JK, D and T Flip flops - Registers -Shift Registers Counters -Design of Counters.

UNIT3

9Hrs.

Associative Memory - Cache Memory - Virtual Memory - Auxiliary Memory **Management Hardware. Peripheral Devices - Input-Output Interface** - Asynchronous Data Transfer: Handshaking - Serial Transfer - **Communication Interface - Modes of Transfer - Priority Interrupt - DMA -Serial Communication- Devices - Input-Output Interface - Asynchronous Data Transfer: Handshaking- Serial Transfer - Communication Interface - Modes of Transfer - Priority Interrupt - DMA -Serial Communication.**

UNIT4

9Hrs.

Introduction to microcomputers, Microprocessors and Assembly languages - **Microprocessor architecture and its operations**- 8085 MPU - 8085 instruction set and Classifications.

UNIT5

9Hrs.

Central Processing unit: General register and stack organizations, instruction formats- Addressing modes, Data transfer and manipulation - program control, RISC - Pipelining - Arithmetic and instruction, RISC pipeline - vector processing and array processors.

Max.45Hrs.

COURSE OUTCOMES

CO1-Classify the various types of registers, microinstructions and addressing modes.

CO2-Design the data path for processor

CO3-Demonstrate the usage of Memory Organization.

CO4-Describe about the I/O devices.

CO5-Explain the characteristics, structure, communication, and synchronization of multiprocessor.

CO6-State the interprocessor communication and synchronization.

TEXT/REFERENCE BOOKS

1. M.Moris Mano, Computer system Architecture. PHI (Third edition, 1993)
2. M.M.Mano, Digital Logic and Computer Design, Prentice Hall of India, 1994.
3. Carl Hamacher, Uonko G. Vranesic, Safwat G. Zaky-Computer Organisation, McGraw Hill ISE 1987.
4. John, P. Hayes., Computer System architecture, McGraw Hill, ISE, 1988.
5. Hwang. K. Briggs. F. A-Computer Architecture and parallel Processing, McGraw Hill ISE, 1988.
6. T.C. Bartee, Computer Architecture and logical Design, McGraw Hill, 1991

END SEMESTER EXAM QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PART B:2 Questions from each unit of internal choice, each carrying 16marks

80Marks

SBSB1303	OPERATING SYSTEMS	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To learn how computers work and to learn about system design (performance vs. simplicity, HW vs. SW, etc.)
- To have an overview of different types of operating systems.
- To learn and implement the concept of process management.

UNIT1 INTRODUCTION TO OPERATING SYSTEM

9Hrs.

Introduction: Basic of Operating system - Views and Goals - Types of System - OS Structure - Components - Services - System Structure - Layered Approach - Process Management Introduction to Process - Process State- PCB- Process Scheduling - Cooperating Process - Thread- Inter process Communication.

UNIT2 OS SCHEDULING

9Hrs.

CPU Scheduling: Introduction types of CPU Schedulers - Scheduling Criteria - Scheduling Algorithms- FCFS Scheduling- SJF Scheduling- Priority Scheduling- Round Robin Scheduling- Multilevel Queue Scheduling- Data Dead lock- Basic concept of dead lock prevention - Deadlock Avoidance- Dead lock Detection and Memory.

UNIT3 MEMORY MANAGEMENT

9Hrs.

Basic Concept of Memory Address - Binding logical - Physical Address Space - Memory Allocation - Production Fragmentation and Compaction.

UNIT4 SWAPPING

9Hrs.

Using bits maps- using linked list Paging- Mapping of pages to frames- Hierarchical page tables- Segmentation Virtual Memory demand paging- Transaction look a side Buffer (TLB)- Inverted page table- Page replacement algorithms.

UNIT5 FILE MANAGEMENT

9Hrs.

File System: Basic Concepts of Files - Access Methods - Directory Structures - Protection Consistency Semantics - File System Structures - Allocation Methods - Various Disk Scheduling Algorithm. Free Space Management.

Max.45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1-Understand the fundamental components of a computer operating system and how computing resources are managed by the operating system.
- CO2-Apply the concepts of CPU scheduling, synchronization, and deadlocks in real computing problems.
- CO3-Demonstrate the different memory and I/O management techniques used in Operating Systems.
- CO4-Have practical exposure to the concepts of semaphores and monitors for process synchronization.
- CO5-Create design and construct the following OS components: Schedulers, Memory management systems in the modern operating system.
- CO6-Understand file system structure and implementation file system such as FAT.

