



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited A++ Grade by NAAC | 12B Status by UGC | Approved by AICTE
www.sathyabama.ac.in

School of Science and Humanities Department of Computer Science

1.1.3 Courses having focus on Employability / Entrepreneurship / Skill Development

Programme:

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Employability			
1	SBSB1101	Problem solving Techniques with c	3
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 Employabil

 Entrepreneurs

 Skill

Entrepreneurship			
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Skill Development			
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3	SBSB1303	Operating System	12
4	SBSB1307	Computer Networks	13
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7	SBSB1403	Data Structures	18
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SBSB1101	PROBLEMSOLVING TECHNIQUES WITH C	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSEOBJECTIVES

- 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 INTRODUCTIONTOCOMPUTERPROBLEMSOLVING

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 BASICSOFCPROGRAMMING

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- FactorialComputation.

UNIT3 ARRAYSANDSTRINGS

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-handlingFunctions, ExamplePrograms(withandwithoutusingbuilt-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 POINTERSANDFILEPROCESSING

9Hrs.

Pointers: Introduction, Arrays Using Pointers - Structures Using Pointers - Functions Using Pointer, DynamicMemoryAllocation,StorageClasses,FileHandlingin 'C'. Algorithms: Swap elements using Call by Reference - Sorting Arrays using pointers- Finding sum of array elements using Dynamic Memory Allocation.

Max.45Hrs.

COURSEOUTCOMES

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

80Ma

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

COURSE OBJECTIVES

- 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 - Concurrency control techniques- Database recovery techniques- Database security and Authorization. Introduction to Emerging Database Technologies and Application

Max.45Hrs.

COURSE OUTCOMES

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 a broad 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 data mining applications

CO6-Apply Normalization techniques to normalize and improve the database 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.MorrisMano, "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. MorisMano.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

UNIT 1

9 Hrs.

Introduction-Procedure vs. object-oriented programming-Concepts: **Classes and Objects-Operator & Function Overloading-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.

UNIT 2

9 Hrs.

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.

UNIT 3

9 Hrs.

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 Writer J2EEPlatform- - 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.**

UNIT 4

9 Hrs.

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- Servlet Context Life cycle-Event Handling-Servlet Collaboration-Servlet Chaining-Request Dispatching.

UNIT 5

9 Hrs.

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.45 Hrs.

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 there by meeting the Industrial requirements

TEXT / REFERENCE BOOKS

1. Subrahmanyam Allama raju, Cedric Buest, John Davies, Tyler Jewell, Rod Johnson, Andy Long shaw, 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, HerbertSchildt,"TheCompleteReferenceJava2",ThirdEdition,TataMcGrawhill
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-Structs,"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

SBSB1307	COMPUTER NETWORKS	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To understand the concept of data communication and modulation techniques.
- To get a general overview of "Computer Networks"
- To know the functions of Data link layer

UNIT 1

9 Hrs.

Introduction to Data Communication, Network. Protocols & standards and standards organizations - Line Configuration - Topology - Transmission node - Classification of Network OSI Model - Layers of OSI Model.

UNIT 2

9 Hrs.

Parallel and Serial Transmission - DTE/DCE/such as EIA-449, EIA-530 EIA-202 and x.21 interface - Interface standards - Modems - Guided Media Unguided Media - Performance - Types of Error - Error Detection - Error Corrections.

UNIT 3

9 Hrs.

Multiplexing - types of Multiplexing - Multiplexing Application - Telephone systems project 802 - Ethernet - Token Bus - Token Ring FDD IEEE 802.6 - SMDS - Circuit Switching - Packet switching - Message switching Connection oriented and connectionless services.

UNIT 4

9 Hrs.

History of Analog and Digital Network - Access to ISDN - ISDN Layers - Broadband ISDN X.25 Layers - Packet Layer Protocol- ATM - ATM Technology - ATM protocol.

UNIT 5

9 Hrs.

Repeaters Bridges Routers - Gateway - Routing algorithms - TCP/IP Network, Transport and Application Layers of TCP/IP - World Wide Web.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - To understand the concept of data communication and modulation techniques.

