

List of New Courses Introduced in the Academic Year 2020-2021

ODD SEM

S.No	Course Code	Name of the Course
1	SCSA2105	Problem Solving Techniques Lab
	SCSA2302	Code Optimization and Debugging-I
3	S IT1604	Virtualization Techniques
4	S IT1608	Green Computing
5	SIT1612	Cyber Forensics

SCSA2105	PROBLEM SOLVING TECHNIQUES LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- Identify the problem.
- To analyse the various steps in program development.
- Evaluate and select the best algorithm to solve the problem.
- Deploy suitable methods to get the desired output.
- Create the solutions for various Real-World Problems

SUGGESTED LIST OF EXPERIMENTS:

1. Program to find GCD.
2. Program to find the max and min from the three numbers.
3. Program to find Exponentiation.
4. Program to find sum of an array of numbers.
5. Program to implement Sine function computation.
6. Program to Generate the Fibonacci sequence.
7. Program to find the roots of a Quadratic equation.
8. Program for reversing the digits of an integer.
9. Program to find the smallest divisor of an integer.
10. Program to Generate Prime Numbers.
11. Program to Raise a Number to a Large Power.
12. Program for Removal of Duplicates.
13. Program to find the kth smallest Element.
14. Program to generate histogram.
15. Program for addition and multiplication of matrices.
16. Program that converts a number ranging from 1 to 50 to Roman equivalent
17. To delete n Characters from a given position in a given string.
18. Program to search for a Key value in a given list of integers using linear search method.
19. Program to sort the number in ascending and descending order.
20. Program for finding the factorial using recursive and non-recursive functions

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1: Analyse and classify the given problem into various modules
- CO2: Analysing the complexity of problems, modularize the problems into small modules and then convert them into programs.
- CO3: Develop the codes containing looping and decision-making statements.
- CO4: Implement user defined functions.
- CO5: Apply recursion and call the function with appropriate parameters.
- CO6: Design and develop solutions to real world problems

SCSA2302	CODE OPTIMIZATION AND DEBUGGING - I	L	T	P	Credits	Total Marks
		0	0	2	1	100

COURSE OBJECTIVES

- To improve the intermediate code by making it consume fewer resources.
- To get the faster running machine code.
- To improve the consistency of the code.
- To enhance the readability of the code and easier code maintenance.
- To improve the work flow of the code.

SUGGESTED LIST OF EXPERIMENTS

1. Implement Built In Function and Libraries using python.
2. Implement Optimizing loop using python.
3. Profiling CPU usage using python.
4. Profiling memory usage using python.
5. Implement query optimization in DBMS.
6. Implement heuristics in query optimization in DBMS.
7. Implement factorial of given number using memorization in data structure.
8. Implement Divide and conquer method in data structure.
9. Implement hybrid stable sorting algorithm in data structure.
10. Implement linked list with improving the time complexity in data structure.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 - Understand importance of code optimization.
- CO2 - Apply time complexity and space complexity of the algorithm for improving optimization.
- CO3 - Analyze and appreciate variety of performance measures for various optimization problems.
- CO4 - Learn efficient computational procedures to solve optimization problems.
- CO5 - Be able to use programming languages to implement optimization algorithms.
- CO6 - Be able reduce the execution time of code by applying proper coding technique.

SIT1608	GREEN COMPUTING	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To study about existing green computing strategies
- Fundamental challenges in achieving green operations of computing units
- Assess enterprise-wide and personal computing and computing related energy consumption.

UNIT 1 GREEN COMPUTING FUNDAMENTALS 9 Hrs.

Green IT fundamentals: Business, IT, and the environment - Green computing: Carbon foot print - scoop on power - Green IT strategies: Drivers, Dimensions, and Goals - Environmentally responsible business: Policies, Practices and Metrics.

UNIT 2 GREEN ASSETS AND MODELING 9 Hrs.

Green Assets: Buildings, data centers, networks and devices - Green business process management: Modeling, optimization and collaboration - Green enterprise architecture - Environmental intelligence - Green supply chains - Green information systems: Design and development models.

UNIT 3 GRID FRAMEWORK 9 Hrs.

Virtualizing of IT systems - Role of electric utilities, telecommuting, teleconferencing and teleporting - Materials recycling - Best ways for green PC - Green data center - Green grid framework

UNIT 4 GREEN COMPLIANCE 9 Hrs.