TEXT/REFERENCE BOOK

1. Silberschatz P.B. Galvin, Gange., Operating System Concepts, 6th Edition., Addison-Wesley Publishing Co., 2002.
2. William Stallings, Operating Systems, Fourth Edition, PHI.
3. Andrew S. Tanenbaum, Operating Systems: Design and Implementation, Third Edition,

END SEMESTER EXAM QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PART B:2 Questions from each unit of internal choice, each carrying 16marks

80Marks

SBSB1304	DATA MINING AND DATA WAREHOUSING	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To understand the overall architecture of a data warehouse and techniques and methods for data gathering and data pre-processing
- Identify the scope and necessity of Data Mining & Warehousing for the society.
- Describe various Data Models and Design Methodologies of Data Warehousing destined to solve the root problems.

UNIT1

9Hrs.

Introduction To Data Warehouse- A Multidimensional Data Model - Data Warehouse architecture- Efficient Methods for Data Cube Computation- Further Development of Data Cube and OLAP Technology- Attribute-Oriented Induction. Introduction to Data Mining- Data Mining Functionalities- Classification of Data Mining systems, Major issues in Data Mining- Data preprocessing- Data cleaning- Data integration and Transformation.

UNIT2

9Hrs.

Data mining primitives: Task-relevant data-kind of knowledge to be mined- Background knowledge- interestingness measures- presentation.

UNIT3

9Hrs.

Visualization of discovered pattern- Data Mining Query language- Designing Graphical User interfaces based on DMQL - Architecture of Data mining. Basic concepts - market basket analysis - Mining single dimensional Boolean association rules from transactional databases. Classification & prediction: What's classification- issues regarding classification and prediction- Bayesian classification- prediction: linear- non linear.

UNIT4

9Hrs.

Types of Data in cluster analysis - Major clustering methods. Data mining applications- Clustering High Dimensional Data, Outlier Analysis. Mining Streams, Time-Series, And Sequence Data Mining Data Streams, Mining Time-Series Data, and Mining Sequence Patterns in Transactional Databases and Biological Data.

UNIT5

9Hrs.

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

Max. 45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1- Assess Raw Input Data and process it to provide suitable input for a range of data mining algorithm.

CO2- Design and Modelling of Data Warehouse.

CO3- Discover interesting pattern from large amount of data **CO4-**

Design and Deploy appropriate Classification Techniques **CO5-**

Able to cluster high dimensional Data

CO6- Apply suitable data mining techniques for various real time applications

TEXT/REFERENCEBOOKS

1. Jiawei Han & Micheline Kamber, Data Mining- Concepts and Techniques-2nd Edition- Morgan Kaufmann Publishers, 2006.
2. Immon.W.H., Building the Data Warehouse, Wiley Dream Tech, 3rd Edition, 2003.
3. Anahory S., Murray, D, Data Warehousing in the Real World, 1st Edition, Addison Wesley, 1997.
4. Arun K Pujari, Data Mining Techniques, 2nd edition, Universities Press.
5. Sam Anahory & Dennis Murray, Data Warehousing in the Real World- Pearson Edn Asia. K.P.Soman, S.Diwakar, V.Ajay, Insight into Data Mining, PHI, 2008.

END SEMESTER EXAM QUESTION PAPER PATTERN**Max.Marks:100****Exam Duration:3Hrs.****PART A :10 Questions of 2 marks each uniformly distributed - No choice****20Marks****PART B:2 Questions from each unit of internal choice, each carrying 16marks****80Marks**

SBSB1401	PYTHON PROGRAMMING	L	T	P	EL	Credits	Total Marks
		2	0	0	3	3	100

COURSE OBJECTIVES

- To provide Basic knowledge of Python
- To learn how to design and program Python applications.
- To learn how to use lists, tuples, and dictionaries in Python programs

UNIT1

9Hrs.

Overview of Programming: Structure of a Python Program ,ElementsofPython.

UNIT2

9Hrs.

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiersandkeywords,Literals,Strings,Operators(Arithmeticoperator,Relationaloperator,Logicalor Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).

UNIT3

9Hrs.

Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, exit function, Difference between break, continue and pass.), Defining Functions, default arguments, Errors and Exceptions.

UNIT4

9Hrs.

Iteration and Recursion: Conditional execution, Alternative execution, Nested conditionals, The return statement, Recursion, Stack diagrams for recursive functions, Multiple assignment, The while statement, Tables, Two-dimensional tables.

UNIT5

9Hrs.

Strings and Lists: String as a compound data type, Length, Traversal and the for loop, String slices, String comparison, A find function, Loopingand counting, List values, accessingelements, List length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, Nested lists.

