॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड
"ज्ञानतीर्थ" परिसर, विष्णुपुरी, 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

संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील प्रथम वर्षाचे **CBCS Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९–२० पासून लागू करण्याबाबत.

परिपत्रक

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

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. Computer Science (3 years)
(Revised CBCS pattern)

Introduced from Academic Year 2019-2020

B.Sc. Computer Science

B.Sc. Computer Science (3years) program / degree is a specialized program in computer sciences. It builds the student on studies in Computer Science and to become competent in the current race and development of new computational sciences. The duration of the study is of six semesters, which is normally completed in three years.

CBCS pattern

The B.Sc. 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. 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. There are 24 credits per semester. A total of 144 credits are essential to complete this program successfully. The Grading pattern to evaluate the performance of a student is as per the University rules.

Every semester has a combination of Theory (core or elective) courses and Lab courses. Each theory course has 04 credits which are split as 03 external credits and 01 internal credit. The university shall conduct the end semester examination for 03 external credits. For theory internal credit, student has to appear for 01 class test (15 marks) and 01 assignment (10 marks). Every lab course has 02 credits which are split as 01 external credit and 01 internal credit. For lab internal credit, the student has to submit Laboratory Book (05 marks) and remaining 20 marks are for the Lab activities carried out by the student throughout the semester. For lab external credit, 20 marks are reserved for the examinational experiment and 05 marks are for the oral / viva examinations.

The open elective has 04 credits which are purely internal. If students are opting for MOOCs as open elective , then, there must be a Faculty designed as MOOCs course coordinator who shall supervise learning through MOOCS. This is intentionally needed as the MOOCs course coordinator shall verify the MOOC details including its duration, staring date, ending date, syllabus contents, mode of conduction, infrastructure feasibility, and financial feasibility during start of each semester. This is precautionary as the offering of the MOOCs through online platforms are time specific and there must be proper synchronization of semester duration with the MOOCs duration. Students must opt for either institutional / college level open elective or a course from University recognized MOOCs platforms as open electives.

The number of hours needed for completion of theory and practical courses as well as the passing rules, grading patterns, question paper pattern, number of students in practical batches, etc shall be as per the recommendations, norms, guidelines and policies of the UGC, State Government and the SRTM University currently operational. The course structure is supplemented with split up in units and minimum numbers of hours needed for completion of the course, wherever possible.

Under the CBCS pattern, students would graduate **B.Sc. Computer Science** with a minimum number of required credits which includes compulsory credits from core courses, open electives and program specific elective course. All students have to undergo lab / practical activities leading to specific credits and project development activity as a part of professional UG program.

1. **B.Sc. Computer Science** Degree / program would be of 144 Credits. Total credits per semester= 24
2. Each semester shall consist of three core courses, one elective course, one open elective course and two practical courses. Four theory courses (core+elective) = 16 Credits
3. Two practical / Lab courses= 4 Credits in total (02 credits each) , One Open elective= 4 credit
4. One Credit = 25 marks , Two Credits = 50 Marks, Four Credits = 100 Marks

PEO, PO and CO Mappings

1. **Program Name** : B.Sc.(Computer Science)

2. **Program Educational Objectives**: After completion of this program, the graduates / students would

PEO I :Technical Expertise	Implement fundamental domain knowledge of core courses for developing effective computing solutions by incorporating creativity and logical reasoning.
PEO II : Successful Career	Deliver professional services with updated technologies in **Computer Science** based career.
PEO III :Hands on Technology and Professional experience	Develop leadership skills and incorporate ethics, team work with effective communication & time management in the profession.
PEO IV :Interdisciplinary and Life Long Learning	Undergo higher studies, certifications and research programs as per market needs.

3. **Program Outcome(s):** Students / graduates will be able to

PO1: Apply knowledge of mathematics, science and algorithm in solving Computer problems.
PO2: Generate solutions by conducting experiments and applying techniques to analyze and interpret data
PO3: Design component, or processes to meet the needs within realistic constraints.
PO4: Identify, formulate, and solve problems using computational temperaments.
PO5: Comprehend professional and ethical responsibility in computing profession.
PO6: Express effective communication skills.
PO7: Recognize the need for interdisciplinary, and an ability to engage in life-long learning.
PO8: Actual hands on technology to understand it's working.
PO9: Knowledge of contemporary issues and emerging developments in computing profession.
PO10: Utilize the techniques, skills and modern tools, for actual development process
PO11: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings in actual development work
PO12: Research insights and conduct research in computing environment.