Socio-cultural aspects of green IT - Green enterprise transformation roadmap - Green Compliance: protocols, standards and audits - Emergent carbon issues: technologies and future. The Way Climate Savers Computing Initiative Do - The Climate Savers Computing Initiative - What Green Computing Impact Organization Supplies - Green Computers Initiatives - Green Computing Impact Organization Overview - Green Electronics Council - Going Green Can Be Truly Challenging - The Green Grid Framework - The CSCI Top Secrets Revealed - The EPEAT Standards - To Have a Green Computer - Green Computing Means to Save Your Money and Your Business - Finances - Green Computing Initiative Platforms.

UNIT 5 CASE STUDIES 9 Hrs.

The Environmentally Responsible Business Strategies (ERBS) - Case study scenarios for trial runs - Case studies - Applying green IT strategies and applications to a home, hospital, packaging industry and telecom sector.

Max.45 Hours

TEXT / REFERENCE BOOKS

- Bhuvan Unhelkar, "Green IT Strategies and Applications - Using Environmental Intelligence", CRC Press, June 2011.
- Woody Leonhard, Katherrine Murray, "Green Home computing for dummies", August 2009. Warland & Pravin Variaya, "High Performance Communication Networks", Jean Harcourt Asia Pvt. Ltd., II Edition, 2001.
- Jason Harris, "Green Computing and Green IT - Best Practices on regulations & industry", Lulu.com, 2008.
- Alin Gales, Michael Schaefer, Mike Ebbers, "Green Data Center: steps for the Journey", Shoff/IBM rebook, 2011.
- John Lamb, "The Greening of IT", Pearson Education, 2009.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max Marks : 80

PART A : 10 questions of 2 marks each - No choice -

PART B : 2 questions from each unit with internal choice, each carrying 12 marks

Exam Duration: 3 Hrs.

20 Marks

80 Marks

SIT1612	CYBER FORENSICS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- Demonstrate a working knowledge of computers, storage devices, and digital data
- Plan and prepare for an incident requiring computer forensic skills
- Seize a computer from a crime scene without damaging it or risking it becoming inadmissible in a court of law

UNIT 1 INTRODUCTION TO COMPUTER FORENSICS 9 Hrs.

Computer Forensics Fundamentals: What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement - Computer Forensic Technology - Types of Business Computer Forensic Technology Computer Forensics Evidence and Capture: Data Recovery Defined - Data Back-up and Recovery - The Role of Back-up in Data Recovery - The Data - Recovery Solution

UNIT 2 MOBILE AND SMART PHONE FORENSICS 9 Hrs.

Introduction to Mobile Malware : Types of Attacks Taxonomy of Mobile Malware, Phishing, SMishing, and Vishing Malware Attack and Defense : Mobile Malware, Visual Payloads, Timeline of Mobile Malware, Hoaxes, and Threats, Overview of Mobile Malware Families, Taxonomy of Mobile Malware Threats, Hacking and Viruses in Mobile :Introduction and Overview of Mobile Communication, Attacks in Mobile, Man in the Middle, Denial of Service, Wireless Spoofing, Prevention Techniques in Mobile System, Intrusion detection in wireless, Access Control and Authentication in Mobile

UNIT 3 NETWORK SECURITY 9 Hrs.

IPSec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPSec . Transport layer Security: SSL protocol, Cryptographic Computations - TLS Protocol.SIM Security, Security of Mobile Networks, Security of GSM Networks, Security of 3G Networks, Security of Wireless Local Area Networks, Security of Ad-hoc Networks, Security Techniques for Mobile Services, End-to-End Security Services in Mobile Communications, Inter-system Roaming and Internetworking Security, Securing Mobile E-Services, Security of Satellite Services, Security of Mobile Sensor Networks, Application Level Security, Security of IP Based Applications, Security of Mobile Payments, Security of Multimedia Communications, Security of Mobile Voice Communication

UNIT 4 EVIDENCE COLLECTION AND FORENSICS TOOLS 9 Hrs.

Forensics - Investigating Dead Virtual Environments Install Files, Remnants, Registry, Microsoft Disk Image Formats, Data to Look for, Investigator Tips Forensics - Investigating Live Virtual Environments: Artifacts, Processes and Ports, Log Files, VM Memory Usage, Memory Analysis, ESXi Analysis, Microsoft Analysis Tools Processing Crime and Incident Scenes - Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools.

UNIT 5 ANALYSIS AND VALIDATION 9 Hrs.