Max.45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1-To provide Basic knowledge of Python

CO2-To learn how to design and program Python applications.

CO3-To learn how to use lists, tuples, and dictionaries in Python programs

CO4-To learn syntax of Python language

CO5-To create dynamic applications in Python

CO6-To implement object-oriented concepts using Python

TEXT/REFERENCE BOOKS

1. Allen Downey, Jeffrey Elkner, Chris Meyers. How to think like a computer scientist learning with Python / 1st Edition, 2012
2. Kenneth A. Lambert, The Fundamentals of Python: First Programs, 2011, Cengage Learning, ISBN: 9781111822705

END SEMESTER EXAM QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration:3Hrs.

PART A : 10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16marks

80Marks

SBSB1402	FOG AND CLOUD COMPUTING	L	T	P	EL	C	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To understand the basic concepts of cloud computing and cloud enables.
- To understand cloud services and multi-tenancy computing.
- To study about various models of cloud environments and virtualization.

UNIT1 INTRODUCTION OF CLOUD COMPUTING

9Hrs.

Basic Concepts and Cloud Computing - Cloud Computing Architectural Framework - Types of Clouds - pros and cons of cloud computing - Cloud Characteristics - difference between web 2.0 and cloud - key challenges in cloud computing - Major Cloud players - Virtualization in Cloud Computing - Parallelization in Cloud Computing

UNIT2 CLOUD SERVICE MODELS

9Hrs.

Service Models - Software as a Service (SaaS) - Infrastructure as a Service (IaaS) - Platform as a Service (PaaS) - pros and cons of Cloud Service Models Web services - Service Oriented Architecture (SoA) - Elastic Computing - On Demand Computing - Service Management in Cloud Computing - Characteristics of Cloud Service Management - Multitenancy computing, architecture - Benefit and Drawbacks of Multitenancy - Multitenant Cloud architecture.

UNIT3 CLOUD DEPLOYMENT MODELS AND VIRTUALIZATION

9Hrs.

Deployment models: Public cloud - Private Cloud - Hybrid cloud - Community cloud - Cloud Deployment of application on the cloud - Need for virtualization - Types of Virtualizations - Pros and cons of Virtualization - VMware - Process VM - Virtual Machine Monitor - Properties - Hypervisor - Xen Hypervisor, HyperV - VirtualBox, Eucalyptus.

UNIT4 UNDERSTANDING FOG COMPUTING

9Hrs.

Fog Computing: The Next Evolution of Cloud Computing - Cloud computing vs Fog Computing - Goal Of Fog Computing - Pros and Cons of Fog computing - Fog computing vs. edge computing - Fog computing and the Internet of Things -, Connecting IoT to cloud, Cloud Storage for IoT- Data management and analysis in Fog Computing.

UNIT5 FOG COMPUTING ARCHITECTURE & APPLICATIONS

9Hrs.

From Cloud to Fog - Fog Computing architecture - fog networks Fog Computing in the IoT Environment: Principles, Features, and Models - Role of Cloud Computing in IoT - Applications of fog computing - Security and privacy in Fog.

Max.45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1-Analyze the Cloud computing setup with its vulnerabilities and applications using different architectures.

CO2-Implement and install the cloud tools to make enable the cloud computing infrastructures.

CO3-Apply and design suitable Virtualization concept, and Cloud deployment Model. **CO4-**

Construct combinatorial auctions for cloud resources and services as commercial. **CO5-**

Assess cloud, Fog Network and cloud to Fog with IoT.

CO6-Ability to, understand fog computing architecture, Security, and privacy

TEXT/REFERENCEBOOKS

1. Cloudcomputingconcepts,technologyand Architecture-ThomasErl, ZaighamMahmood, Ricardo Puttini , Pearson , 2017.
2. InstantGuidetoCloudComputing,AnandNayar(Ed),Ashokkumar,sudeepTanwar,BPB,2019.
3. Cloudcomputingapradicalapproach-AnthonyT.Velte,TobyJ.VelteRobertElsenpeterTATAMcGraw - Hill, New Delhi - 2010.
4. CloudComputing:Web-BasedApplicationsThatChangetheWayYouWorkandCollaborate Online - Michael Miller - Que 2008.
5. Fog ComputingConcepts, Frameworks andTechnologies,Mahmood,Zaigham (Ed.),Springer,2018.
6. <https://internetofthingsagenda.techtarget.com/definition/fog-computing-fogging>

ENDSEMESTEREXAMQUESTIONPAPERPATTERN

Max.Marks:100

ExamDuration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PARTB:2 Questions from each unit of internal choice, each carrying 16marks

80Marks

SBSB1403	DATA STRUCTURES	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- It focuses on how to organize data form or efficient problem-solving using data structures methods and techniques.
- To impart the basic concepts of data structures and algorithms
- To be familiar with writing recursive methods.

