॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

Fax : (02462) 215572

Phone: (02462)215542

Academic-1 (BOS) Section

website: srtmun.ac.in

E-mail: bos@srtmun.ac.in

विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील खालील विषयाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२४–२०२५ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबधितांना कळविण्यात येते की, प्रस्तुत विद्यापीठाच्या संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील C.B.C.S. (Choice Based Credit System) Pattern नुसारचे खालील अभ्यासक्रम शैक्षणिक वर्ष २०२४–२५ पासून लागू करण्यास मा. विद्या परिषदेच्या दिनांक १५ मे २०२४ रोजीच्या बैठकीतील ठराव क्रमांक १५/५९–२०२४ अन्वये मान्यत प्रदान केली आहे.

1. B.Sc. Computer Maintenance II year

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या www.srtmun.ac.in या संकेतस्थळावर उपलब्ध आहे. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शैक्षणिक– /०१/परिपत्रक/UG/
पदवी–सीबीसीएस अभ्यासक्रम/२०२४–२५/968
दिनांक : २४.०७.२०२४

आपली विश्वासू
डॉ. सरिता लोसरवार
सहाय्यक कुलसचिव

प्रत माहिती व पुढील कार्यवाहीस्तव :

१) मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. यांना देवून कळवण्यात येते की, सदरील परिपत्रक विद्यापीठाच्या संकेतस्थळावर प्रसिध्द करण्यात यावे.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

CHOICE BASED CREDIT SYSTEM (CBCS)

SEMESTER PATTERN

Faculty of Science & Technology

Syllabus of B.Sc. Second Year Computer Maintenance (Optional)

(w. e. f. Academic Year 2024-2025)

Year/ Sem	Code	Paper	Title of Paper	Periods /Week	Credit	Exam Hrs.	Marks		
							Ext.	Int.	Tot.
Sem-III	OCM-201	VI	PC Installation & Networking	03	02	02	40	10	50
	OCM-202	VII	Programming in C++	03	02	02	40	10	50
	OCM-204	SEC-I	Skill Enhancement Course-I: A) Office Automation OR B) Introduction to Multimedia	03	02	02	25	25	50
Sem-IV	OCM-205	VIII	Networking & LAN Maintenance	03	02	02	40	10	50
	OCM-206	XI	Programming in Java	03	02	02	40	10	50
	OCM-208	SEC-II	Skill Enhancement Course-II: A) Web Applications OR B) Digital Media	03	02	02	25	25	50
Annual	OCM-203	X	Practical Based on Theory Papers VI and VII.	04	02	03	40	10	50
	OCM-207	XI	Practical Based on Theory Papers VIII and XI.	04	02	03	40	10	50
Total				26	16		290	110	400

Theory: Paper No.VI

PC Installation & Networking

Course Code: OCM-201 **[Marks: 50 Total Periods: 45]**

Course Objectives:

The course is designed to build practical skills in Assembling & maintenance of the personal desktop computer, installation of operating system and software's as well as to setup the network.

Course Outcome:

Students would have knowledge of computer hardware and peripherals, their installation, PC assembly, trouble shooting.

Unit I:
Study of computer devices: Keyboard, Mouse, Monitor, RAM, Hard Disk, CD Drive, Motherboard, SMPS, Pen Drive

Unit II:
Installation of Windows OS on a Computer, Using System Tools: disk clean up, disk defragmentation, Antivirus Software

Unit III:
Windows OS Administration: Creating User, Installing/Uninstalling programs, copy files & folders, Creating a CD, Formatting Pen Drives,

Unit IV:
Installing printer, Connecting to LAN, Using Printer in LAN, Sharing Files on LAN Connecting to Internet, Browsing web sites, creating an E-mail account, Downloading contents from Internet

Text/References Books:

1. Computer Installation & Servicing by D Balsubrmaniyam, McGraw Hill Pub.
2. PC : Repair & Maintenance a practical guide by J Rosenthal, K Irwin
3. Easy PC Maintainance & Repair by Philip Laplante, McGraw Hill Pub.

