।। 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

25 1994 - 2019 SILVER JUBILEE YEAR

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 प्रथम वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, **दिनांक ०८ जून २०१९ रोजी संपन्न झालेल्या ४४व्या मा. विद्या परिषद बैठकीतील ऐनवेळचा विषय क्र.११/४४–२०१९** च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या **संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील प्रथम वर्षाचे** खालील विषयांचे **C.B.C.S. (Choice Based Credit System) Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्यात येत आहेत.

1. Agricultural Microbiology
2. Agrochemicals & Fertilizers
3. Analytical Chemistry
4. B.C.A.
5. B.Voc. (Food Processing, Preservation and Storage)
6. B.Voc. (Web Printing Technology)
7. Biochemistry
8. Bioinformatics
9. Biophysics
10. Biotechnology (Vocational)
11. Biotechonology
12. Botany
13. Chemistry
14. Computer Application (Optional)
15. Computer Science (Optional)
16. Computer Science
17. Dairy Science
18. Dyes and Drugs
19. Electronics
20. Environmental Science
21. Fishery Science
22. Food Science
23. Geology
24. Horticulture
25. Industrial Chemistry
26. Information Technology (Optional)
27. Mathematics
28. Microbiology
29. Network Technology
30. Physics
31. Software Engineering
32. Statistics
33. 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–०१/परिपत्रक/पदवी–सीबीसीएस अभ्यासक्रम/२०१९–२०/२९२
दिनांक : ०३.०७.२०१९.

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

B.Sc. Optional Computer Application
(3 years)
(Revised CBCS pattern)

Introduced from Academic Year 2019-20

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.

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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) Programmes

COMPUTER APPLICATION (OPTIONAL)

CURRICULUM

(W. E. F. Academic Year 2019-2020)

CLASS: B. Sc. COMPUTER APPLIACTION (Optional)

Year/ Sem	Code	Paper	Title of Paper	Periods /Week	Credit	Exam Hrs.	Marks		
							Ext	Int	Tot
Sem-I	OCA-101	I	Problem solving with Computers	03	02	02	40	10	50
	OCA-102	II	Web Page Designing using HTML	03	02	02	40	10	50
Sem-II	OCA-103	III	Programming With C	03	02	02	40	10	50
	OCA-104	IV	Introduction to Data Structures	03	02	02	40	10	50
Annual	OCA-105 (Lab)	V	Practical Based on Theory Papers II and III	03	04	03	80	20	100
Note: A Practical group/ batch for practical papers is recommended to have 10-15 students as per the SRTMUN and UGC Guidelines under CBCS (Choice Base Credit System)									

Theory: Paper No–I

Problem solving with Computers

Course Code: OCA-101 **[Marks: 50 Total Periods: 45]**

Course Objectives:

1. This *course aims* to introduce the classic *algorithms* in various domains,
2. Apply *algorithms* and design techniques *to solve problems*
3. Ability to analyze the performance of *algorithms*

Course Outcome:

1. Ability to choose appropriate *algorithm* design techniques for *solving problems*.
2. To design the *algorithms to solve* the programming *problems*.

Unit 1: Fundamentals of Computer (08 Periods)

Introduction to Computers, Block diagram of Computer, Characteristics of Computers, I/O Devices, I/O ports.

Unit 2: Problem Solving Aspects (08 Periods)

Introduction to Algorithm, Top Down Designing, Implementation of Algorithm, Analysis of Algorithm, Flowchart, Principals of Flowcharts, Flowcharts Symbols.

Unit 3: Fundamentals of Algorithms (08 Periods)

Exchanging value of variables, counting numbers, Summation of set of numbers, Factorial computations, Fibonacci number, Reverse of Digits.

Unit 4: Factoring Methods (05 Periods)

Finding square root of numbers, smallest divisor of integers, greatest common divisor, Generation of prime numbers, prime factor.

Unit 5: Array Techniques (08 Periods)

Introduction to Array, types of Array, Memory Representation of Array, Reverse of Array, Array counting, Finding maximum and minimum element from Array

Unit 6: Searching & Sorting Techniques (08 Periods)

Searching Techniques, linear search, binary search, Sorting Techniques:-bubble sort, selection sort.

Text book:

1. How to Solve it by Computer , Dromy R.J
2. Data Structure by Lipschutz Shaum Series

Reference Book:

1. Computer Fundamental by Anita Goel
2. Fundamentals of Computer by Dr. Bichkar & Dr. Sontakke

Theory: Paper No–II

Web Page Designing using HTML

Course Code: OCA-102 **[Marks: 50 Total Periods: 45]**

Course Objectives:

1. Develop skills in analyzing the usability of a *web site*.
2. HTML and CSS. Learn techniques of responsive web design
3. Basic knowledge in *HTML* tags & skill of *creating web pages*

Course Outcome:

1. Be able to use the *HTML* programming language. Resolves written *HTML* codes.
2. Be able to use the *Design* Programs.

(Marks: 50 Periods: 45)

Unit 1: Introduction to Web and Website (08 periods)

Introduction to Internet, Application and importance of Internet, www, URL, Web Browsers, web server, objectives of website, basic interface design, developing a story board for website, Navigation and links within website, checklist for designing.

Unit 2: Introduction to HTML (08 periods)

Introduction to HTML, Basic elements, List- ordered/ Numbered list, Unordered/ Bulleted list, Definition list, Nesting list, Linking HTML pages, linking to URL, Text Formatting, Text Alignment, Character Styles, Fonts and Font Sizes, Using colors for the Web, preformatted text, Horizontal line, line break, Displaying special characters.

