।। 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

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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. Software Engineering (3 years)
(Revised CBCS pattern)

Introduced from Academic Year 2019-20

B.Sc. Software Engineering

B.Sc. Software Engineering (3years) program / degree is a specialized program in computer software development essentials. It builds the student on studies in software development 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. Software Engineering 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. Software Engineering** 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. Software Engineering** 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. Software Engineering 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.(Software Engineering)
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 Software Engineering 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 software development processes.
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
Revised Syllabus w.e.f AY: 2019-2020
Program: B.Sc. Software Engineering

Year	Semester	Course category	Course Code	Course Title	Credits * *(split up will be given separately)
First	**First**	Core Course	BSE-101	Basics of Computer System	04
		Core Course	BSE-102	Web Page Designing	04
		Core Course	BSE-103	Programming in C (Part – 1)	04
		Chose any one from the below Elective courses			
		Elective Subject	BSE-104 A	Fundamentals of Digital Logic	04
			BSE-104 B	Office Automation	
		Chose any one Open Elective courses			
		Open Elective	BSE-105 A	University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses OR	04
			BSE-105 B	Applied English OR Business Communication	
		Lab / Practical	BSE-106	C Programming Part-1	02
			BSE-107	Web Page Designing	02
Total					**24**
First	**Second**	Core Course	BSE-201	Software Engineering	04
		Core Course	BSE-202	Database Management System	04
		Core Course	BSE-203	Programming in C (Part-2)	04
		Chose any one from the below Elective courses			
		Elective Subject	BSE-204A	Computational Mathematics	04
			BSE-204B	Desktop Publishing (DTP)	
		Chose any one Open Elective courses			
		Open Elective	BSE-205A	University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses OR	04
			BSE-205B	Functional English or Corporate English	
		Lab / Practical	BSE-206	DBMS using – MySQL	02
			BSE-207	C Programming Part-2	02
Total					**24**
For skill enhancement, if any, in all semesters, online course with internal credits is mandatory					

Code: BSE-101	First semester	**Basics of Computer System**	Credits: 04

Course Objectives :

1. Study of motherboard components.
2. Basics knowledge of computer evolution.
3. Managing Hardware Devices.
4. Study of Computer Languages

Course Outcome :

1. Design, install, configure, troubleshoot and manage components of computer systems.
2. Apply basic knowledge of Hardware Devices.
3. Install, manage, and maintain Computer System.
4. Best Practices for Computer assembling.

Unit-1:	**Introduction**
Characters of computers, The Evolution of computer, generations of Computer, Classification of computers, Basic computer organization.	
Unit-2:	**Hardware Component on Motherboard**
Mother Board and its types, Types of HDD, Types of RAM, Types of Chipsets, Microprocessor and its type, IDE and SATA cables, Other parts on motherboard.	
Unit-3:	**Input Output Devices**
Input devices, Point-and-draw devices, Data scanning devices, Digitizer, Electronic card reader Output device, Monitors, Printers, Plotters, Screen image projector.	
Unit-4:	**Processor & Memory**
Central processing unit, The control unit, Arithmetic logic unit ,Instruction sets , Registers, Processor speed ,Types of processors, The main memory ,Storage evaluation criteria ,Main memory organization	
Unit-5:	**Secondary Storage Devices**
Sequential and Direct-Access Devices ,Magnetic tape ,Basic principles of operation Types of magnetic tapes ,Advantages & disadvantages of magnetic tapes , Uses of magnetic tapes ,Magnetic disks.	
Unit-6:	**Computer Languages**
Machine Language, Advantages & Limitations of Machine Language, Assembly Language Assembler , Advantages & limitations of Assembly Language , Level Language Compiler, Linker, Interpreter, Advantages & limitations of high level language.	

Reference Books

1.	Fundamental of Computer –By Pradeep K.Sinha and Priti Sinha
2.	Fundamental of Computer System-Low price Edition.
3.	Computer Fundamental –By Rajaraman PHI publication

Code: BSE – 102	First semester	**Web Page Designing**	Credits: 04

Course Objectives:

1. To improve the skill to create the static web page.
2. To develop the ability to create the dynamic web pages.
3. To enhance the ability of Insert a graphic within a web page.
4. To improve the skills to Create, validate and publish a web page.