4. **Course Outcome(s):** Every individual course under this program has course objectives and course outcomes (CO). The course objectives rationally match with program educational objectives. The mapping of PEO, PO and CO is as illustrated below

5. **Mapping of PEO& PO and CO**

Program Educational Objectives	Thrust Area	Program Outcome	Course Outcome
PEO I	Technical Expertise	PO1,PO2,PO3,PO6	All core courses
PEO II	Successful Career	PO4,PO5,PO11,	All discipline specific electives courses
PEO III	Hands on Technology and Professional experience	PO8,PO10	All Lab courses
PEO IV	Interdisciplinary and Life Long Learning	PO7,PO9,PO12	All open electives and discipline specific electives

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED
CHOICE BASED CREDIT SYSTEM (CBCS)
SEMESTER PATTERN
Faculty of Science & Technology
Under Graduate (UG) Programmes
Program: B.Sc. Computer Science w.e.f AY 2019-2020

Year	Semester	Course category	Course Code	Course Title	Credits * *(split up will be given separately)
First	**First**	Core Course	BCS-101	Basic of Computer Science	04
		Core Course	BCS-102	Introduction to Programming Language Using C (Part 1)	04
		Core Course	BCS-103	Web Technologies	04
		Chose any one from the below Elective courses			
		Elective Subject	BCS-104 A	Office Automation	04
			BCS-104 B	Fundamentals of Digital Electronics	
		Chose any one Open Elective courses			
		Open Elective	BCS-105 A	University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses OR	04
			BCS-105 B	Communication Skills – 1	
		Lab / Practical	BCS-106	C Programming part-1	02
			BCS-107	Web Technologies and Office Automation	02
Total					**24**
First	**Second**	Core Course	BCS-201	Operating System	04
		Core Course	BCS-202	Introduction to Programming Language Using C (Part 2)	04
		Core Course	BCS-203	Database Management System	04
		Chose any one from the below Elective courses			
		Elective Subject	BCS-204A	Desktop Publishing	04
			BCS-204B	8085 Microprocessor	
		Chose any one Open Elective courses			
		Open Elective	BCS-205A	University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses OR	04
			BCS-205B	Communication Skills – 2	
		Lab / Practical	BCS-206	C Programming Part-2	02
			BCS-206	DBMS and DTP	02
Total					**24**
For skill enhancement, if any, in all semesters, online course with internal credits is mandatory					

Detailed Syllabus of First Year

Name of Course	**Bachelor of Science (Computer Science)**
Semester	**I**
Name of Subject	Basic of Computer Science
Subject Code	**BCS-101**
Lectures	**50 Lectures**

Objectives

Through this paper Student should learn basic principles of computer. The paper is designed to aim at importing basic level of Computer.

Outcome

To learn Basic Function of Devices like I/O, HDD etc. To Understand the Fundamental of Software and Hardware. Understand the Concept of Operating System and Network.

Unit I

1. **Introduction to Computer and History**   **15 Lectures**
   1.1 Definition of Computer
   1.2 Basic Computer Organization
   1.3 Characteristics of Computer
   1.4 Generations of Computer
   1.5 Types of Computer:- Microcomputer, Minicomputer, Mainframe
       Computer, Workstations, Client and Server

Unit II

2. **Computer Peripherals & Memory**   **10 Lectures**
   2.1 Input Devices :- Keyboard, Mouse, Trackball, Joystick, Light pen
   2.2 Output Devices :- Monitor, Printer, Projector, Biometric Devices
   2.3 Computer Memory :- RAM, ROM, Cache Memory

Unit III

3. **Storage Devices and Operating System**   **15 Lectures**
   3.1 Compact Disk, Digital Versatile Disk
   3.2 Hard Disk Drive
   3.3 USB Flash Drive
   3.4 Memory Card
   3.5 Definition of operating System
   3.6 Types of Operating System
   3.7 Disk Operating System
   3.8 Windows Operating System
   3.9 Linux Operating System

Unit IV

4. **Introduction to Computer Network & Internet**   **10 Lectures**

      4.1 Definition of Network

      4.2 Types of Network :- LAN,MAN,WAN

      4.3 Data Transmission Modes

      4.4 OSI Model

      4.5 E-Mail

      4.6 File Transfer Protocol

      4.7 Web Browser

      4.8 Types of Web Browser

References:-

1 Fundamental of Computer –5th& 6th Edition, P.K.Sinha, BPB Publication

2 Fundamental of Computer - V. Raja Raman, PHI Publication

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Introduction to Programming Language Using C(Part – 1)
Subject Code	BCS-102
Lectures	50 Lectures

Programming in 'C' Objective

It is general purpose and procedure oriented programming language. In which we are able to develop OS and MAC operating system, application software and programming languages. Programming Language are also used to build students logic for programming.

Programming in 'C' Outcomes

To study of structure of programming languages, structure of c program.
To study different keyword for making program.
To develop programs using operators and control statement.
To describe an array.
Student are able to develop application software.