CO2 - To get a general overview of "Computer Networks"

CO3 - To know the functions of Data link layer

CO4 - To understand network layer functions and protocols used

CO5 - To learn about transport layer, session, presentation, and application layer

CO6 - To understand the working of routers, gateway, and world wide web

TEXT / REFERENCE BOOKS

1. Behrouz and Forouzan - Introduction to Data Communication and Networking - 2nd Edition - TMH - 2001.
2. Jean Walrand Communication Networks (A first course) - Second Edition - WCB McGraw Hill - 1998.
3. Andrew S Tanenbaum, Computer Networks, Third edition, Tata McGraw Hill, 2006
4. Fred Halsall, Data Communications, Computer Networks and Open Systems, 4th Edition , Addison Wesley,, 2000.
5. William Stallings, (2006), "Data and Computer Communication", 7th Edition, Pearson Education. Unit (IV - V)

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

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

SBSB1407	LINUX AND SHELL PROGRAMMING	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- Student will be able to write simple shell programming using Linux utilities, pipes and filters.
- To understand file system, process management and memory management
- To learn various commands used by Linux shell which makes the users to interact with each other.

UNIT 1

9 Hrs.

Introduction to LINUX Operating System: Introduction - The LINUX Operating System - Managing Files and Directories: Introduction - Directory Commands in LINUX - File Commands in LINUX.

UNIT 2

9 Hrs.

Creating files using the vi editor: Text editors - The vi editor. Managing Documents: Locating files in LINUX - Standard files - Redirection - Filters - Pipes.

UNIT 3

9 Hrs.

Securing files in LINUX: File access permissions - viewing File access permissions - Changing File access permissions. Automating Tasks using Shell Scripts: Introduction - Variables- Local and Global Shell variables - Command Substitution.

UNIT 4

9 Hrs.

Using Conditional Execution in Shell Scripts: Conditional Execution - The case...esac Construct. Managing repetitive tasks using Shell Scripts: Using Iteration in Shell Scripts - The while construct - until construct - for construct - break and continue commands - Simple Programs using Shell Scripts.

UNIT 5

9 Hrs.

Pipe, process pipes, the pipe call, parent and child processes, and named pipes: fifos, semaphores: semget, semop, semctl, message queues: msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands. Sockets- Socket, socket connections - socket attributes, socket addresses, socket, connect, bind, listen, accept, socket communications.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1** - Describe the architecture and features of Linux Operating System and distinguish it from another Operating System
- CO2** - Develop Linux utilities to perform File processing, Directory handling, User Management and display system configuration
- CO3** - Develop utilities to perform User Management and Display system configuration
- CO4** - Develop shell scripts using pipes, redirection, filters and Pipes
- CO5** - Apply and change the ownership and file permissions using advance Unix commands
- CO6** - Build Regular expression to perform pattern matching using utilities and implement shell scripts for real time applications.

TEXT / REFERENCE BOOKS

1. Operating System LINUX, NIIT, PHI, 2006, Eastern Economy Edition.
2. N.B. Venkateswarlu , Introduction to Linux: Installation and Programming, BS Publications, 2008, 1st Edition.

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

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 WEB DEVELOPMENT	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. Createaloginformwithverificationandvalidations
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.

SBSB1506	ARTIFICIAL INTELLIGENCE	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To understand the various characteristics of intelligent agents.
- To learn the different search strategies in AI.
- To understand the knowledge in solving AI problems.

UNIT 1 INTRODUCTION AND PROBLEM SOLVING

9 Hrs.

Introduction - Foundations of AI - History of AI - Intelligent agent - Types of agents - Structure - Problem solving agents - Uninformed search strategies - Breadth first search - Uniform cost search - Depth first search - Depth limited search - Bidirectional search - Searching with partial Information.

UNIT 2 INFORMED SEARCH AND GAME PLAYING

9 Hrs.

Informed search - Strategies - A* Heuristic function - Hill Climbing - Simulated Annealing - Constraint Specification problem - Local Search in continuous space - Genetic algorithm - Optimal decisions in games - Pruning - Imperfect decisions -Alpha-Beta pruning - Games that include an element of chance.