Course Outcome:

1. The ability to understand, analyse and design various websites.
2. Student are able to develop websites, webpages.

Unit-1:	**Introduction of HTML Documents**
Historical Roots of HTML, Web page, Website, Structure of HTML documents and Basic Tags: HTML, HEAD, TITLE, BODY, Formatting Tags: Paragraph Tags, List tags, HR Tag., Headings Tags, PRE tag, DIV tag, SPAN tag., FONT Tag, ADDRESS tag, MARQUEE tag., Text-Level Elements & other different formatting tags.	
Unit-2:	**Technologies for Web Application**
WWW, Web browser, U.R.L. concept, Web server, Web protocols: HTTP, FTP, Telnet, Hyperlink (Anchor) Tag & it's all attributes, Creating Email Hyperlinks (using mail to anchor)	
Unit-3:	**Use of Image And Table**
The Role of Images on the Web, tag & it's all attributes, Using Images create a links., Tables in HTML:- TABLE, TR, TH, TD tag with example, table with all Attributes	
Unit-4:	**Basic Interactivity and DHTML**
Frames in HTML: FRAMESET & FRAME tags & its attributes, Simple Frame Example, Forms in HTML: Introduction to forms, FORM element & it's attributes (Action, Method (GET, POST), Name), Form controls: Text Controls, Password Field, Multiline Text Input, Pull-Down Menus, Check Box, Radio Buttons, Scrolled List, Reset Button and Submit button.	
Unit-5:	**DHTML & CSS**
Introduction of DHTML, Ramifications of DHTML, Rollover Buttons, Introduction to Cascading Style Sheets, Embedded Styles, Inline Styles, Imported/External Styles.	
Unit-6:	**Introduction to Java Script**
Introduction of JAVA Script, Adding script to documents with example, Variables, Use of different variable, 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

Code: BSE-103	First semester	**Programming in C (Part – 1)**	Credits: 04

Course Objectives :

1. 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.

Course Outcome :

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

Unit-1:	**Programming languages**

Machine language, Assembly language, High level languages, Compilers and Interpreters

Unit-2:	**Introduction to Programming in C**

History, Application Areas, Algorithms, Flowcharts, Structure of a C program

Unit-3:	**C Tokens**

Keywords, Variables, Primary Data types, Operators, Formatted I/O Statement, Gets(), Puts(), Getc(), Putc(), Unformatted I/O Statement, Printf(), scanf()

Unit-4:	**Decision Making Statement**

If Statement, If- else Statement, Nested if –else Statement , Else if Ladder Statement, Switch Statement

Unit-5:	**Loop Statement**

For Loop, While Loop, Do-while Loop, Nested for Loop, Break, goto and Continue

Unit-6:	**Array and Structure**

Arrays, Array declaration, initialization, One dimensional Array, Two dimensional Array, Passing arrays to functions

Reference Books

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,

Code: BSE-104 A **Elective**	First semester	**Fundamentals of Digital Logic**	Credits: 04

Course Objectives :

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 Outcome :

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

Unit-1:	**Number System and Codes**

Number system types : Decimal, Binary, Octal, Hexadecimal , Conversions from one number system to other number system, Binary Arithmetic: Addition, subtraction, Multiplication, Division, Complementation Method: One's Complement, Two's complement, Codes: BCD code, Excess-3 code, Gray code

Unit-2:	**Fundamental concepts and Logic Gates**

Introduction to signals, Analog signal, Digital signal, Logic Gates, Basic gates: AND gate, OR gate and NOT gate, Universal gates: NAND gate and NOR gate, Special purpose gates: EX-OR gate and EX-NOR gate, De-Morgan's theorems, Why NAND and NOR gates are called as Universal gates?, Half adder and Full adder

Unit-3:	**Combinational Logic Design**

K-Map solving Methods: SOP and POS, Simplification of logical functions using K-Map, Multiplexers and its types, De-Multiplexers and its types, Encoder and Decoder

Unit-4:	**Flip-Flops**

1-Bit Memory Cell, Flip-Flop and its types, SR-FF, JK-FF, D-Type FF, T-Type FF, Master-Slave JK-FF

Unit-5:	**Sequential Logic Design**

Registers: SISO Shift Register, SIPO Shift Register, PISO Shift Register, PIPO Shift Register, Counters: Asynchronous Counter, Synchronous Counter

Unit-6:	**Converters**

Analog- to- Digital Converter types, Simultaneous A/D converter, Successive Approximation A/D converter, Counter type A/D converter, Digital-to-Analog Converter types, Weighted Register D/A converter, R-2R Ladder D/A converter

Reference Books

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

Code: BSE-104 B **Elective**	First semester	**Office Automation**	Credits: 04

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-1: Introduction to MS-Word

Word 2010 Basics: - Opening screen of MS-word, uses of MS-word, Home menu- font tab, paragraph tab, styles tab, editing options in MS-Word, Header and Footer tool, custom dictionary, printing in MS-Word.