UNIT I

1. Programming languages   **05 Lectures**

1.1 Machine language
1.2 Assembly language
1.3 High level languages
1.4 Compilers and Interpreters

UNIT II

2. Introduction to Programming in C   **15 Lectures**

2.1 History
2.2 Application Areas
2.3 Algorithms
2.4 Flowcharts
2.5 Structure of a C program
2.6 C Tokens
    2.6.1 Keywords
    2.6.2 Variables
    2.6.3 Primary Data types
    2.6.4 Operators
2.7 Formatted I/O Statement
2.8 Unformatted I/O Statement

UNIT III

3.   Controlling Statement   **15 Lectures**

3.1 Decision Making Statement
    3.1.1 If Statement
    3.1.2 If- else Statement
    3.1.3 Nested if –else Statement
    3.1.4 Else if Ladder Statement
    3.1.5 Switch Statement

3.2 Loop Statement
        2.2.1 For Loop
        2.2.2 While Loop
        2.2.3 Do-while Loop
        2.2.4 Nested for Loop
3.3 Break, goto and Continue

UNIT IV

4.	**Array and Structure**	**15 Lectures**

    4.1   Arrays
    4.2   Array declaration, initialization
    4.3   One dimensional Array
    4.4   Two dimensional Array
    4.5   Passing arrays to functions

References:

1. Complete C Reference – Herbert Schildt (Thomson learning publications)
2. The C Programming language – Kernighan and Ritchie
3. Structured Programming approach using C – Forouzan and Gilberg,

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Web Technologies
Subject Code	BCS-103
Lectures	50 Lectures

Objectives:

To improve the skill to create the static web page.

To develop the ability to create the dynamic web pages.

To enhance the ability of Insert a graphic within a web page.

To improve the skills to Create, validate and publish a web page.

Outcome:

At the end of the course, students should be able to: Design and implement dynamic websites with good aesthetic sense of designing

UNIT – I

1. **Introduction of HTML Documents**   **15 Lectures**
   1.1   Historical Roots of HTML,
   1.2   Web page, Website,
   1.3   Structure of HTML documents and Basic Tags: HTML, HEAD, TITLE, BODY
   1.4   Formatting Tags: Paragraph Tags, List tags, HR Tag.
   1.5   Headings Tags, PRE tag, DIV tag, SPAN tag.
   1.6   FONT Tag, ADDRESS tag, MARQUEE tag.
   1.7   Text-Level Elements & other different formatting tags.

UNIT – II

2. **Technologies for Web Application**   **10 Lectures**
   2.1   WWW, Web browser.
   2.2   U.R.L. concept.
   2.3   Web server, Web protocols: HTTP, FTP, Telnet.
   2.4   Hyperlink (Anchor) Tag & it's all attributes,
   2.5   Creating Email Hyperlinks (using mail to anchor)
   2.6   The Role of Images on the Web, tag & it's all attributes, Using Images as links.
   2.7   Tables in HTML:- TABLE, TR, TH, TD tag with example, table with all Attributes

UNIT – III

3. **Basic Interactivity and DHTML**   **15 Lectures**
   3.1   Frames in HTML: FRAMESET & FRAME tags & its attributes
   3.2   Simple Frame Example. Forms in HTML: Introduction to forms.
   3.3   FORM element & it's attributes (Action, Method (GET, POST), Name)
   3.4   Form controls: Text Controls, Password Field, Multiline Text Input,
      1.   Pull-Down Menus, Check Box, Radio Buttons, Scrolled List,
      2.   Reset Button and Submit button.

3.5   Introduction of DHTML, Ramifications of DHTML

3.6   Rollover Buttons.

UNIT – IV

4. CSS and Java Script   **10 Lectures**

4.1   Introduction to Cascading Style Sheets

4.2   Embedded Styles, Inline Styles, Imported/External Styles.

4.3   Introduction of JAVA Script

4.4   Adding script to documents with example. Variables.

4.5   Input and Output statements of JAVA Script

Reference Books:

1.   HTML The complete Reference (2nd Edition Thomas A Powel Tata McGraw Hill publication)

2.   The complete Reference (HTML & XHTML)- 5th Edition Thomas A Powel Tata McGraw Hill publication

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Elective : Office Automation
Subject Code	BCS-104 A
Lectures	50 Lectures

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.

Outcomes

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.   20 Lectures

       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.   10 Lectures

       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.   **10 Lectures**
- 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.   **10 Lectures**
- 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.

Reference Books:

1. MS-DOS 6.22 , Russell A, BPB Publications

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Elective: Fundamentals of Digital Electronics
Subject Code	BCS-104 B
Lectures	50 Lectures

Course Objectives:

The objectives are to study:

1. To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronic circuits.
2. To prepare students to perform the analysis and design of various digital electronic circuits.