UNIT1

9Hrs.

Arrays-LinkedList-SingleLinkedList-InsertionandDeletion-DoublyLinkedList.-CircularLinkedList - Stack-Queues- Array implementation of a Stack and queue - Linked List implementation of a Stack and Queue- Priority Queues.

UNIT2

9Hrs.

Evaluation of arithmetic expression using stack- Prefix -Infix-Postfix-notations, Converting infix expressions to postfix- Evaluation of postfix expression, -Towers of Hanoi problem.

UNIT3

9Hrs.

TreeStructures: Binary Trees- Implementation of Binary Trees- Linear Representation of Binary Tree Linked representation of a Binary Tree. Binary Tree Traversal: Pre order- In order - Post order.

UNIT4

9Hrs.

Sorting Techniques: Bubble Sort- Merge Sort - Shell Sort- Insertion Sort- Selection Sort-Quick Sort-Heap Sort, Searching Techniques:Sequential Search- Binary Search-Hashing- Indexing.

UNIT5

9Hrs.

Graphs and Networks: Implementation of Graphs- Adjacency Matrix- Depth First Search-BreathFirst Search. Networks: Minimum Spanning Tree- The Shortest path Algorithm.

Max.45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1-Understandtheconceptofrecursivealgorithms.
- CO2-Demonstratethedifferenttypesofdatastructures.
- CO3-Abletounderstandtheoperationsonlineardatastructures.
- CO4-Summarizesearchingandsortingtechniques.
- CO5-Chooseappropriatedatastructureasappliedtospecifiedproblemdefinition.
- CO6-Understandandimplementtheapplicationsoflineardatastructures.

TEXT/REFERENCE BOOKS

1. E.Horowitz, S.Sahni, FundamentalsofDataStructures.
2. BhagatSinghandThomasL, IntroductiontoDataStructures, Naps, TMH.
3. Helieman, DataStructures, AlgorithmsandObject-OrientedProgramming.
4. ThomasHCoreman, CharlesELeiserson, RonaldLRivest, IntroductiontoAlgorithms, PHI2002.
5. Jean-PaulTremblay, PaulG.Sorenson, 'AnIntroductiontoDataStructureswith
6. Application', TMH, 2017.
7. RichardF, Gilberg, Forouzan, "DataStructures", Cengage, 2004, 2ndEdition.
8. Larry R. Nyhoff, ADTs, Data Structures, and Problem Solving with C++, Prentice Hall Editin, 2004.
9. ThomasH.Cormen, CharlesE.Leiserson, "IntroductiontoAlgorithms", 3rdEdition, 2010.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max.Marks:100

ExamDuration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PARTB:2 Questions from each unit of internal choice, each carrying16marks

80Marks

SBSB1404	CYBER SECURITY	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To introduce the basic concepts of cyber security
- To acquire knowledge on cyber threats and attacks
- To become aware of significant security technologies and tools

UNIT1 INTRODUCTION TO CYBER SECURITY

9Hrs.

Introduction - Need for Security - Security Approaches - Principles of Security - Components - Balancing Security & Access - Software Development Life Cycle - Security Systems Development Life Cycle - Security Professionals and the organization.

UNIT2 CYBER SECURITY - THREATS & ATTACKS

9Hrs.

Threats: Intellectual Property - Software Attacks - Deviations in QoS - Espionage - Forces of Nature - Human Error - Information Extortion - Missing, inadequate or incomplete organization policy and Controls - sabotage - Theft - Hardware Failures - Software Failures - Attacks: Malicious Code - Hoaxes - Back Doors - Password Crack - Brute Force - DoS and DDoS - Spoofing - Man-in-the-Middle - Spam - Email Bombing - Sniffer - Timing Attack.

UNIT3 SECURITY TOOLS & TECHNOLOGIES

9Hrs.

Firewall and VPNs - Intrusion Detection and Prevention Systems - Other Security Tools - Access Control - Firewalls - Protecting Remote Connections - Intrusion Detection and Prevention Systems - Honeypots, Honeynets and Padded Cell Systems.

UNIT4 CRYPTOGRAPHY

9Hrs.