UNIT 3 KNOWLEDGE AND REASONING

9 Hrs.

Knowledge based agent - The Wumpus world environment - Propositional logic - Inference rules - First-order logic - Syntax and semantics - Situation calculus - Building a knowledge base - Electronic circuit domain - Ontological Engineering - Forward and backward chaining - Resolution - Truth maintenance system-Mental Events and Mental Objects.

UNIT 4 ACTING LOGICALLY

9 Hrs.

Planning - Representation of planning - Partial order planning -Planning and acting in real world - Acting under uncertainty- Bayes's rules - Semantics of Belief networks - Inference in Belief networks - Making simple decisions - Making complex decisions.

UNIT 5 APPLICATIONS

9 Hrs.

AI applications - Language Models - Information Retrieval- Information Extraction - Natural Language Processing - Machine Translation - Speech Recognition - Robot - Hardware - Perception - Planning - Moving.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 - An ability to identify, analyze the search algorithm for the AI problems.
- CO2 - Represent a problem using first order logic.
- CO3 - Provide the knowledge based agent to solve the problem.
- CO4 - Understand the Informed search strategies.
- CO5 - Apply the baye's rule to solve the problem for societal concern.
- CO6 - Design user centric applications that use AI concepts.

TEXT / REFERENCE BOOKS

1. Stuart J. Russel, Peter Norvig, "Artificial Intelligence A Modern Approach ", 3rd Edition, Pearson Education, 2009.
2. Elaine Rich, Kevin Knight, "Artificial Intelligence", 3rd Edition, Tata McGraw Hill, 2009.
3. M. Tim Jones, "Artificial Intelligence: A Systems Approach (Computer Science)", Jones and Bartlett Publishers, Inc., 1st Edition, 2008.

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

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

SBSB1604	CRYPTOGRAPHY AND NETWORK SECURITY	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To explore the aspects of classic and public key cryptography.
- To acquire knowledge on standard algorithms used to provide confidentiality, integrity and authenticity.
- To become aware of system security components.

UNIT 1 INTRODUCTION

9 Hrs.

Basic Concepts - Security Architecture, Attacks, Services, Mechanisms, Model - Cryptography Basics - Symmetric Ciphers- Transposition, Substitution, Rotor Machines - Block Cipher - Data Encryption Standard - Confidentiality using Symmetric Encryption.

UNIT 2 PUBLIC KEY CRYPTOGRAPHY

9 Hrs.

Principles - RSA algorithm - Key Management - Diffie Hellman Key Exchange -Message Authentication - Requirements, Functions, Message Authentication - Hash Functions - Digital Signatures - Authentication Protocols.

UNIT 3 SYSTEM SECURITY

9 Hrs.

Intruders - Detection - Password Management - Malicious Software - Virus - Countermeasures - Distributed Denial of Service Attacks - Firewalls - Design Principles - Trusted Systems.

UNIT 4 OPERATIONS AND PHYSICAL SECURITY

9 Hrs.

Origin - Process - Laws -Physical Security - Controls - Protecting People - Protecting Data - Protecting Equipment.

UNIT 5 APPLICATION SECURITY

9 Hrs.

Software Development Vulnerabilities - Buffer Overflow - Race Condition - Web Security - Database Security - Tools.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 - Identify the basics of cryptography.
- CO2 - Provide security of the data over the network.
- CO3 - Explore the aspects of system security.
- CO4 - Illustrate operations and physical security aspects.

CO5 - Analyze the vulnerabilities in any computing system and hence be able to design a security solution.

CO6 - Design and implement secure applications.

TEXT / REFERENCE BOOKS

1. William Stallings, "Cryptography and Network Security", 4th Edition, Pearson, 2009.
2. Jason Andress, Steven Winterfeld, "The Basics of Information Security", 2nd Edition, Elsevier, 2014.
3. Harold F.Tipton, Micki Krause Nozaki, " Information Security Management Handbook", 6th Edition, Vol.5, CRC Press, 2012.
4. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw-Hill, 2008.

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

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-centered society (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. Society5.0APeople-CentricSuper-SmartSociety,Hitachi-UtokyoLaboratory, Springer,2020.

2. Society 5.0 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: 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