Theory: Paper No. VII

Object Oriented Programming using C++

Course Code: OCM-202 **[Marks: 50 Total Periods: 45]**

Course Objectives:

1. To understand how C++ improves C
2. To learn OOPS concepts
3. To learn how to design C++ classes for code reuse.

Course Outcome:

Upon compilation of this course, students will able to do programming independently and will also be able to built small applications.

Unit I: **Periods: 10**

Basic Concepts of OOP, Object Oriented Languages, Applications of OOP, Structure of C++ program. Difference between Top down & bottom up language.

Unit II: **Periods: 15**

Introduction to Tokens, Keywords, Identifiers & Constants, Basic Data Types, Variables Operators in C++, Decision Control & Loop Control Structures: If, If-else, Nested If, Else-if ladder, switch, goto Statement, break statement, while, do-while, for loop.

Unit III: **Periods: 10**

Introduction to Function, Function Prototyping, Call by Value & Call by reference, inline function, default arguments, Function Overloading, Library Functions

Unit IV: **Periods: 10**

Introduction Structures, specifying a Class, Defining member functions, Static Data Members, Static Member Functions, Friend Functions. Introduction to Constructors, destructors. Introduction to Inheritance.

Text/Reference Books:

1. Object-Oriented Programming with C++ -E-Balgurusamy
2. The C++ Complete Reference -TMH Publication
3. Object Oriented Programming in C++ by Robert Lafore

Paper No. SEC-I

Skill Enhancement Course-I:

A) Office Automation
OR
B) DTP & Multimedia

Course Code: OCM-204 **Marks: 50 Total**

Skill Enhancement Course-I: 204 (A) Office Automation

Course Objectives:

The main objective of Office Automation is to enhance and upgrade the existing system by increasing its efficiency and effectiveness. It will simplify the task and reduce the paper work means the software improves the working methods by replacing the existing manual system with the computer-based system.

Course Outcome:

After completion of this course student will be able to understand the computer software, hardware, made available to simplify and automate a variety of office operations such as data processing, data manipulating and data presentation with various application those are presents in Microsoft office tools packages.

Unit I

1. Introduction to MS-Word.
    - 1.1 Word 2010 Basics: - Opening screen of MS-word,
    - 1.2 Home menu- font tab,
    - 1.3 Paragraph tab,
    - 1.4 Styles tab
    - 1.5 Editing options in MS-Word
    - 1.6 Insert menu- table tool
    - 1.7 Header and Footer tool
    - 1.8 Mail-merge
    - 1.9 Custom dictionary
    - 1.10 Printing in MS-Word
    - 1.11 Creating Index in MS-Word.

Unit II

2. Working with MS-Excel.
    - 2.1 Introduction to MS-Excel
    - 2.2 Formatting cells
    - 2.3 Formatting columns
    - 2.4 Row height
    - 2.5 Merging

2.6 Splitting columns and connecting the worksheets
2.7 Working with Formulas and Functions
2.8 Creating charts
2.9 Goal seek
2.10 Data validation
2.11 Conditional Formatting.

Unit III

3. Working with Microsoft power point.
   3.1 Opening Screen of MS PowerPoint
   3.2 Creating a new presentation based on template
   3.3 Design template and blank presentation
   3.4 Slide Transition
   3.5 Custom Animation effects
   3.6 Slide show
   3.7 Adding audio and video on slides.

Unit IV

4. Introduction to MS-Access.
   4.1 Opening screen of MS-Access
   4.2 Advantages and disadvantages of MS-Access
   4.3 Performing Queries
   4.4 Generating the report
   4.5 Creating the database in Access
   4.6 Creating forms and adding new records in MS-Access.

References:-

1. MS-DOS 6.22 by Russell A Stultz BPB publication.

OR
Skill Enhancement Course-I:

204 (B) Introduction to Multimedia

Course Code: OCM-205 **Marks: 50**

Objective

Multimedia is content that uses a combination of different content forms such as text, audio, images, animations, video and interactive content. Multimedia contrasts with media that use only rudimentary computer displays such as text-only or traditional forms of printed or hand-produced material.