Cryptology Terminology - Cipher methods - Cryptographic Algorithms - Cryptographic tools - Attacks on cryptosystems - Physical Security.

UNIT5 PROTOCOLS FOR SECURE COMMUNICATION

9Hrs.

Basic Concepts - SHTTP, SSL & SET - S/MIME, PEM & PGP - WEP, WPA & WPA2 - IPSEC & PGP.

Max. 45Hrs.

COURSE OUTCOME

On completion of the course, student will be able to

CO1-Understand the basic concepts, need, approaches, principles and components of security.

CO2-Explain the various cyber threats and attacks.

CO3-Describe the various Security Technologies and Tools

CO4-Explain the basic principles of cryptography and algorithms.

CO5-Examine the various protocols for secure communication.

CO6-Explore the significant aspects of cyber security.

TEXT/REFERENCE BOOKS

1. Michael E. Whitman, Herbert J. Mattord, "Principles of Information Security", CENGAGE Learning, 4th Edition.
2. William Stallings, "Cryptography and Network Security - Principles and Practice", Pearson Education, 7th Edition.
3. Atul Kahate, "Cryptography and Network Security", McGraw Hill, 4th Edition.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3Hrs.

PART A : 10 Questions of 2 marks each uniformly distributed - No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SBSBLH51	FULL STACK WEBDEVELOPMENT	L	T	P	EL	Credits	Total Marks
		2	0	4	0	4	100

COURSE OBJECTIVES

- To provide knowledge of languages ,frameworks, and tools to create interactive and engaging websites
- To provide basic design principles to presentide as,information,products,and serviceson websites
- To induce basic programming principles to the construction of websites

UNIT1

9Hrs.

Introduction to Dynamic Web Content-Three-tier architecture-architecture for client-server applications- Introduction to HTML5-Elements, Tags and Attributes- Formatting Tags - Styles - List, Table, Phrase- Embedding Audio and Video - Block elementsand Layouts- Forms -The HTML5 Canvas.

Practice:

1. WriteanHTMLdocumentwithanexampleofOrderedListandUnorderedList.
2. WriteanHTMLdocumentwithanexampleofTableformattoprintyourBio-Data.

UNIT2

9Hrs.

Introductions to CSS-Box Modeland Text properties- Font and Display Properties- Floatand Overflow- Link - List - Table- Forms- Web Layout- Accessing CSS from JavaScript- Expressions and Control Flow in JavaScript-JavaScript Functions, Objects, and Arrays- Event and Event Listeners - Closure- Classes - Fetch API.

Practice:

1. Createalloginformwithverificationandvalidations
2. Createasimplewebpagewithwebsitevisitorcounter

UNIT3

9Hrs.

Introduction to PHP. -Expressionsand ControlFlow in PHP. -PHP Functions and Objects-PHP Arrays- GET, POST variables- Embedding PHP-PHP and MySQL

Practice:

1. WriteaPHPscriptto:-
2. a)transformastringalluppercaseletters
b)transformastringalllowercaseletters.
3. WriteaPHPscripttoremovecomma(s)fromthefollowingnumericstring
4. WriteaPHPscripttoremovepartofastring

UNIT4

9Hrs.

IntroductiontoAngularJS,-AngularJS-Overview-EnvironmentSetup-MVCArchitecture-Directives- Expressions- Controllers - Filters - Tables- Animations

Practice:

1. CreateaweatherApplication
2. Createasoundnoteapplication

UNIT5

9Hrs.

HTMLDOM -Modules-Forms - Includes - AJAX - Views -Scopes -Services-DependencyInjection -Custom Directives - Fetching Data from a PHP Server Running MySQL

1. CreateaprogramusingPHPandMySQL
 - a. StudentInformationSystem
 - b. PayrollSystem
 - c. InventoryManagementSystem

COURSE OUTCOME

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

CO1-Understand and develop HTML applications

CO2-Design and style webpage using CSS

CO3-Design webpage to perform form validation using client-side scripting language

CO4-Implement new technologies such as AngularJS

CO5-Develop web applications using server-side scripting language..

CO6-Understand the differences between usability and user experience.

SBSB1501	MOBILE APPLICATION DEVELOPMENT	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To develop applications for current and emerging mobile computing devices, performing tasks at all stages of the software development life-cycle.
- To learn how to utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
- To understand the programming languages and platform for developing mobile applications.

UNIT1 INTRODUCTION TO ANDROID

9Hrs.