Course Outcomes:

After studying this course the students would gain enough knowledge:-

1. Can have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
2. To understand and examine the structure of various number systems and its applications in digital design.
3. The ability to understand, analyze and design various combinational and sequential circuits.
4. To develop skill to build and troubleshoot digital circuits.

UNIT I

1. Number System and Codes   **15 Lectures**

    1.1 Number system types:
        1.1.1 Decimal
        1.1.2 Binary
        1.1.3 Octal
        1.1.4 Hexadecimal
    1.2 Conversions from one number system to other number system
    1.3 Binary Arithmetic:
        1.3.1 Addition
        1.3.2 subtraction
        1.3.3 Multiplication
        1.3.4 Division
    1.4 Complementation Method:
        1.4.1 One's Complement
        1.4.2 Two's complement
    1.5 Codes:
        1.5.1 BCD code
        1.5.2 Excess-3 code
        1.5.3 Gray code
    1.6 Error Detecting and Correcting codes:
    1.6.1 Parity code
    1.6.2 Hamming code

2. **Logic Gates and Logic equation Simplification with K-MAP** **10 Lectures**

    2.1 Introduction to signals

       2.1.1 Analog signal

       2.1.2 Digital signal

    2.2 Logic Gates

         2.2.1 Basic gates: AND gate, OR gate and NOT gate

         2.2.2 Universal gates: NAND gate and NOR gate

         2.2.3 Special purpose gates: EX-OR gate and EX-NOR gate

    2.3 De-Morgan's theorems

    2.4 Standard representation of logical functions in SOP and POS form

    2.5 Simplification of logical functions using K-MAP

3. **Combinational Circuits and Converters** **10 Lectures**

    3.1 Half Adder and Full Adder

    3.2 Multiplexer and its types

    3.3 De-Multiplexers and its types

    3.4 Encoder and Decoder (only one example)

    3.5 Analog- to- Digital Converter

    3.6 Digital-to-Analog Converter

4. **Sequential Circuits** **15 Lectures**

    4.1   Flip-Flop and its types

         4.1.1 SR-FF

         4.1.2 JK-FF

         4.1.3 D-Type FF

         4.1.4 T-Type FF

    4.2   Counters

         4.2.1 Asynchronous Counter

         4.2.2 Synchronous Counter

    4.3   Registers

         4.3.1 SISO Shift Register

         4.3.2 SIPO Shift Register

         4.3.3 PISO Shift Register

         4.3.4 PIPO Shift Register

References:

1. " Modern Digital Electronics": -by R. P. Jain Tata McGraw -Hill Publication 3rfd Edition ISBN: 978-0-07-049492-3
2. MICROPROCESSOR -by B. Ram publication 5th Edition
3. Fundamentals of Computer by P.K. Sinha BPB publication 6th Edition ISBN:81-7656-752-3

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Open Elective : University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses
Subject Code	BCS-105 A
Lectures	50 Lectures

OR

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Open Elective : Communication Skills-1
Subject Code	BCS-105 B
Lectures	50 Lectures

Objectives of the Course:
1. To make a comprehensive use of English in day-to-day life.
2. To help Students develop the ability to learn and contribute critically.
3. To develop the writing skills of the students.
4. To help the students to understand the basic usages of English.

Course outcome:
By the end of this course students should be able to:
1. Understand and demonstrate Basic English usages for their different purposes.
2. Clear entrance examination and aptitude tests.
3. Write various letters, reports required for professional life.

Unit One: Basic English Grammar,
1. Word classes: Open Word Classes & Close Word Classes
2. Word Formation Process; Word analysis
3. Phrases: NP, VP, AdjP, AdvP, PrepP
4. Clauses: Clause Elements, Basic Structure
5. Sentences: Complex & Compound

Unit Two: Grammar- it's Usage
1. Tenses: Present, Past, Future
2. Voice: Active & Passive
3. Speech: Direct & Indirect
4. Common Errors in English
5. Transformation of Sentences

Unit Two: Communication Skill & Soft Skills
1. Communication Skills: Definition & Concept
2. Process /cycle of Communication,
3. Types/Methods of Communication,
4. Barriers of Communication
5. Soft Skills: Concept, Negotiation skills, Empathy, Manners & Etiquettes.

