ACADEMIC (1-BOARD OF STUDIES) SECTION

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संलग्नत महाविद्यालयांतील विज्ञान व तंत्रज्ञान विधारणातील पदवी सर्वांगीत प्रथम वर्षाचे CBCS Pattern नुसार अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्याबाबत.

परिप्रेक्ष्य के

या परिप्रेक्ष्याचे सर्व संबंधितांचा कल्याणमय येते की, दिनांक ०८ जून २०१९ रोजी संपन्न झालेल्या ४४व्या माहिती परिषद बैठकातील ऐन्वेंट्रा विषय क्र.१९/४५–२०१९ न्या उद्योगानुसार प्रस्तुत विद्यापीठातील संलग्नत महाविद्यालयांतील विज्ञान व तंत्रज्ञान विधारणातील पदवी सर्वांगीत प्रथम वर्षाचे खालील विषयाचे C.B.C.S. (Choice Based Credit System) Pattern नुसार अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्याबाबत 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. Biotechnology
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

सदस्यीं परिप्रेक्ष्य ने अभ्यासक्रम प्रस्तुत विद्यापीठाचा www.srtmun.ac.in या संकेतस्थानावर उपलब्ध आहे की, तरी सदस्यीं या ही सर्व संबंधितांचा निर्देशनास आणून दाबी.

आ.प्र. परिषद,
विधायक, नंदन — ४३१ ६०६.
व.प्र.: शैक्षणिक—०९/परिषद/कवची—संबंधितांवा अभ्यासक्रम/
२०१९–२०/२९२

दिनांक : ०३.०७.२०१९.

प्रत्येक माहिती व पुढील कार्याचाहारात:
1) मा. कृत्यस्थित यांचे कार्यालय, प्रस्तुत विद्यापीठ.
2) मा. संपादक, पतन्त्र परिषद आणि मूल्यांकन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
3) प्राध्यापक, सर्व संबंधित संलग्नत महाविद्यालये, प्रस्तुत विद्यापीठ.
4) सहायक कृत्यसेवक, गटपटून विभाग, प्रस्तुत विद्यापीठ.
5) उपकृत्यसेवक, पातळी विभाग, प्रस्तुत विद्यापीठ.
6) सिस्टम एस्थान, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.
Syllabus of

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

Introduced from Academic Year 2019-20
B.Sc. Optional Computer Science

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

**CBCS pattern**

The **B.Sc. Optional Computer Science** 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 Science** 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) Program

### COMPUTER SCIENCE (OPTIONAL)

#### CURRICULUM

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

CLASS: B. Sc. COMPUTER SCIENCE (Optional)

<table>
<thead>
<tr>
<th>Year/Sem</th>
<th>Code</th>
<th>Paper</th>
<th>Title of Paper</th>
<th>Periods/Week</th>
<th>Credit</th>
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<td>Sem-I</td>
<td>OCS-101</td>
<td>I</td>
<td>Programming Logic Concepts</td>
<td>03</td>
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<td>OCS-102</td>
<td>II</td>
<td>Designing of Web Pages Using HTML</td>
<td>03</td>
<td>02</td>
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<tr>
<td>Sem-II</td>
<td>OCS-103</td>
<td>III</td>
<td>Introduction to Data Structure</td>
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<td>OCS-104</td>
<td>IV</td>
<td>Programming in C Language</td>
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<td>Annual</td>
<td>OCS-105</td>
<td>V</td>
<td>Practical Based on Theory Papers II and IV.</td>
<td>03</td>
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**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
Programming Logic Concepts

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

Course Objectives:
1. To develop understanding of problem solving using computers
2. To develop understanding of basic data structures such as arrays

Course Outcome:
1. Student will be able to design algorithms to solve different problems
2. Student will understand how to solve problems using computers

Unit-I: Periods: 15
Introduction, Generation of Computer, Classification of Computers, Hardware, Software, Applications of Computers, Computer Architecture: Central Processing Unit: Arithmetic Unit, Logic Unit, Control Unit, Main Memory Unit, Types of Memory, Input & Output Devices:

Unit–II Periods: 10
Introduction to Number systems, the problem solving aspects, top-down design, introduction to Algorithms, implementation of algorithms, the efficiency of algorithms, the analysis of algorithms, Flowchart and it’s symbols.

Unit –III Periods: 10
Exchanging the value of two variables, Counting, Summation of set of numbers, Factorial computation, Generation of the Fibonacci sequence, reverses the Digits of an Integer.

Unit-IV Periods: 10
The Smallest divisors of an integer, Generating prime numbers, Definition and Memory Representation of Array, Array order reversal, Array Counting , Finding the Maximum number in a set, sorting by exchange, Binary Search.