Introduction to mobile technologies, mobile operation systems, Mobile devices - pros and cons, Introduction to Android, Versions, Features, Architecture, UI Widgets and Events handling, Layouts, required tools - Eclipse, ADT, AVD, Application structure, Android Manifest file, Creating Android applications.

UNIT2 BUILDING BLOCKS AND DATABASES

9Hrs.

Introduction to Activities and Intents - Understanding Activity life cycle, Linking Activities, Passing Data, Toast, Displaying a Dialog Window and Notifications. Content Provider, Services, Broadcast receivers, accessing databases, Location and sensors, Multimedia audio, video and camera, Deploying and publishing application.

UNIT3 OBJECTIVE C PROGRAMMING

9Hrs.

Objective C - Objects and Classes, Property, Messaging, Categories and Extensions, Fast Enumeration - NSArray, NSDictionary, Methods and Selectors, Static & Dynamic objects, Exception handling, Memory management, Swift language essentials: Arrays, Dictionaries, functions.

UNIT4 INTRODUCTION TO iOS

9Hrs.

Introduction to iPhone, MVC Architecture, View Controller - Building the UI and Event handling, Application life cycle, Tab Bars, Story Boards and Navigation Controllers, Table View, Push Notification, Database handling, Introduction to iCloud, Webkit framework in iOS8, Deploying and publishing application.

UNIT5 WINDOWS MOBILE APP DEVELOPMENT

9Hrs.

Introduction to Windows Phone 8, Application Life cycle, UI Designing and events, Building, Files and Storage, Network Communication, Push Notification, Background Agents, Maps and Locations, Data Access and storage, Introduction to Silverlight and XAML, Data Binding, Deploying and Publishing.

Max. 45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Learn and understand the technology and business trends impacting mobile applications. **CO2** -

Understand and remember the components of android, iOS and Windows mobile applications. **CO3** - Learn the programming languages and techniques for developing mobile applications.

CO4 - Design the mobile application by using Eclipse with ADT / Android Studio, Objective-C and Swift.

CO5 - Develop mobile application with compelling user interface and database connectivity for real time applications.

CO6 - Deploy mobile applications using an appropriate software development and finally, upload the developed App into the web.

TEXT/REFERENCEBOOKS

1. RetoMeier, "ProfessionalAndroidApplicationDevelopment", Wrox, 4th Edition, 2018.
2. <http://www.tutorialspoint.com/android/index.htm>
3. <http://developer.android.com/training/index.html>
4. StephenG.Kochan, "ProgramminginObjectiveC", AddisonWesley, 4th Edition, 2012.
5. DavidMark, JackNuttingandJeffLaMarche, "BeginningiOS5Development", ApressEdition, 2012.
6. Baijian Yang, Pei Zheng, LionelM. Ni, "ProfessionalMicrosoftSmartphoneProgramming", Wrox Edition, 2011.

ENDSEMESTEREXAMQUESTIONPAPERPATTERN

Max.Marks:100

ExamDuration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PARTB:2 Questions from each unit of internal choice, each carrying16marks

80Marks

SBSB1502	FUNDAMENTALS OF MICROPROCESSOR	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- The prime objective of this course is to introduce to the students the fundamentals of Microprocessor Microcontroller and Arduino.
- The students will be equipped with the basic knowledge of microprocessor, microcontroller, and Arduino
- The students will have the knowledge of interfacing microprocessor, microcontroller, Arduino and their applications.

UNIT1 INTRODUCTION TO INTEL 8085

9Hrs.

Evolution of Microprocessor-Architecture of 8085-Instruction format-Addressing modes-Basic timing diagram of opcode fetch, memory read, memory write I/O read and I/O write- Interrupts of 8085-Software interrupts, Hardware interrupts, Priorities of interrupts 8085 based system design.

UNIT2 INTEL 8085 INTERFACING

9Hrs.

Interfacing devices-8255 Programmable Peripherals Interface-Architecture & various modes of operation- 8251 USART Architecture and programming features-8237, interfacing with ADC and DAC, LCD, keyboard Interface. Application: Stepper Motor Control, Temperature Control.

UNIT3 INTRODUCTION TO 8051

9Hrs.

Introduction to 8-bit Microcontrollers - 8051/8051, Microcontroller Architecture - Internal RAM & Internal ROM, Instruction set, Addressing Modes, Simple programs.

UNIT4 INTERNAL PERIPHERALS OF 8051

9Hrs.

Modes of Timer/Counter operation - Serial Port operation & Modes - Interrupt Structure of 8051 - Memory Interfacing with 8051- I/O ports- Input and output devices interfacing with 8051.