Unit-2: Working with Tables and Columns

Creating table, entering text in a table using table tools, changing column's width with autofit, gridlines, merging cells, table formatting –sorting tables, copying tables and deleting tables, mail-merge.

Unit-3: Working With MS-Excel

Introduction to MS-Excel, Working with spreadsheet, formatting spreadsheet, working with Formulas and Functions, Goal seek, data validation, Conditional Formatting.

Unit-4: Creating and Formatting Charts

Introduction to charts, creating charts, Formatting charts, Exploring charts.

Unit-5: Working with Microsoft power point

Opening Screen of MS PowerPoint, creating a new presentation based on template, design template and blank presentation, slide Transition, custom Animation effects, slide show, adding audio and video on slides.

Unit-6: Introduction to MS-Access

Opening screen of MS-Access, performing Queries, Generating the report, creating the database in Access, creating forms and adding new records in MS-Access.

Reference Books

1.	Microsoft Office 2010, PBP Publication by Prof. Satish Jain, M. Geetha, Kratika
2.	Microsoft office 2000 by Rebecca J. Fiala
3.	Working in Microsoft Office by TATA McGraw-Hill Edition.

Code: BSE-105 A	First semester	**Open Elective**	Credits: 04

University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses

OR

Code: BSE-105 B	First semester	**Applied English**	Credits: 04
Course Objectives : 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-1:	**Morphology**		
Morphology: Free & Bound Morphemes, Word Formation Processes, Morphological Analysis of words			
Unit-2:	**Grammar in day-to-day use:**		
Word Classes: Open and Closed Word Classes, Phrase: Types and functions of the phrases			
Unit-3:	**Auxiliary Verbs**		
Verbs: Primary Auxiliary and Secondary Auxiliary, Usages and Functions of modal auxiliaries, Questions using Model Auxiliaries			
Unit-4:	**Transformation of Sentences**		
Voice: Active & Passive, Speech: Direct & Indirect			
Unit-5:	**Error Detection**		
Determiners: Article, Quantifiers and Demonstratives, Subject – Verb Agreement			
Unit-6:	**Tenses and their usages**		
Simple Present, Simple Past, Simple Future			
Reference Books			
1.	Modern English Grammar-L. S. Deshpande (creative Publication)		
2.	A Practical English Grammar- A. J. Thomson. (Oxford University)		
3.	Macmillan Foundation English. - R. K. Dwivedi & a. Kumar (Mammalian India Ltd)		
4.	Writing English for You- G. Radhakrishna Pillai (Emerland Publication)		
5.	High School English Grammar & Composition - Wren & Martin (S. Chand)		
6.	Radiance Communication Skills- Editorial Board (SRTM University) Orient Black Swan.		
7.	English Grammer and Composition – Rejendra Pal and Prem Lata Suri (Sultan Chand and Sons)		

OR

Code: BSE-105 B	First semester	**Business Communication**	Credits: 04

Course Objectives :

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-1:	**Basic English Grammar**
Noun, Verb, Adjective, Adverb	
Unit-2:	**Sentence Elements**
Elements of sentences and their structures, Clauses: - Noun, Adjective, Adverb, Sentence: - Simple, Compound, Complex	
Unit-3:	**Morphology**
Affixes, Processes of Word Formation: Major and Minor Processes, Morphological Analysis of words	
Unit-4:	**Writing Skills**
Essay Writing, Email Writing, Resume	
Unit-5:	**Oral Communication**
Group Discussion, Seminars and Conferences, Interview	
Unit-6:	**Situational English**
Dialogue Writing, Role Playing, Story Telling	