Unit Three: Language Skills
1. Language: Definition & its Characteristics.
2. Listening Skill: Process and types.
3. Speaking Skill: Process, style.
4. Reading skill : Process , Reading comprehension passage.
5. Writing Skill : Process & importance

Unit Four: Presentation skills
1. Seminars
2. Conference
3. Anchoring & Vote of Thanks
4. Narrating Incidents
5. Story Telling

References:-
1. Practical English Grammar by – A.J. Thomson
2. Mac Millan Foundation English by - R. K. Dwivedi, A. Kumar.
3. Soft Skills by - K Alex.
4. Group Discussion for Admissions & Jobs by - AnandGanguly
5. Effective Telephone Skills by - Thomas J. Farrell
6. Written & Spoken English by - V. H. Savant & S. R. Madan
7. Modern English Grammar: An Introduction by - L.S. Deshpande, P.H. Dharamsi.

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Lab-Course : C Programming Part – 1
Subject Code	BCS-106

1. Program to demonstrate Basic structure of C Programming
2. Program to demonstrate Data Types
3. Program to demonstrate Operators
4. Program to demonstrate I/O Statement
5. Program to demonstrate Decision Making statement
6. Program to demonstrate Looping Statement
7. Program to demonstrate Break, Continue, goto statement
8. Program to demonstrate Array

Name of Course	Bachelor of Science (Software Engineering)
Semester	I
Name of Subject	Lab-Course : Web Technologies and Office Automation
Subject Code	BCS-107

Web Technologies

1. Create a web page for describing the structure of HTML
2. Create a web page on text level elements
3. Create a web page for p, font, address, marquee tags.
4. Create a web page with anchor tag with all attributes.
5. Create a web page for img tag with all attributes.
6. Create a web page for table tag with all attributes.
7. Describe a frame tag with all attributes.
8. Create a web page for user registration form using all controls and attributes of form tag.
9. Create a web page for rollover button.
10. Create a web page for CSS of embedded styles
11. Create a web page for CSS of Inline styles.
12. Create a web page for CSS for imported/external styles.
13. Write a program for adding java script to documents in web page.
14. Write a program on input and output statements of java script.

Office Automation

1) Study of Word Opening screen
2) Study of EXCEL Opening screen
3) Study of PowerPoint Opening screen
4) Study of Access Opening screen
5) Study of Find and Replace Dialog Box in Microsoft Word
6) Study of Page Setup Dialog Box
7) Study of Table Formatting
8) Study of Custom Dictionary & Go to Dialog Box
9) Study of mail merge
10) Study of creating charts.
11) Study of border and shading dialog box
12) Study of paragraph dialog box
13) Working of Formulas in Excel
14) Creating Presentation in Power Point
15) Creating database file in Access

Name of Course	Bachelor of Science (Computer Science)
Semester	II
Name of Subject	Operating System
Subject Code	BCS-201
Lectures	50 Lectures

Course Objectives:

- To introduce basic concepts and functions of modern operating systems.
- To understand the concept of process and thread management.
- To understand the scheduling of processes and threads.
- To understand various Memory Management techniques.

Course Outcomes:

- Fundamental understanding of the role of Operating Systems.
- To understand the various memory management techniques
- To apply the cons of process/thread scheduling
- To understand the concept of a process and thread.

Unit I

1. Introduction: 12 Lectures

1.1   What Operating System Do – 1) User View 2) System View 3) Defining OS, Computer System Organization,
1.2   Computer System Architecture – 1) Single Processor System 2) Multiprocessor System,
1.3   Extended Machine Concept,
1.4   Operating System Structure,
1.5   An Operating System Resource Manager

Unit II

2. System Structure: 12 Lectures

2.1 Operating System Services
2.2 User Operating System Interface
       1)   Command Interpreter
       2)   GUI, System Boot
2.3 System Calls
2.4 Types of System Calls
       1)   Process Control
       2)   File Management
       3)   Device Management
       4)   Information Maintenance
       5)   Communication
       6)   Protection

3. Processor Management: **16 Lectures**

    3.1 Process Concept
           1) The Process
           2) Process States
           3) Process Control Block
    3.2 Process Scheduling
           1) Scheduling Queues
           2) Schedulers
           3) Context Switching,
    3.3 Scheduling Algorithms
           1) FCFS
           2) SJF
           3) Priority Scheduling
           4) Round-Robin Scheduling.

4. Memory Management: **10 Lectures**

    4.1 Introduction
    4.2 Contiguous Memory Allocation
           1) Memory Allocation
           2) Fragmentation
    4.3 Paging
           1) Basic Method
           2) Hardware Support
    4.4 Segmentation
           1) Basic Method
           2) Hardware Support.

Reference Books:

1) Operating System - Achyut Godbole, Atul Kahate

Name of Course	Bachelor of Science (Computer Science)
Semester	II
Name of Subject	Introduction to Programming Language Using C Part – 2
Subject Code	BCS-202
Lectures	50 Lectures

Programming in 'C' Objective

It is general purpose and procedure oriented programming language. In which we are able to develop OS and MAC operating system, application software and programming languages. Programming Language are also used to build students logic for programming.