UNIT5 ARDUINO UNO

9Hrs.

Arduino - Architecture, Pin diagram, Programming Structure, Simple program to blink LED, Subroutine, 16x2 LED display, interfacing with Arduino: LCD, Temperature Sensor, Humidity Sensor and ultrasonic sensor.

Max. 45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1- Understanding architectural principle of 8085 & 8051.
- CO2- Interpret the various peripheral devices with 8085 & 8051 microprocessor
- CO3- Design and implement programs on 8051 microprocessors.
- CO4- Examine various I/O devices with 8051 microcontrollers
- CO5- Apply Arduino code and how to interface various sensors with the Arduino Board.

CO6- Implement the interface circuit with various sensor and I/O devices with microprocessor and microcontroller and Arduino Board.

TEXT/REFERENCE BOOKS

1. Ramesh S Gaonkar, Microprocessor Architecture, Programming, and application with 8085, 4th Edition, Penram International Publishing, New Delhi, 2000.
2. Kenneth J. Ayala, 8051 Microcontroller, Thomson, 2005.
3. Charles M. Gilmore, Microprocessor Principle and Application, McGraw Hill Publication, 1995.
4. Nagoor Kani A., Microprocessor & Microcontroller, Tata McGraw Hill, 3rd Edition, 2012.
5. Ram B., Fundamentals of Microprocessors and Microcomputers, Dhanpat Rai Publications, 2001.
6. Michael McRoberts, beginning Arduino, 2nd Edition, 2013.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3Hrs.

PART A : 10 Questions of 2 marks each uniformly distributed - No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SBSB1601	ETHICAL HACKING	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To introduce the basic concepts of Ethical Hacking and Penetration Testing
- To acquire knowledge about gathering information about the victim
- To demonstrate Enumeration and Port Scanning

UNIT1 INTRODUCTION TO ETHICAL HACKING

9Hrs.

Important Terminologies - Categories of Penetration Test - Writing Reports - Structure of PT report - Vulnerability Assessment Summary-Risk Assessment-Methodology-Detailed Findings-Reports

UNIT2 INFORMATION GATHERING

9Hrs.

Active and Passive Information Gathering - Sources - Copying Website locally - yougetsignal.com - NeoTrace - Intercepting a Response - Acunetix Vulnerability Scanner - NetCraft - Google Hacking - Interacting with DNS Servers - DNS Cache Snooping.

UNIT3 ENUMERATION AND PORT SCANNING

9Hrs.

Host Discovery - Scanning for Open Ports and Services - Types of Port Scanning - TCP Three-way handshake - TCP Flags - Port Status Types - TCP SYN Scan- TCP Connect Scan - NULL, FIN and XMAS SCAN - NULL Scan -FIN Scan -XMAS Scan -TCPACK Scan -Responses -UDPPortScan- Scanning a vulnerable host- Performing an IDLE scan with NMAP- Service Version Detection - OS Fingerprinting.

UNIT4 VULNERABILITY SCANNING

9Hrs.

Working with Vulnerability Scanners - Nmap - Testing SCADA Environments - Nessus Vulnerability Scanner-Installing Nessus-Adding a user-Creating a new policy-Safe Checks-Silent Dependencies - Port Range - Preferences.

UNIT5 NETWORK SNIFFING

9Hrs.

Introduction-Types of Sniffing-Hubs vs. Switches-Promiscuous Mode vs. Non-Promiscuous Mode- MITM Attacks - ARP Protocol Basics - How ARP works - ARP attacks - DoS Attacks - Sniffing with Wireshark - DNS Spoofing - DHCP Spoofing.

Max.45Hrs.

COURSE OUTCOMES

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

C01-Understand the basic concepts of Ethical Hacking and Penetration Testing and will be able to prepare penetration testing reports.

C02-Demonstrate information gathering about the victim using various tools such as acunetix, net craft and Google hacking

C03-Enumerate and perform different types of scanning and demonstrate in map.

C04-Explore the vulnerability scanners: nmap and Nessus.

C05-Understand and demonstrate sniffing, MITM attacks, ARP attacks and DoS attacks.

C06-Explore the crucial areas of Ethical Hacking and Penetration Testing with Case Studies.

TEXT/REFERENCE BOOKS

1. Rafay Baloch, "Ethical Hacking and Penetration Testing Guide", CRC Press-Taylor & Francis Group, 2015.
2. Jon Erickson, "Hacking - The Art of Exploitation", No Starch Press, San Francisco, 2nd Edition, 2008.
3. Shon Harris, Allen Harper, Chris Eagle and Jonathan Ness, Gray Hat Hacking: "The Ethical Hackers Handbook", TMH, 3rd Edition, 2011.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration:3Hrs.