Reference Books	
1.	Modern English Grammar-L. S. Deshpande (creative Publication)
2.	A Practical English Grammar- A. J. Thomson. (Oxford University)
3.	Macmillan Foundation English. - R. K. Dwivedi & a. Kumar (Mammalian India Ltd)
4.	Writing English for You- G. Radhakrishna Pillai (Emerland Publication)
5.	High School English Grammar & Composition - Wren & Martin (S. Chand)
6.	Radiance Communication Skills- Editorial Board (SRTM University) Orient Black Swan.
7.	English Grammer and Composition – Rejendra Pal and Prem Lata Suri (Sultan Chand and Sons)

Code: BSE-106	First semester	**Lab-1: C Programming Part - 1**	Credits: 02
	Practical List:		

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
8. Program to demonstrate goto statement
9. Program to demonstrate Array
10. Program to demonstrate two dimensional array

Code: BSE-107	First semester	**Lab-2: Web Page Designing**	Credits: 02
	Practical List:		

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. 2 Hours

Code: BSE-201	Second semester	**Software Engineering**	Credits: 04

Course Objectives:

1. To improve software engineering development skills and testing plans.
2. To recognize system concepts and its application in Software development.
3. To develop skills of designing and testing software.
4. To acquire technical skills to assure production of quality software.

Course Outcome:

1. Facility to learn development skills of software
2. Capability to apply various techniques for software testing

Unit-1: Introduction to Software Engineering

The Evolving Role of Software, Software, Software Characteristics, Software Applications, Software Evolution, Software Crisis & Horizon, Software Myths

Unit-2: Process of Software

Software Engineering, Software Process, The Waterfall Model, Incremental Process Models, Spiral Model

Unit-3: A Generic View of Process

Software Engineering – A Layered Technology, Framework Personal and Team Process Models, Personal Software Process (PSP), Team Software Process (TSP), Process Technology, Product and process

Unit-4: AGILE DEVELOPMENT

What Is Agility?, What Is an Agile Process?, The Politics of Agile Development, Agile Process Models, Feature Driven Development (FDD)

Unit-5: Software Project Planning

Software Scope, Resources, Software Project Estimation, Decomposition Techniques, Empirical Estimation Models, COCOMO Model.

Unit-6: Software Engineering Practice

Software Engineering Practice, The Essence of Practice, Core Principles, Communication Practices, Planning Practices, Modeling Practices, Analysis Modeling Principles, Design Modeling Principles

Reference Books

1.	Software Engineering 7th Edition R.Pressmen M C Graw Hill
2.	Software Engineering 7th / 8th Edition IAN Sommerville Pearson Edi