Programming in 'C' Outcomes

To describe a function, storage classes, structure, union, string and functions, Pointers, File Handling, Student are able to develop application software.

UNIT I

3.   Function in C   **10 Lectures**

3.1 Functions in C
3.2 What is a function?
3.3 User defined functions
        3.3.1 Declaration
        3.3.2 Definition
        3.3.3 Function calling
3.4 Types of Function
3.5 Recursion
3.6 Standard String library functions
3.7 Storage Classes

UNIT II

2.   Pointers   **15 Lectures**

2.1 What is Pointer? Pointer declaration, initialization
2.2 Dereferencing pointers
2.3 Pointer to pointer
2.4 Arrays and pointers
2.5 Functions and pointers
2.6 Pointer to function
2.7 Dynamic memory allocation
2.8 Command Line Arguments

UNIT III

3.   Structures and Unions   **15 Lectures**

3.1 Creating structures
3.2 Accessing structure members (dot Operator)
3.3 Array of structures
3.4 Nested structures
3.5 Pointers and structures
3.6 Unions

4. **File Handling** **10 Lectures**

    4.1   What is File?
    4.2   Creating File
    4.3   Types of File
    4.4   Operation on File
    4.5   Random Access to File

References:
1. Complete C Reference – Herbert Schildt (Thomson learning publications)
2. The C Programming language – Kernighan and Ritchie
3. Structured Programming approach using C – Forouzan and Gilberg,
4. Pointer in 'C' Kanetkar Yashavant P. (BPB Publication)

Name of Course	Bachelor of Science (Computer Science)
Semester	II
Name of Subject	Database Management System
Subject Code	BCS-203
Lectures	50 Lectures

Objective: To have basic understanding of database management system components

Outcome: students will be able to think of ER modelling and creation of own database schema

UNIT I

1. DBMS Concepts : 15 Lectures
1.1 What is Database?
1.2 Database Management System (DBMS)
1.3 Architecture of DBMS – Three level
1.4 Structure of DBMS
1.5 Entity, Attributes, type of relationships,
1.6 DBMS users
1.7 DBMS Facilities
1.8 Advantages and Disadvantages of DBMS
1.9 Data Models
1.10 Database Languages (DDL, DML, DCL, DQL, TCL)

UNIT II

2. Database System architectures : 15 Lectures
2.1 Centralized & Client Server Architectures
   a. Centralized Systems
   b. Client-Server Systems
2.2 Server System Architectures
   a. Transaction Server
   b. Data Server
2.3 Parallel Systems
   a. Speedup & Scale up
   b. Parallel Database Architectures
      i. Shared Memory
     ii. Shared Disk
    iii. Shared Nothing
    iv. Hierarchical
2.4 Distributed Systems
   a. An Example of Distributed Database

3 Database Design & the ER Model : 10 Lectures
   3.1   Overview of the Design Process
         a.   Design Phases
   3.2   The Entity-Relationship Model
         a.   Entity Sets
         b.   Relationship Sets
         c.   Attributes
   3.3   Constraints
         a.   Mapping Cardinalities
         b.   Keys
             i.   Entity Sets
             ii.   Relationship Sets
             iii.   Participation Constraints
   3.4   Entity Relationship Diagrams

4. Introduction to SQL : 10 Lectures
   4.1   Background
   4.2   Basic Data types in SQL
   4.3   Types of SQL Commands (DDL, DML, DCL, DQL, TCL)
   4.4   Basic Structure of SQL Queries
   4.5   Table Creation, Data insertion, Data Updating, Data Selection
   4.6   Changing Table Structure,
   4.7   WHERE Clause, DISTINCT Clause, Using Column Aliases
   4.8   Working with Views
         a.   Creating View on Tables
         b.   Creating View on Views
         c.   Updating Views
         d.   Altering Views
   4.9   SQL Functions
         a.   Single Row Functions (Character Functions, Case Manipulation, Character Manipulation Number Functions, Date Functions, Conversion Functions)
         b.   Multiple Row Functions

Reference Books
1. An Introduction to Database Systems By Bipin C Desai (Galgotia Pubclication)
2. Database System Concepts By Abraham Silberschatz, Henry F Korth, S. Sudarshan (McGRAW Hill Publication)
3. SQL, PL/SQL the Programming Language of Oracle by Ivan Bayross

Name of Course	**Bachelor of Science (Computer Science)**
Semester	**II**
Name of Subject	**Elective : Desktop Publishing**
Subject Code	**BCS-204 A**
Lectures	**50 Lectures**

Objective

> This course will provide students the opportunity to learn to use basic features of desktop publishing software to create all types of publications: flyers, brochures, newsletters, and advertisements. Included in the course will be basic page layout and design principles and integrating text and graphics to create attractive business publications. The course will be taught with Adobe InDesign.

