।। सा विद्या या विमुक्तये ।।

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

"ज्ञानतीर्थ" परिसर, विष्णुपूरी, नांदेड - ४३१६०६ (महाराष्ट्र)

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY NANDED

"Dnyanteerth", Vishnupuri, Nanded - 431606 Maharashtra State (INDIA)

Established on 17th September 1994 – Recognized by the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'A' Grade

ACADEMIC (1-BOARD OF STUDIES) SECTION

Phone: (02462) 229542
Fax : (02462) 229574

Website: www.srtmun.ac.in

E-mail: bos.srtmun@gmail.com

संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील द्वितीय वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०–२१ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, **दिनांक २० जून २०२० रोजी संपन्न झालेल्या ४७व्या मा. विद्या परिषद बैठकीतील विषय क्र.११/४७–२०२०**च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या **संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील द्वितीय वर्षाचे** खालील विषयांचे **C.B.C.S. (Choice Based Credit System) Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०–२१ पासून लागू करण्यात येत आहेत.

1. B.Sc.-II Year-Biophysics	2. B.Sc.-II Year-Bioinformatics
3. B.Sc.-II Year-Biotechnology	4. B.Sc.-II Year-Biotechnology (Vocational)
5. B.Sc.-II Year-Food Science	6. B.Sc.-II Year-Botany
7. B.Sc.-II Year-Horticulture	8. B.Sc.-II Year-Agro Chemical Fertilizers
9. B.Sc.-II Year-Analytical Chemistry	10. B.Sc.-II Year-Biochemistry
11. B.Sc.-II Year-Chemistry	12. B.Sc.-II Year-Dyes & Drugs Chemistry
13. B.Sc.-II Year-Industrial Chemistry	14. B.C.A. (Bachelor of Computer Application)-II Year
15. B.I.T. (Bachelor of Information Technology)-II Year	16. B.Sc.-II Year-Computer Science
17. B.Sc.-II Year-Network Technology	18. B.Sc.-II Year-Computer Application (Optional)
19. B.Sc.-II Year-Computer Science (Optional)	20. B.Sc.-II Year-Information Technology (Optional)
21. B.Sc.-II Year-Software Engineering	22. B.Sc.-II Year-Dairy Science
23. B.Sc.-II Year-Electronics	24. B.Sc.-II Year-Environmental Science
25. B.Sc.-II Year-Fishery Science	26. B.Sc.-II Year-Geology
27. B.Sc.-II Year-Mathematics	28. B.Sc.-II Year-Microbiology
29. B.Sc.-II year Agricultural Microbiology	30. B.Sc.-II Year-Physics
31. B.Sc.-II Year Statistics	32. B.Sc.-II Year-Zoology

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

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.: शैक्षणिक–१/परिपत्रक/पदवी–सीबीसीएस अभ्यासक्रम/२०२०–२१/**३३३**

दिनांक : १५.०७.२०२०.

स्वाक्षरित/–
उपकुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :
१) मा. कुलसचिव यांचे कार्यालय, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.

Swami Ramanand Teerth Marathwada University, Nanded
(NAAC Re-accredited with 'A' Grade)

Syllabus of

Second Year B.Sc. Optional Computer Application
(Revised CBCS pattern)

Introduced from Academic Year 2020-21

B.Sc. Optional Computer Application

B.Sc. Optional Computer Application (3years) program / degree is a general B.Sc. program where students opt Computer Application as one of the optional subject. It builds the student on studies in Computer Application tools and techniques and to become competent in the current race and development of new software. The duration of the study is of six semesters, which is normally completed in three years.

CBCS pattern

The B.Sc. Optional Computer Application program as per CBCS (Choice based credit system) pattern, in which choices are given to the students under open electives and subject electives. The students can choose open electives from the wide range of options to them.

Eligibility and Fees

The eligibility of a candidate to take admission to **B.Sc. Optional Computer Application** program is as per the eligibility criteria fixed by the University. More details on admission procedure and fee structure can be seen from the prospectus of the college / institution as well as on website of the University.

Credit Pattern

Every course has corresponding grades marked in the syllabus structure.

The credit pattern is similar to other optional subjects like Physics, Mathematics, Chemistry, etc.

The Grading pattern to evaluate the performance of a student is as per the University rules.