<table>
<tr><td>Code: BSE-202</td><td>Second semester</td><td>Database Management System</td><td>Credits: 04</td></tr>
<tr><td colspan="4">Course Objectives:
1. At the completion of this course, students should be able to do the following:
2. Understand the role of a database management system in an organization.
3. Understand basic database concepts, including the structure and operation of the relational data model.
4. Construct simple and moderately advanced database queries using SQL.
5. Understand and successfully apply logical database design principles, including E-R diagrams.
6. Understand the concept of a database transaction and related database facilities.
7. Describe and discuss selected advanced database topics, such as Client Server Parallel & distributed database systems and the data warehouse.</td></tr>
<tr><td colspan="4">Course Outcome:
The learner will be able:
1. To describe data models and schemas in DBMS
2. To understand the features of database management systems and Relational database.
3. To use SQL- the standard language of relational databases.
4. To understand the design of the database & types of database
5. To understand the concept of Transaction and Query processing.</td></tr>
<tr><td>Unit-1:</td><td colspan="3">DBMS Concepts</td></tr>
<tr><td colspan="4">What is Database?, Database Management System (DBMS), Architecture of DBMS – Three level Structure of DBMS. Entity, Attributes, type of relationships, DBMS users, DBMS Facilities, Advantages and Disadvantages of DBMS, Data Models, Database Languages (DDL, DML, DCL, DQL, TCL)</td></tr>
<tr><td></td><td colspan="2"></td><td></td></tr>
<tr><td>Unit-2:</td><td colspan="3">Database Design & the ER Model</td></tr>
<tr><td colspan="4">Overview of the Design Process, Design Phases, The Entity-Relationship Model, Entity Sets, Relationship Sets, Attributes, Constraints, Mapping Cardinalities, Keys, Entity Sets, Relationship Sets, Entity Relationship Diagrams, Weak Entity Sets</td></tr>
<tr><td></td><td colspan="2"></td><td></td></tr>
<tr><td>Unit-3:</td><td colspan="3">Relational Model</td></tr>
<tr><td colspan="4">Structure of Relational Database, Basic Structure, Database Schema, Keys, Query Languages, Fundamentals of Relational Algebra Operations, The Select Operation, The Project Operation, Composition of Relational Operations, The Union Operation, The Cartesian product Operation, Null Values, Modification of the database, Insertion, Updating, Deletion</td></tr>
<tr><td></td><td colspan="2"></td><td></td></tr>
<tr><td>Unit-4:</td><td colspan="3">Introducing MySQL</td></tr>
<tr><td colspan="4">Installing MySQL on Windows, Understanding MySQL directory Structure for Windows Installation, Managing Databases, Creating Databases, Modifying Databases, Deleting Databases, Managing Tables, Creating Tables, Modifying Tables, Deleting Tables, Inserting Data in MySQL Database, Using INSERT Statement to Add Data, Using REPLACE statement to Add Data, Updating Data in MySQL Database, Deleting Data from a MySQL Database, Retrieving Data from a MySQL Database, The SELECT Statement, The SELECT Statement Options, The optional Clauses of a SELECT statement, WHERE, GROUP BY, HAVING, ORDER BY, LIMIT</td></tr>
<tr><td></td><td colspan="2"></td><td></td></tr>
<tr><td>Unit-5:</td><td colspan="3">Operators & Functions in MySQL</td></tr>
<tr><td colspan="4">Creating MySQL Expressions, Operator Precedence, Grouping Operators, Using Operators in Expressions, Arithmetic Operators, Comparison Operators, Logical Operators, Sort Operators Comparing & Converting Data, Comparison Functions, Control Flow Functions, Cast Functions, Managing different types of Data, String Functions, Numeric Functions, Date Functions, Summarizing Data, Summary Functions, AVG (), SUM (), MIN (), MAX (), COUNT () Functions, Bit Functions</td></tr>
<tr><td></td><td colspan="2"></td><td></td></tr>
<tr><td>Unit-6:</td><td colspan="3">Managing Transactions</td></tr>
<tr><td colspan="4">Introducing Transaction, Performing Transaction, Performing a Basic Transaction, START</td></tr>
</table>

TRANSACTION Statement, COMMIT Statement, ROLLBACK Statement, Statement the automatically Commit transaction, Adding SAVEPOINT to a Transaction, The SAVEPOINT Statement, ROLLBACK TO SAVEPOINT statement, Setting AUTOCOMMIT Mode and Transaction Isolation Level, Setting the AUTOCOMMIT Mode, Setting the Transaction Isolation Level, Locking Non transactional Tables, The LOCK TABLES Statement, The UNLOCK TABLES Statement		
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.	Beginning MySQL by Robert Sheldon, Geoff Moes (Wiley Publishing , Inc)	

Code: BSE-203	Second semester	**Programming in C (Part-2)**	Credits: 04
Course Objectives : 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.			
Course Outcome : To describe a function, storage classes, structure, union, string and functions, Pointers, File Handling, Student are able to develop application software.			
Unit-1:	**Function in C**		
Functions in C, What is a function?, User defined functions, Declaration, Definition, Function calling, Types of Function			
Unit-2:	**Storage Classes**		
What is storage Classes, Types of Storage Classes, Call by value , Call by reference, Recursion			
Unit-3:	**Strings in C**		
What is String?, Declaration and initialization, Standard String library functions, Strings and pointers, Array of strings.			
Unit-4:	**Pointers**		
What is Pointer? Pointer declaration, initialization, Pointer to pointer, Arrays and pointers, Functions and pointers, Pointer to function, Dynamic memory allocation, Command Line Arguments			
Unit-5:	**Structures and Unions**		
What is Structures?, Creating structures, Accessing structure members (dot Operator), Array of structures Nested structures, Pointers and structures, Unions			
Unit-6:	**File Handling**		
What is File?, Creating File, Types of File, Operation on File, Random Access to File			
Reference Books			
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)		