References Books:
2. How to Solve by it Computer, R.G.Dromey, Pearson.
3. Data Structure by Seymour Lipschtz, TMH Publication
Course Objectives:
1. Develop skills in analyzing the usability of a website.
2. Understand how to plan and conduct user research related to web usability.
3. Learn techniques of responsive web design, including media

Course Outcome:
1. Be able to use the HTML programming language
2. Understand the principles of creating an effective web page.

Unit-I 
Periods: 10
Internet, The Important of the Internet, World Wide Web, URLs, Web Brewers, Web Server, Internet Services, The web flow, objectives of the website, basic interface design, developing a store board for the website, navigation and links within the site, checklist for designing.

Unit–II
Periods: 10

Unit –III
Periods: 10
Images in HTML Pages, Tables in HTML, Frames, Creating Frames, frame attribute linking, complex framesets, Inline frames, Image maps

Unit-IV
Periods: 15
Form designing, Additional Layout features, Intro to CGI Scripting, Active Server Pages, Introduction to Embedding Multimedia and Java Applets, Inserting sound/Audio into Web Pages, Video file formats, Creating Marquee. Into. to JavaScript and Dynamic HTML, Structure of JavaScript.

References Books:
3. HTML, DHTML, JavaScript, Perl CGI by IVAN Bayroos, BPB Publication.
Theory: Paper No.III
Introduction to Data Structure

Course Code: OCS-103

Course Objectives:
1. 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.
2. Able to write well-structured procedure-oriented programs

Course Outcome:
1. To develop application using data structures.
2. Students develop knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, searching etc.

Unit-I  Periods:10
Definition of Data Structure, Elementary data organization, data structure operations, Algorithmic notations, Control structure.

Unit-II  Periods:10
Introduction to Linked list, Representation of linked list in memory, Traversing, Searching in Unsorted linked list, Overflow and Underflow, Inserting at the beginning of a list, deleting node following a given Node.

Unit –III  Periods:10
Stack: Introduction, Memory representation of Stack, Insert element in Stack i.e. PUSH operation, Delete element from Stack i.e. POP operation.
Queue: Introduction, Memory Representation, Insert & Delete operation in Queue.

Unit-IV  Periods:15
Tree: Introduction, Definition of a Binary tree & its Memory representation, Traversing a Binary Tree, PREORDER, INORDER, POSTORDER Traversal, Threaded binary tree.
Graph: Introduction, Memory Representation of graphs,

References Books:
1. Data Structure by Seymour Lipschtz (TMH Publication)
2. An Introduction to Data Structure with Application by Jean Paul
3. Introduction to Algorithms, Cormen Chatles E. Leiserson, PHI Edition
Theory: Paper No. IV
Programming in C Language

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

Course Objectives:

1. The course aims to provide exposure to problem-solving through programming.
2. It aims to train the student to the basic concepts of the C-programming language.

Course Outcome:

1. Course is designed to provide complete knowledge of C language to develop logics which will help them to create programs, applications in C.
2. Introduces the more advanced features of the C language.

Unit-I

Introduction to C, Character set, C tokens, Constant and Variables, Data types, declaration of variables, assigning values to variables, Input/Output Statement, all Operators and Structure of C program.

Unit – II

If Statement, If-Else statement, Nesting of If-Else statement, switch Statement, goto, Looping statements, while loop, do-While, for loop, nested loop.

Unit – III

Introduction to Array, types of array declaration and initialization, introduction to function, recursion, standard library string handling functions: strlen(), strcpy(), strcmp(), strcat(), Storage Classes: auto, static, register, extern

Unit – IV

Introduction to Function, Introduction to Structure and Union, Defining Structure and Accessing Structure members, Introduction to Concept of File Handling.

Reference Books:

1. Programming in ANSI C by E. Balaguruswami. 5th edition
2. Let Us C – Yashwant Kanetkar
3. C Programming - Kernighen Ritche
Practical (Annual) : Paper No.V

[Marks: 100]

Practical Based On Theory Papers – II & IV

Course Code: OCS-105(Lab)

Course Objectives:

1. To familiarize the students to the practical HTML, DHTML and JavaScript
2. Give hands on training to the students and make them acquainted with various Real Time Applications implemented currently in the Industry Using Programming in C Language.

Course Outcome:

1. Practical approach to understand the principles of creating an effective web page.
2. The course is designed to provide complete knowledge of C language to develop logics which will help them to create programs,

➢ At least 10 Practical Sessions based on Paper No. II.
➢ At least 10 Practical Sessions based on Paper No. IV.