=====000===000======000===

The detailed syllabus structure is as belwo,

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

CHOICE BASED CREDIT SYSTEM (CBCS)

SEMESTER PATTERN

Faculty of Science & Technology

Under Graduate (UG) Program

Curriculum of B. Sc. Second Year Computer Application (Optional)

(W. E. F. Academic Year 2020-2021)

Year/ Sem	Code	Paper	Title of Paper	Periods /Week	Credit	Exam Hrs.	Marks		
							Ext.	Int.	Tot.
Sem-III	OCA-201	VI	Relational Database Management System	03	02	02	40	10	50
	OCA-202	VII	Java Programming	03	02	02	40	10	50
	OCA-204	SEC-I	Skill Enhancement Course-I: A) Programming using SCILAB OR B) PC Installation & Networking	03	02	02	25	25	50
Sem-IV	OCA-205	VIII	Computer Networks	03	02	02	40	10	50
	OCA-206	IX	Programming Using Python	03	02	02	40	10	50
	OCA-208	SEC-II	Skill Enhancement Course-II: A) Introduction to Web Applications OR B) Digital Media Concepts	03	02	02	25	25	50
Annual Practicals	OCA-203	X	Practical's based on theory papers- VI & VII (RDBMS and Java)	04	02	03	40	10	50
	OCA-207	XI	Practical's based on theory papers- VIII & IX (CN & Python)	04	02	03	40	10	50
Total				26	16		290	110	400

Note: A Practical group/ batch for practical papers are recommended to have 10-15 students as per the SRTMUN and UGC Guidelines under CBCS (Choice Base Credit System).

Theory: Paper No.VI
Relational Database Management System

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

Course Objectives:
The objective of this course is to expose the students to the fundamentals & basic concepts in relational Data Base Management Systems. This course discusses architecture of Database Systems with concept of relational model & ER model.

Course Outcome:
Upon successful completion of this course, students should be able to: Describe the fundamental elements of relational database management systems, Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

Unit I: **Periods: 15**
Basic Concepts: Data Modelling for a database, Records and files, Three level architecture, Components of DBMS, Advantages and disadvantages**,** A Brief Review of Set theory, Relational Database, Physical Implementation Issues

Unit II: **Periods: 10**
Data Models: Introduction, Data Associations, Data model's classification, Entity Relationship Model, Relational Data Model, Network Data Model.

Unit III: **Periods: 10**
SQL Introduction: Basic Structure, Set Operations, Aggregate functions, Null Values, Nested sub queries, Derived Relations, Views, Modification of database, Joined relations, Data Definition Language, Embedded SQL.

Unit IV: **Periods: 10**
Pitfalls in Relational Database Design, Decomposition, Normalization using functional Dependencies, Centralized Systems, Client Server Systems, Parallel Systems, Distributed Systems

Text/Reference Books:

1. An Introduction to Database Systems by Bipin Desai (Galgotia Publications)
2. Database System Concepts By Abraham Silberschatz and Henry F Korth (McGraw Hill) 4th Edition.

Theory: Paper No. VII
Java Programming

Course Code: OCA-202 **[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-I
Skill Enhancement Course-I:

A) PROGRAMMING USING SCILAB

OR

B) NETWORKING CONCEPTS

Course Code: OCA-204 **[Marks: 50]**

Course Objectives:
To learn basic functioning in SCILAB.

Course Outcome:
Students will be able to understand the main features of the SCILAB program development environment, to implement simple mathematical functions/equations in numerical computing environment such as SCILAB.

Skill Enhancement Course-I: 204 (A) PROGRAMMING USING SCILAB

Unit I:
Why Scilab, Capabilities of Scilab package, benefits of shifting to scilab

Unit II:
Installing and tuning

Unit III
Getting Started, Expressions: Show mathematical expressions with numbers, Variables, Diary command, Define symbolic constants, Basic functions, suppressing output (;), help, etc.

Unit IV:
Vector Operations, Define vector, Calculate length of a vector, Perform mathematical operations on Vectors such as addition, subtraction and multiplication, Define a matrix, Calculate size of a matrix, Perform mathematical operations on Matrices such as addition, subtraction and multiplication

Text/References Books:
1. Engineering & Scientific Computing with MATLAB by C. Gomez
2. SCILAB by A.S. Nair Online References:
3. www.spoken-tutorial.org

OR

Skill Enhancement Course-I:

204 (B) PC Installation & Networking

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. VIII
Computer Networks

Course Code: OCA-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: **Periods: 15**
Computer Network definition & Applications, Data Transmission Modes, Protocol Hierarchies, Design issues for layers, Connection Oriented & Connectionless services. Service Primitives. Network Models – OSI/ISO Reference Model & TCP/IP Model.

Unit II: **Periods: 10**
Network Topologies, Network Devices - NIC Cards, Hub, Switch, Bridges, Wireless access points, Router, Gateways, Modems, Repeaters, Types of Networks.