Code: BSE-204 A **Elective**	Second semester	**Computational Mathematics**	Credits: 04
Course Objectives: Students will develop problem-solving & critical thinking skills & use these skill to solve complex computational problems			
Course Outcome: Apply mathematical foundation to the discipline of Computer Science			
Unit-1:	**Set Theory**		
Introduction, Definition & type, Equal sets, Subsets, Venn diagram, Set operation, Properties of sets			
Unit-2:	**Mathematical logic**		
Propositions, Logical connectivity & compound statement, Truth values & truth table, Statement pattern & logical equivalence, Tautology, Contradiction, Contingency.			
Unit-3:	**Matrices & Determinants**		
Definition & Types, Equality & transpose of matrices, Algebra of matrices, Definition of determinant, Ad-joint of matrices, Inverse of matrices			
Unit-4:	**Co-ordinate Geometry**		
Introduction, Co-ordinates of a point and quadrants, Distance between two points, Equation of straight line, Slope of line, Equation of circle.			
Unit-5:	**Relation & function**		
Cartesian products, Relation, Function, Domain, Range, Type of function			
Unit-6:	**Graph theory**		
Definition & types of graphs, incidences & degree of vertices, Isomorphism of graphs, Walks, Paths & circuits, Tree, Centre of tree, Binary tree			
Reference Books			
1.	Elements of discrete mathematics, C. L. Liu		
2.	Discrete mathematics, Olympia Nicodemi		
3.	Graph theory, Narsing Deo		
4.	Basic mathematics, Mittal & Agrawal		

Code: BSE-204 B **Elective**	Second semester	**Desktop Publishing (DTP)**	Credits: 04

Course Objectives:

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.

Course Outcome:

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

Unit-1: INTRODUCTION

Introduction to Desk Top Publishing, Introduction to Page Maker Advantages, Using the Mouse, Components of the Page Maker Window

Unit-2: Adobe PageMaker

Opening a Publication, creating a New Document, Setting the Margins, Setting the Page Size, Setting the Page Orientation, The Page Icons, Displaying Master Pages and Master Page Items, Inserting and Removing Pages, inserting a Page, removing a Page, Setting Page Numbers, Saving a New Document.

Unit-3: Working with PageMaker

Introduction of toolbox and different tools, Creating a Advertisement, Publishing, converting in different format, Inserting Image and Symbols, Moving and Rotating Images, Text, Symbols, Grouping and ungrouping the different stories.

Unit-4: Adobe Photoshop

Various Page Measurements, Use of Various Tools, Layer Concepts, Basic Of Type : Control Settings & Placements, Images Contrast, Toning & Colour Correction, Colour Conversions, Cleaning, Repairing & Altering Images, Shadow, Reflection & Dimension, Creating Background, Patterns, Brushes, Texture & Frames, Types Effects, Freehand.

Unit-5: Introduction of CorelDraw

Features of Corel Draw, Corel Draw Interface, Tool Box, Moving from Adobe Illustrator to Corel Draw, Common Tasks

Unit-6: Working with Corel Draw

Selecting Objects, Creating Basic Shapes, Reshaping Objects, Organising objects, Applying color fills and Outlines, Text Tool, Artistic and paragraph text, Formatting Text, Embedding Objects into text, Wrapping Text around Object, Linking Text to Objects, Power of Blends, Distortion, Contour Effects, Envelopes, Lens effects, Transparency, Creating Depth Effects, Power Clips, Working with Bitmaps, Editing Bitmaps, Applying effects on Bitmaps, Printing

Reference Books

1.	Adobe Pagemaker 7.0 Book by Kevin G. Proot
2.	Adobe Photoshop (English, Paperback, Kumar Bittu) Publisher: V&S Publisher
3.	CorelDRAW X7: The Official Guide, Book by Gary David Bouton

Code: BSE-205 A	First semester	**Open Elective**	Credits: 04
University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses			