Outcomes

Student will learn the different content forms of Multimedia such as text, audio, images, animations, video and interactive content.

UNIT I

1. Introduction to Multimedia
    - 1.1 Introduction to Multimedia
    - 1.2 Definition of Multimedia elements
    - 1.3 Multimedia Elements
    - 1.4 Multimedia Applications
    - 1.5 Global structure of Multimedia
    - 1.6 Data Compression
    - 1.7 Basic compression techniques (Run length & Huffman encoding)
    - 1.8 Introduction to compression techniques: JPEG, MPEG

UNIT II

2. Optical Storage Media & Audio File Formats
    - 2.1 Optical Storage Media & Retrieval Technologies
    - 2.2. Basic Technology
    - 2.3 Video Disk & other WORMS
    - 2.4 CD-ROM and Multimedia Highway
    - 2.5 DVD- ROM
    - 2.6 Basic Concept of Sound
    - 2.7 MIDI
    - 2.8 Digital audio
    - 2.9 Audio file formats

UNIT II

3. Image and Graphics
    - 3.1 Making Still Images: BITMAPS, Vector Drawing
    - 3.2 Image Formats
    - 3.3 Graphics Format
    - 3.4 Image file format: BMP, JPEG, TIFF, PNG

UNIT IV

4. Video & Animation

4.1 Basic concepts of Video

4.2 Broadcast Video Standards

4.3 Television: Conventional systems, Enhanced definition systems, High Definition system

4.4 Computer based Animation

Reference Books:

1. Multimedia System Design By By P. K. Andleigh, Kiran Thakrar, Dhanpat Rai Publications

2. Multimedia : Computing Communications & Applications, By Ralf Steinmetz And Klara Nehrstedt, Pearson Education

Theory: Paper No. VIII

Networking & LAN Maintenance

Course Code: OCM-205 **[Marks: 50 Total Periods: 45]**

Course Objectives:
Understanding basics of computer networking, connectivity techniques and related protocols. This introduces the students to computer networks and concentrate on building a firm foundation for understanding data communication.

Course Outcome:
Students would be able to chose, escalate and establish a computer network

Unit I: Introduction to Computer Networks **Periods: 15**

- Computer Network Definition & Applications
  - What is a computer network?
  - Common applications of computer networks in different fields (business, education, healthcare, etc.)

- Data Transmission Modes
  - Simplex, Half-duplex, Full-duplex

- Protocol Hierarchies
  - Layered approach to network design
  - Design issues for each layer

- Connection-Oriented & Connectionless Services
  - Differences between connection-oriented and connectionless services
  - Examples of each type

- Service Primitives
  - Basic operations (send, receive, connect, disconnect, etc.)

- Network Models
  - OSI/ISO Reference Model
  - TCP/IP Model

Unit II: Network Topologies and Devices **Periods: 10**

- Network Topologies
  - Bus, Star, Ring, Mesh, Tree, Hybrid topologies
  - Advantages and disadvantages of each topology

- Network Devices
  - NIC Cards: Function and types
  - Hub: Function and usage

- Switch: Function and types
- Bridges: Function and usage
- Wireless Access Points: Function and usage
- Router: Function and types
- Gateways: Function and usage
- Modems: Function and types
- Repeaters: Function and usage

- Types of Networks
  - LAN, MAN, WAN, PAN, VPN

Unit III: Transmission Media and Communication **Periods: 10**

- Transmission Media
  - Magnetic Media: Types and usage
  - Twisted Pair: Types (UTP, STP) and usage
  - Co-axial Cable: Types and usage
  - Fibre Optics: Types and usage
  - Radio Transmission: Types and usage
  - Wireless Transmission: Types and usage
  - Bluetooth: Technology and applications

- Structure of Telephone System
  - PSTN, ISDN

- Transmission & Switching
  - Circuit Switching, Packet Switching

- Email Architecture
  - Components and protocols (SMTP, POP3, IMAP)

Unit IV: Network Protocols and Security **Periods: 10**

- Network Protocols
  - Overview and examples (HTTP, FTP, SMTP, etc.)