PART A : 10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80Marks

SBSB1602	SOCIETY 5.0	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSEOBJECTIVE

- To understand the society5.0, Cyberspace And Physical Space to solve
- To Provide knowledge and overview about Bigdata, IoT and Artificial Intelligence for Society 5.0.
- Discuss To understand Augmented Reality and Virtual Reality, Next Generation Sensors

UNIT1 INTRODUCTIONTOSOCIETY5.0

9Hrs.

Introduction -Schema of society 5.0-Characteristics of Society 5.0. Introduction to communication technologies: Artificial Intelligence - robotics - 3D Printing. People: Centric Society -Knowledge Sharing-Physicalspace-Cyberspace-HumanityVSSociety5.0-ElementsofSociety5.0-DataDrivento Society-Modeling real world Issues.

UNIT2 EMERGINGTECHNOLOGIESWITHSOCIETY5.0

9Hrs.

Introduction to Big Data -Issuesand Challengesin the traditional systems-Intelligent Data Analysis- Big Data Storage Statistical Concepts: Sampling Distributions - Re-Sampling - Prediction Error - Random Sampling- Artificial Intelligence - - Foundations of AI - Intelligent agent - Types of agents - Structure - Problem solving agents-Internet of Things- Introduction to IoT- Basic Architecture of an IoT, From M2M to IoT, M2M towards IoT-Robotics- Robotics system components - Robot classification Coordinate frames- degree of freedom - dynamic stabilization of robots.

UNIT3 INTRODUCTIONTOINDUSTRY4.0

9Hrs.

Introduction-Globalization and Emerging Issues, LEAN Production Systems, Smart and Connected Business Perspective, Cyber Physical Systems and Next Generation Sensors, Augmented Reality and VirtualReality, Artificial Intelligence, BigData and Advanced Analysis- An emerging industrialstructurefor IoT -Cyber security in Industry 4.0-Basics of Industrial IoT. Common Issues in Industry 4.0 and Society 5.0.

UNIT4 CHALLENGESANDTECHNOLOGIESTOWARDSSOCIETY5.0

9Hrs.

Overcome with Economic Development and Solution to Social Problems in Society 5.0- Security of Cyber Physical Systems -Embedded and CPS security - attacks and countermeasures, authentication, identification, confidentiality, data integrity, authorization, access control, malware attacks and counter measures, security protocols-Social Issues in Society5.0-human-centeredociety (Society5.0)- Sustainable Development Goals-Economic Advancement-Resolution to Social Problems..

UNIT5 INNOVATIONWITHFUTURETRENDSWITHAPPLICATIONS

9Hrs.

Mobility-HealthCare-Agriculture-FoodProducts-DisasterPrevention.

Max.45Hrs.

COURSEOUTCOMES

- CO1-Able to understand the Social Problems by A System That Highly Integrates Cyber space and Physical Space to solve
- CO2- Ability to get skills For Economic Development and A Human-Cantered Society That Balances Economic Advancement
- CO3-Achieve A High Degree of Convergence Between Cyberspace (Virtual Space) And Physical Space (Real Space)
- CO4-Able to Use Of Emerging Technologies With Society 5.0 To Achieve The More Production / Avoid Loss Of Productions
- CO5-Able Internet and IoT, Bigdata for production lines to be adaptive, intelligent, and flexible enough to meet the updated requests.
- CO6-Design and apply in Health Care, Agriculture, FoodProducts,DisasterPrevention

TEXT/REFERENCEBOOKS

1. Society5.0A People-Centric Super-Smart Society, Hitachi-Utokyo Laboratory, Springer, 2020.
2. Society5.0 Industry of the Future Technologies Methods and Tools By Bruno Salgues, Wiley, 2018
3. Stuart J. Russell, Peter Norvig, "Artificial Intelligence A Modern Approach", 3rd Edition, Pearson Education, 2009.
4. The Internet of Things: Applications and Protocols, Wiley publications. Author(s): Oliver Hersent, David Boswarthick, Omar Elloumi., 2012.
5. McKerrow P.J. "Introduction to Robotics", Addison Wesley, USA, 1991.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration:3Hrs.

PART A :10 Questions of 2 marks each uniformly distributed - No choice

20Marks

PART B:2 Questions from each unit of internal choice, each carrying 16marks

80Marks