OR

Code: BSE-205 B	Second semester	**Functional English**	Credits: 04
Course Objectives : 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-1:	**Business Correspondence**		
E-mail Writing: Invitation, job, Essay Writing: Types, Structures etc., Resume, Bio-data, and CV.			
Unit-2:	**Reading Comprehension**		
Basic Approaches for understanding English, Para Jumbles			
Unit-3:	**Practical Grammar**		
Basic usages of Tenses, Auxiliaries (Modal and Primary), Phrasal Verbs			
Unit-4:	**Vocabulary**		
One-word substitution, Idioms and Phrases, Synonyms and Antonyms, Spelling Mistakes			
Unit-5:	**Sentence Formation**		
Sentence Completion/ Fillers, Paragraph Completion, Sentence Improvements, Cloze Test			
Unit-6:	**Day-to-Day-English**		
Describing persons, objects or things, Narrating Pictures, Talking about places and recipes, Expression opinions			
Reference Books			
1.	Modern English Grammar-L. S. Deshpande (creative Publication)		
2.	A Practical English Grammar- A. J. Thomson. (Oxford University)		
3.	Macmillan Foundation English. - R. K. Dwivedi & a. Kumar (Mammalian India Ltd)		
4.	Writing English for You- G. Radhakrishna Pillai (Emerland Publication)		
5.	High School English Grammar & Composition - Wren & Martin (S. Chand)		
6.	Radiance Communication Skills- Editorial Board (SRTM University) Orient Black Swan.		
7.	English Grammer and Composition – Rejendra Pal and Prem Lata Suri (Sultan Chand and Sons)		

OR

Code: BSE-205 B	Second semester	**Corporate English**	Credits: 04
Course Objectives : 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-1:	**Practical usage of English**		
Group Discussion, Seminar and Conference, Interview			
Unit-2:	**Business Communication**		
E-mail and Cover letter writing, Resume and CV, Report writing			
Unit-3:	**Fundamentals of English**		
Articles, Prepositions, Conjunctions, Quantifiers			
Unit-4:	**Basic Structures**		
Phrases, Clauses, Sentence: Basic Structures			
Unit-5:	**Phonetics**		
Vowel Sounds in English, Consonants in English, Phonetic Transcription of the words			
Unit-6:	**Practical English**		
Questioning: Formal and Informal ways, Introducing oneself and others, Oral Presentations			
Reference Books			
1.	Modern English Grammar -L. S. Deshpande (creative Publication)		
2.	A Practical English Grammar - A. J. Thomson. (Oxford University)		
3.	Developing Communication Skills.- Krishna Mohan & Meera Banerji (Macmillan India Ltd)		
4.	Macmillan Foundation English. - R. K. Dwivedi & a. Kumar (Mammalian India Ltd)		
5.	Writing English for You- G. Radhakrishna Pillai (Emerland Publication)		
6.	High School English Grammar & Composition - Wren & Martin (S. Chand)		
7.	Radiance Communication Skills- Editorial Board (SRTM University) Orient Black Swan		

Code: BSE-206	Second semester	**Lab-3: DBMS using - MySQL**	Credits: 02
	Practical List:		

1. Installing MySQL in Windows

2. Study Creating & Managing Databases & Tables in MySQL

- Managing Database
  - Creating Databases, Modifying Databases, Deleting Databases
- Managing Tables
  - Creating Tables, Modifying Tables, Deleting Tables
- Inserting Data in MySQL Database
  - Using INSERT Statement to Add Data, Using REPLACE statement to Add Data
- Updating Data in MySQL Database
- Deleting Data from a MySQL Database

3. Study of Retrieving Data from a MySQL Database

- SELECT Statement, SELECT Statement Options, Optional Clauses of a SELECT , WHERE, GROUP BY, HAVING, ORDER BY, LIMIT

4. Study of Operators in MySQL

- Creating MySQL Expressions
- Operator Precedence
- Grouping Operators
- Using Operators in Expressions
- Arithmetic Operators, Comparison Operators, Logical Operators, Sort Operators

5. Study of Functions in MySQL

- Comparing & Converting Data
  - Comparison Functions
  - Control Flow Functions
  - Cast Functions
- Managing different types of Data
  - String Functions
  - Numeric Functions
  - Date Functions
- Summarizing Data
  - Summary Functions
    - AVG (), SUM (), MIN (), MAX (), COUNT () Functions
- Bit Functions

6. Managing Transactions

- Performing Transaction
  - START TRANSACTION Statement
  - COMMIT Statement
  - ROLLBACK Statement
  - Statement the automatically Commit transaction
- Adding SAVEPOINT to a Transaction
  - The SAVEPOINT Statement
  - ROLLBACK TO SAVEPOINT statement

Code: BSE-207	Second semester	**Lab-4: C Programming Part - 2**	Credits: 02
	Practical List:		

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