- Web Server and Browsers
  - Function and types of web servers
  - Role of web browsers in accessing network resources

- Domain Name System (DNS)
  - Function and structure
  - Importance in network communication

- Introduction to IP Addresses & IP Protocol
  - IPv4 and IPv6 addressing
  - Basics of IP protocol

- Introduction to Wi-Fi & 4G Technology
  - Basics of Wi-Fi technology
  - Overview of 4G technology

- Introduction to Security & Cryptography
  - Basic concepts of network security
  - Introduction to cryptographic techniques

- Firewall
  - Types and functions of firewalls
  - Importance in network security

-Network Maintenance
  -Routine maintenance tasks (software updates, hardware checks, etc.)
  -Network monitoring and troubleshooting
  -Backup and recovery procedures
  -Performance tuning and optimization
  -Documentation and change management in networks

Text/Reference Books:

1. Computer Networks by Andrew S Tanenbaum (PHI) 4th edition
2. Computer Networking & Internet by Fred Halsall, Addison Wesley
3. Computer Networks – A Systems approach by Peterson MK Publishers

Theory: Paper No. IX

Java Programming

Course Code: OCM-206 **[Marks: 50 Total Periods: 45]**

Course Objectives:

1. To learn why Java is useful for the design of desktop and web applications.
2. To learn how to implement object-oriented designs with Java.
3. To identify Java language components and how they work together in applications.

Course Outcome:

On completion of the course the student would be able to use Java integrated development environment to write, compile, run, and test simple object-oriented Java programs. Further, they would be able to make elementary modifications to Java programs that solve real-world problems.

Unit I: **Periods: 10**

Java Features, how java differs From C and C++, Java and Internet, Java & www, Web Browsers, Java support systems, JVM, Java program structure,

Unit II: **Periods: 10**

Java Tokens, Constants, Variables, Data Types, Declaration of variable, Giving Values to variables, Scope of Variables, Symbolic Constants, Command Line Arguments, Java Statements, simple java program,

Unit III: **Periods: 15**

Introduction & defining a class, adding variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors. Method Overloading, Static Members, Inheritance: Extending a class, Overriding Method, Final variable and Methods.

Unit IV: **Periods: 10**

Introduction, Defining Interface, Extending Interface, Implementing Interface, Accessing Interface Variables, Introduction to Arrays. Introduction to Java API package.

Text/Reference Books:

1. Programming with Java - A primer-By E. Balagurusamy (Tata Me Graw Hill)
2. Java 2 Complete Reference
3. Java How to program by Deitel

Paper No. SEC-II
Skill Enhancement Course-II:

(A) Introduction to Web Applications
OR
(B) Digital Media Concepts

Course Code: OCM-208 **[Marks: 50]**

Skill Enhancement Course-II: 208 (A) Introduction to Web Applications

Course Objectives:

The course is designed to build practical skills of development of web applications. Learn how to setup a quick and easy website with the new free Google sites.

Course Outcome:

Knowledge of website development and design specialization

Unit I
What is Web? Internet, what is mean by web site?

Unit II
Create a site, change your Sites Appearance, change your Site's Layout, create a Page, Create and Edit Page Templates, Track visitors to your site, Report abuse and illegal activity.

Unit III
Add text, images, or links, create custom page layouts or gadgets, add a Google Group on your website, use scripts to do tasks on your site.

Unit IV
Attach files from your computer, Link to files or text within your site, insert calendars, maps, Google Drive files and gadgets, share your site with other people, Change your site's homepage and search, Comment on a page.

Text/Reference Books:

Google sites & Chrome for Dummies by R Teeter & K Barksdale.

OR
Skill Enhancement Course-II:

(B) Digital Media Concepts

Skill Enhancement Course-II: (B) Digital Media

Course Objective:

The course is designed to build practical skills in the creation and publication of digital technologies.