Outcomes

> Create personal documents such as business cards and resumes.
> Create business documents such as flyers and advertisements.
> Create a newsletter with graphics and draw objects.
> Create a course project illustrating Desktop Publishing techniques.

UNIT I

1. PAGEMAKER 15 Lectures
  1. PAGEMAKER BASICS
    - 1.1 Starting PageMaker.
    - 1.2 PageMaker Window Elements.
    - 1.3 Viewing the Page.
    - 1.4 Toolbox.
    - 1.5 Using the Zoom Tool.

UNIT II

2. WORKING WITH A PUBLICATION 10 **Lectures**
  2. Working With A Publication
    - 2.1 Opening a Publication.
    - 2.2 Creating a New Document.
    - 2.3 Setting the Margins.
    - 2.4 Setting the Page Size.
    - 2.5 Setting the Page Orientation.
    - 2.6 The Page Icons.
    - 2.7 Displaying Master Pages and Master Page Items.
    - 2.8 Inserting and Removing Pages, Inserting a Page, Removing a Page,
    - 2.9 Setting Page Numbers.
    - 2.10 Saving a New Document.

3.   INTRODUCTION TO ADOBE PHOTOSHOP   10 Lectures

3. Basic Features of Adobe Photoshop.
   3.1   Various Page Mesurments.
   3.2   Use Of Various Tools
   3.3   Layer Concepts,
   3.4   Basic Of Type
   3.5   Control Settings & Placements.

UNIT IV

4.   IMAGE EDITING WITH ADOBE PHOTOSHOP   15 Lectures

   4.1   Images Contrast, Tonning & Colour Correction.
   4.2   Colour Conversions.
   4.3   Cleaning, Repairing & Altering Images.
   4.4   Shadow, Relection & Dimention.
   4.5   Creating Background, Patterns, Brushes, Texture & Frames.
   4.6   Types Effects.
   4.7   Freehand.

Reference Books:

1.   Adobe PageMaker 7.0 Classroom in a Book by Adobe Creative Team
2.   Adobe Photoshop 7.0 Classroom in a Book by Adobe Creative Team

Name of Course	Bachelor of Science (Computer Science)
Semester	II
Name of Subject	Elective : 8085 Microprocessor
Subject Code	BCS-204 B
Lectures	50 Lectures

Course Objectives:

1. To understand basic architecture of 8-bit Microprocessor.
2. To understand interfacing of 8085 Microprocessor with peripherals and Memory.

Course Outcomes:

1. To understand CICS and RISC based Microprocessor.
2. To understand techniques for faster execution of instruction and increase speed of operation of 8085 Microprocessor.
3. Write programs to run 8085 Microprocessor based system.

UNIT I

1. Microprocessor Architecture   **10 Lectures**

    1.1 Introduction to 8085 Microprocessor
        1.1.1 Features of 8085 Microprocessor
    1.2 Block diagram of 8085 Microprocessor
        1.2.1 ALU
        1.2.2 Address/Data Bus
        1.2.3 Timing and control unit
        1.2.4 Registers
    1.3 Pin configuration of 8085 Microprocessor
    1.4 Opcode and Operand
    1.5 Instruction Formats

UNIT II

2. Addressing Modes and Instruction Cycle   **10 Lectures**

    2.1 Addressing modes:
        2.1.1 Register Addressing
        2.1.2 Direct Addressing
        2.1.3 Indirect Addressing
        2.1.4 Immediate Addressing
        2.1.5 Implicit Addressing
    2.2 Instruction Cycle
        2.2.1 Fetch cycle
        2.2.2 Execute cycle
        2.2.3 Machine cycle

UNIT III

3.   Instruction Set of 8085 Microprocessor   15 Lectures

      3.1 Introduction to instruction set of 8085

      3.2 Data Transfer Group of instruction

      3.3 Arithmetic Group of instruction

      3.4 Logical group of instruction

      3.5 Branch Control Group of instruction

      3.6 Machine and I/O Control Group of instruction

UNIT IV

4.   Programming of 8085 Microprocessor   15 Lectures

      4.1 Introduction

      4.2 Assembly Language Programming

References:

1. Fundamentals of MICROPROCESSOR and Microcomputer -by B. Ram publication 5th Edition

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Open Elective : University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses
Subject Code	BCS-205 A
Lectures	50 Lectures

OR

Name of Course	Bachelor of Science (Computer Science)
Semester	I
Name of Subject	Open Elective : Communication Skills-2
Subject Code	BCS-205 B
Lectures	50 Lectures

Objectives of the Course:
1. A comprehensive use of English in day-to-day life.
2. To help Students develop the ability to learn and contribute critically.
3. To develop the writing skills of the students.
4. To help the students to understand the basic usages of English.