Current Computer Forensic tools: evaluating computer forensic tool needs, validating and testing forensics software computer forensics hardware tools, validating and testing forensics software Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

Max. 45 Hours

TEXT / REFERENCE BOOKS

1. Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003.
2. Nelson, Phillips, Einfinger, Steuart, "Computer Forensics and Investigations", Cengage Learning, India Edition, 2008
3. John R.Vacca, "Computer Forensics", Cengage Learning, 2005.
4. Richard E.Smith, "Internet Cryptography", 3rd Edition Pearson Education, 2008.
5. Marjie T.Britz, "Computer Forensics and Cyber Crime": An Introduction", 3rd Edition, Prentice Hall, 2013.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration: 3 Hrs.

PART A: 10 questions of 2 marks each - No choice

20 Marks

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks

80 Marks

S I T 1 6 0 4	VIRTUALIZATION TECHNIQUES	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

OS-level and language-level virtual machines.Virtual networking, Virtual machine mobility, Virtualization for cloud and grid computing, Virtualization for distributed system security.Virtualization for autonomic service provisioning and power management.

UNIT 1 OVERVIEW OF VIRTUALIZATION

8 Hrs.

Basics of Virtualization - Virtualization Types - Desktop Virtualization - Network Virtualization - Server and Machine Virtualization - Storage Virtualization - System-level or Operating Virtualization - Application Virtualization - Virtualization Advantages - Virtual Machine Basics - Taxonomy of Virtual machines - Process Virtual Machines - System Virtual Machines - Hypervisor - Key Concepts

UNIT 2 SERVER CONSOLIDATION

8 Hrs.

Hardware Virtualization - Virtual Hardware Overview - Server Virtualization - Physical and Logical Partitioning - Types of Server Virtualization - Business cases for Server Virtualization - Uses of Virtual server Consolidation - Planning for Development - Selecting server Virtualization Platform

UNIT 3 NETWORK VIRTUALIZATION

10 Hrs.

Design of Scalable Enterprise Networks - Virtualizing the Campus WAN Design - WAN Architecture - WAN Virtualization - Virtual Enterprise Transport Virtualization - VLANs and Scalability - Theory Network Device Virtualization Layer 2 - VLANs Layer 3 VRF Instances Layer 2 - VFI's Virtual Firewall Contexts Network Device Virtualization - Data - Path Virtualization Layer 2: 802.1q - Trunking Generic Routing Encapsulation - IPsec L2TPv3 Label Switched Paths - Control - Plane Virtualization - Routing Protocols - VRF - Aware Routing Multi-Topology Routing.

UNIT 4 VIRTUALIZING STORAGE

10 Hrs.

SCSI - Speaking SCSI - Using SCSI buses - Fiber Channel - Fiber Channel Cables - Fiber Channel Hardware Devices - iSCSI Architecture - Securing iSCSI - SAN backup and recovery techniques - RAID - SNIA Shared Storage Model - Classical Storage Model - SNIA Shared Storage Model - Host based Architecture - Storage based architecture - Network based Architecture - Fault tolerance to SAN - Performing Backups - Virtual tape libraries.

UNIT 5 VIRTUAL MACHINES PRODUCTS

9 Hrs.

Xen Virtual machine monitors - Xen API - VMware - VMware products - VMware Features - Microsoft Virtual Server - Features of Microsoft Virtual Server.

Max. 45 Hours

TEXT / REFERENCE BOOKS

William von Hagen, Professional Xen Virtualization, Wrox Publications, January, 2008.

Chris Wolf, Erick M. Halter, Virtualization: From the Desktop to the Enterprise, APress 2005

Kumar Reddy, Victor Moreno, Network virtualization, Cisco Press, July, 2006.

James E. Smith, Ravi Nair, Virtual Machines: Versatile Platforms for Systems and Processes, Elsevier/Morgan Kaufmann, 2005.

David Marshall, Wade A. Reynolds, Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center, Auerbach Publications, 2006.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Understand about Computing Virtualization tools, applications and techniques.

CO2 – Deploy hypervisors and demonstrate hypervisor compatibility and configuration.

CO3 – Create a virtual machine and install a guest OS and management tools.

CO4 – Identify the components of virtual networking, create virtual switches and manage VLANs.

CO5 – Configure storage at the hypervisor and VM layer.

CO6 – Demonstrate and understanding of different components of the virtual machine products.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100 Exam Duration : 3 Hrs.

PART A: 10 questions of 2 marks each - No choice - 20 Marks

PART B : 2 Questions from each unit with internal choice, each carrying 12 marks 80 Marks