Course Outcome:
Student will be able to use essential skills for digital media

Unit I:
Presentation Software, Introduction to power point, Creating Presentation with power point, Introduction to Flash, Creating Presentation with flash

Unit II:
Blogging, Fundaments of blog, Common examples of Blog, Create a blog with multimedia content

Unit III:
Digital photography, Basics of Digital Photography, Camera and shooting, Digital image editing, Digital image management.

Unit IV:
Podcast, Fundaments of Podcast, Audio recording and editing, Publishing and hosting podcast, Social Media tools, Writing content for the web, Search engine optimization.

Text/References Books:

1. Digital Photography for dummies by Julie A King
2. Learning to use Powerpoint by A Bassant
3. Podcasting by Steve Shipside

Practical: Paper No. X

Practical's based on theory papers-VI & VII (PC Installation & Networking and C++)

Course Code: OCS-203 **[Marks: 50]**

Course Objectives:

1. Understand and identify the components and architecture of computer hardware.
2. Gain proficiency in installing, configuring, and maintaining operating systems and network connections.
3. To understand what a process is and how processes are synchronized and scheduled.
4. To understand different approaches to memory management. To understand how C++ improves C with object-oriented features.

Course Outcome:

Student will be able to understand the basic components of computer hardware, and the interactions among the various components. Students will demonstrate the ability to install and configure Windows OS, manage system tools, and establish network connectivity. Further, they will be able to independently program in C++ .

Practical's based on theory papers-VI & VII (PC Installation & Networking & C++)

At least 20 (10 from each paper) practical exercises based on following guidelines:

1. Study of Computer Devices
2. Installation of Windows OS
3. Using System Tools. (Run Disk Cleanup and Disk Defragmenter tools to optimize the hard drive)
4. Windows OS Administration (Create a new user account, install and uninstall software, and manage files and folders.)
5. Network and Internet Connectivity (Install a printer, connect to a Local Area Network (LAN), and configure printer sharing, Share a folder on the LAN, access it from another computer, connect to the internet, create an email account, and download a file.)

C++ Practical List

1. Simple C++ Programs
2. Program in C++ using decision control structures
3. Program in C++ using looping statements
4. Program in C++ using Switch Statement
5. Program in C++ using functions
6. Program in C++ using a function with default arguments
7. Program in C++ using a class and member function defined outside the class
8. Program in C++ using Multiple Constructors in a class
9. Program in C++ using Object as function arguments
10. Program in C++ using Operator overloading
11. Program in C++ to Overload Unary Minus (-) Operator
12. Program in C++ to demonstrate Different types of Inheritance
13. Program in C++ to demonstrate Multiple Inheritance
14. Program in C++ to demonstrate Single Inheritance
15. Program in C++ using Static Data Members
16. Program in C++ to Demonstrate Use of File

Practical: Paper No. XI

Practical's based on theory papers- VIII & IX (Networking & LAN Main. & Java)

Course Code: OCS-207 **[Marks: 50]**

Course Objectives:

1. To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications.
2. To learn why Java is useful for the design of desktop and web applications.

Course Outcome:

Students will gain expertise in some specific areas of networking such as the design and maintenance of individual networks. On completion of the course the student would be able to, use an integrated development environment to write, compile, run, and test simple object oriented Java programs.

Practical's based on theory papers- (Networking & LAN Main. & Java)

1. Network Setup
2. Configuring IP Addresses, Networking Commands, Setup Firewall & Configuration of Firewall, Server Configuration & services (Mail server etc)
3. Simple JAVA Programs
4. JAVA Programs using control structures
5. Program in JAVA using Two classes
6. Program in JAVA to demonstrate Command Line Arguments
7. Program in JAVA to demonstrate Method Overloading
8. Program in JAVA using Inheritance
9. Program in JAVA to Demonstrate Method Overriding
10. Program in JAVA using Interface
11. Program in JAVA using an Array
12. Program in JAVA to demonstrate String Methods
13. Program in JAVA using user Package
14. Program in JAVA using system package

15 Program in JAVA using constructors

16. Program in JAVA using Nesting of Methods