Course outcome:
By the end of this course students should be able to:
1. Understand and demonstrate Basic English usages for their different purposes.
2. Clear entrance examination and aptitude tests.
3. Write various letters, reports required for professional life.

Unit one: Phonetics: Study of Speech Sounds
1. Phonemes: Consonants (24) Vowels (20),
2. Stress; Three Term Label,
3. Intonation,
4. Word Transcription,
5. Sentence Transcription.

Unit two: Soft Skills
1. Soft Skills: Leadership Skills,
2. Soft Skills: Time management,
3. Soft Skills: Stress management,
4. Conflict Management,
5. Meditation.

Unit Three : Career Skills
1. Group Discussion,
2. Personal Employment Interview,
3. Telephonic Etiquettes & Interview,
4. Report Writing: Formal & Informal Report Writing,
5. Meetings.

Unit Four: Creative Writing & Situational English
1. Creative writing: Narrating a situation,
2. Situational English: Greetings, Introducing, Inviting, Thanking, Enquiring, Complimenting, Complaining etc.

3. Note Making & Note Taking ,
4. Dialogue writing,
5. Formal Letters Writing: Job Application, Curriculum Vitae, Supply Orders, Complaint letters.

Reference Books:

1. Mac Millan Foundation English by - R. K. Dwivedi, A. Kumar.
2. Developing communication Skills by - Krishna Mohan, Meera Banerji
3. Soft Skills by - K Alex.
4. Spoken English- Level one by - G Radhakrishana Pillai, K Rajeevan
5. Personality Development & Communicative English by - Dr. T. Bharti & Dr. M. Hariprasad
6. Effective Telephone Skills by - Thomas J. Farrell
7. Written & Spoken English by - V. H. Savant & S. R. Madan
8. Art of public speaking by - Dr. B. R. Kishore
9. Better English Pronunciation by – J.D.O.Connor

Name of Course	Bachelor of Science (Computer Science)
Semester	II
Name of Subject	Lab-Course : C Programming (Part – 2)
Subject Code	BCS-206

1. Program to demonstrate Function in C
2. Program to demonstrate recursion
3. Program to demonstrate String Library function
4. Program to demonstrate Pointer
5. Program to demonstrate Dynamic Memory Allocation
6. Program to demonstrate Command Line Argument
7. Program to demonstrate creating structure
8. Program to demonstrate Union
9. Program to demonstrate File Handling
10. Program to demonstrate Random access to file

Name of Course	Bachelor of Science (Computer Science)
Semester	II
Name of Subject	Lab-Course : DBMS and DTP
Subject Code	BCS-207

DBMS

1. Study of Data Definition Language (DDL)
      a) CREATE TABLE / VIEW / SEQUENCE
      b) ALTER TABLE / VIEW / SEQUENCE
      c) DROP TABLE / VIEW / SEQUENCE
      d) DESCRIBE Table / View
2) Study of Data Manipulation Language (DML)
      a) SELECT
      b) INSERT
      c) UPDATE
      d) DELETE
3) Study of Data Control Language (DCL)
      a) GRANT
      b) REVOKE
4) Study of Transaction Control Language (TCL)
      a) What is Transaction?
      b) Starting a Transaction
      c) COMMIT
      d) ROLLBACK
      e) SAVEPOINT
5) Study of SQL clauses
      a) WHERE Clause
      b) Column Alias
      c) Distinct clause
6) Study of Arithmetic operators
7) Study of Relational operators (=, <, >, <=, <=, != or <>, :=, || Concatenation)

8) Study of Logical Operators
     a) AND
     b) OR
     c) NOT)
9) Study of Comparison Operators
     a) BETWEEN
     b) IN
     c) LIKE
10) Study of Views in SQL
11) Study of SQL Functions
    a) Single Row Functions
- Character Functions,
  - Case Manipulation ,
  - Character Manipulation
- Number Functions,
- Date Functions,
- Conversion Functions

    b) Multiple Row Functions

DTP
1. Draw an opening Screen of PageMaker.
2. Draw a toolbox in PageMaker.
3. Draw Document Setting Dialog box
4. Write Steps for creating new Document.
5. Create Visiting Card in PageMaker.
6. Create Letter Head in PageMaker.
7. Draw an opening Screen of Photoshop.
8. Write Step for Create New Document in Photoshop.
9. Creating Your Artwork in Photoshop
10. Change color Pattern of Image in Photoshop
11. To Crop the image in Photoshop