Unit III: **Periods: 10**
Magnetic Media, Twisted pair, Co-axial cable, fibre optics, radio transmission, Wireless transmission, Bluetooth. Structure of telephone system, Transmission & Switching. Email Architecture,

Unit IV: **Periods: 10**
Network Protocols, Web server, Browsers, Domain Name System, introduction to IP addresses & IP Protocol, Introduction to Wi-Fi & 4G technology, Introduction to Security & Cryptography, Firewall.

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
Programming using Python

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

Course Objectives:

1. To understand why Python is a useful scripting language for developers.
2. To learn how to design and program Python applications.
3. To learn how to use lists, tuples, and dictionaries in Python programs.

Course Outcome:

Students would have proficiency in the handling of strings and functions.

Unit I: **Periods: 15**

Introduction to Python and Basic Concepts in python Introduction to python: What is python? Applications of Python, Installation of python, First program in Python, Comments and Docstrings in Python. Variable and data types, Operators in python. File Handling, working with open, read, write, append modes of file Conditional Statements: Indentation in python, if, if-else, nested if-else statements

Unit II: **Periods: 10**

Looping Statements, Control statements, String Manipulations Looping Statements: for loop, while loop, Nested loops Control Statements: break, continue and pass String Manipulations: Accessing strings, Basic operations, String slices, Functions and methods

Unit III: **Periods: 15**

Python collections : list, Tuple, set and dictionary List: Introduction, Accessing lists, change item value in list, loop through list, methods Tuple: Introduction, Accessing tuples, change item value in tuple , loop through tuple and methods of tuple Set: introduction and methods of set Dictionary, Introduction, Accessing values in dictionaries, properties, Change value in dictionary, loop through dictionary and methods of

Unit IV: **Periods: 15**

Functions, Data visualization in python Functions: Defining a function, Calling a function, Function arguments, Default parameter value, Anonymous function, Lambda function. Data visualization in python: Pandas packages (NumPy and matplotlib libraries).

Reference Books:

1. Introducing python - Bill Lubanovic
2. Machine Learning (in Python and R) For Dummies - John Paul Mueller
3. Core Python Programming – Dr. R.Nageswara Rao.
4. Python Cookbook – David Ascher,AlexMartelli

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

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

Course Code: OCA-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: OCA-208 (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 optimisation.

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 (RDBMS and Java)

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

Course Objectives:
The objective of this course is to expose the students to the fundamentals & basic concepts in Relational Data Base Management Systems. Further, to understand Java object-oriented features.

Course Outcome:
Upon successful completion of this course, students should be able to describe the fundamental elements of relational database management systems including relational data model, entity-relationship model, relational database design, relational algebra and SQL. They will also be able to design and develop Internet Programming using Java.

Practical's based on theory papers-VI & VII (RDBMS & Java)

At least 20 (10 from each paper) practical exercises based on following guidelines:
What is SQL? Types of SQL Commands
Creating Tables & Retrieving, Manipulating Data from tables
Study of Operators
Study of SQL Functions

Java
1. Simple JAVA Programs
2. JAVA Programs using control structures
3. Program in JAVA using Two classes
4. Program in JAVA to demonstrate Command Line Arguments
5. Program in JAVA to demonstrate Method Overloading
6. Program in JAVA using Inheritance
7. Program in JAVA to Demonstrate Method Overriding
8. Program in JAVA using Interface
9. Program in JAVA using an Array
10. Program in JAVA to demonstrate String Methods
11. Program in JAVA using user Package
12. Program in JAVA using system package
13 Program in JAVA using constructors
14.Program in JAVA using Nesting of Methods

Practical: Paper No. XI
Practical's based on theory papers- VIII & IX (CN & Python)

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

Course Objectives:
To develop an understanding of computer networking basics. To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications. Further,, the second part, is designed to provide basic knowledge of Python environment and programming.

Course Outcome:
Expertise in some specific areas of networking such as the design and maintenance of individual networks. Knowledge and implementation of modular approach using python, python libraries, etc

Practical's based on theory papers- (CN & Python)

1. Network Setup,
2. Configuring IP Addresses, Networking Commands, Setup Firewall & Configuration of Firewall, Server Configuration & services (Mail server etc)

Python

1.Hello world program in python
2. Python Program to Check Whether a Given Year is a Leap Year
3. Python Program to Check Whether a Number is Positive or Negative
4. Python Program to Take in the Marks of 5 Subjects and Display the Grade
5. Python Program to Check if a Number is a Palindrome
6. Python Program to Count the Number of Digits in a Number
7. Python Program to Find the Sum of Digits in a Number
8. Python Program to Print Odd Numbers Within a Given Range
9. Python Program to Find the Factorial of a Number
10. Python Program to check the number is prime or not
11. Python program to print hello world message using function
12. Python Program to Make a Simple Calculator using function
13. Python program to demonstrate lambda function