Unit 3: Images in HTML (08 periods)

Images in HTML pages, Embedding inline images and external images, images and text alignment, images and links, alternative tags for images, using image as background, displaying images with heights and width dimensions, images preview, image for the

web, reducing file size of image file, decreasing the file size by reducing the colour depth of image file,

Unit 4: Tables in HTML (08 periods)

Introduction to tables, Features of tables, Tables in HTML, components of table, creating table, table cell and border, table and cell color,

Unit 5: Frames, Image Maps (08 periods)

Introduction to Frames, Creating frames, Frames attributes and linking of frames, complex framesets, Inline frames.

Unit 6: Forms and CGI Scripts (05 periods)

Introduction to forms, form design, text input fields, radio buttons, check box buttons, and submit button, additional layout features (select tag, Text AREA tag, and Hidden fields)

Reference books:

1. Web Publishing by Mnica D' Souza, Jude D' Souza (TMH Publication)
2. The complete reference HTML & CSS by T.A. Powell (TMH Publication)
3. HTML, DHTML, JavaScript, Perl CGI by IVAN Bayroos (BPB Publication)

Paper- III

Programming with C

Course Code: OCA-103 **[Marks: 50 Total Periods: 45]**

Course Objectives:

1. The *course* is designed to provide complete knowledge of *C* language.
2. Develop a greater understanding of the issues involved in. *programming* language design and implementation

Course Outcome:

1. Understand the fundamentals of *C programming*.
2. understating and to improve *C programming* skills.

Unit 1: Introduction to C (08 periods)

Introduction, Character set, C tokens, Data types, Constant, Variables, declaration of storage class, Input / Output Statement, operators, Hierarchy of Operation, Structure of C program.

Unit 2: The Decision and Looping, Control Structure (08 periods)

If Statement, If-Else statement, Nesting of If-Else, else-if ladder, Switch Statement, Go to.

While loop, Do-While loop, For loop.

Unit 3: Arrays and Pointers (08 periods)

Introduction to Array, One-dimensional arrays: Declaration & Initialization, Two-dimensional arrays: Declaration & Initialization, Multi-dimensional arrays, Introduction, understanding pointers, accessing address of variable, declaring pointer variables, initialization of pointer variable

Unit 4: Storage Classes (05 periods)

Automatic, Register, Static, Scope rules.

Unit 5: Functions (08 periods)

Introduction, Definition of function, return values and their types, function calls, function declaration, recursion, passing arrays to functions, What are string, Standard Library string functions: strlen(), strcpy(),strcmp(), strcat().

Unit 6: Structure and Union (08 periods)

Introduction, defining a structure, defining a structure variable, accessing structure members, initialization of structure, structure within structure, union

Reference Books:

1. C programming by B. Gottfried, Schaum's outline series
2. Programming in ANSI C by E. Balaguruswamy, TATA MCGRAW Hill Publication.
3. Let us C by Yeshwant Kanetkar, BPB Publication.
4. Programming in ANSI and Turbo C by Prof. Kamthane, Pearson Education.

Theory: Paper No –IV

Introduction to Data Structures

Course Code: OCA-104 **[Marks: 50 Total Periods: 45]**

Course Objectives:

1. To assess how the choice of **data structures** and algorithm design methods impacts the performance of programs
2. To solve problems using **data structures** such as linear lists, stacks, queues, hash tables, binary trees, heaps, binary search trees, and graphs and writing programs for these solutions.

Course Outcome:

1. Students develop knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, searching, and sorting of each data structure.
2. To impart the basic concepts of *data structures* and algorithms .

Unit-1: Role of Algorithms in Computing (08 periods)

Introduction, Algorithms as a technology, designing Algorithm, divide and conquer technique/ Approach

Unit-2: Introduction to Data Structure (08 periods)

Introduction, Elementary data organization, data structure operations, mathematical notations and functions, Algorithmic notations, control structure.

Unit-3: Linked List (08 periods)

Introduction, Representation of linked list in memory, Traversing, Searching, Unsorted link list, Inserting after given node, deleting node with a given item of information.

Unit-4: Stack and Queue (08 periods)

Introduction, Memory representation of Stack, Push and Pop operation

Queue: Introduction, Memory Representation, Insert & Delete operation.

Unit-5: Trees (08 Periods)

Introduction, Binary tree & it's Memory representation, Insertion & Deletion of nodes in binary tree, Threaded binary tree.

Unit-6: Graphs (05 periods)

Introduction, Memory Representation of graphs, types of graphs, Warshall's Algorithm.

Text Book:

1. Data Structure by Lipschtz
2. An Introduction to Data Structure with Application by Jean Paul
3. Introduction to Algorithms, Cormen Chatles E. Leiserson, PHI Edition.

Practical (Annual) Paper No. V

Course Code: OCA-105 (Lab) **[Marks: 100]**

Course Objectives:

1. Develop skills in analyzing the usability of a *web site*.
2. Develop a greater understanding of the issues involved in. *programming* language design and implementation

Course Outcome:

1. Be able to use the *HTML* programming language. Resolves written *HTML* codes.
2. Understand the fundamentals of *C programming*.

Laboratory Work based on Paper No. II & III

- At least 10 Practical's based on Theory Paper No. II
- At least 10 Practical's based on Theory Paper No.III