VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

Bachelor of Computer Application

Name of Program	Bachelor of Computer Application
Abbreviation	BCA
Duration	3 Years (Regular)
Eligibility	Candidate must have passed standard 12th (H.S.C.) Examination in Science / Commerce stream through Gujarat Higher Secondary Board (G.H.S.E.B.) or any other equivalent board (C.B.S.E. / I.C.S.E.) with English subject. If a candidate has passed H.S.C. Examination from "B" group of science, then he/she is also eligible to get admission.
Objective of the Program	The objective of the program is to open a channel of admission for courses in Computer Science for students who have completed standard 12th (H.S.C.) and are interested in taking computing/IT as a career. The program caters to the needs of the students aspiring to excel in the field of computer science. The program is designed to develop computer professionals versatile in almost all field of computer application. The main emphasis of the course is an applied computer use in various fields.
Program Outcome	It will prepare the aspiring students to become computer programmers who can work in companies at entry level and can also work independently.
Medium of Instruction	English
Program Structure	Semester-wise breakup of the courses is given below:

Semester – I

Course Code	Title	Teaching per Week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
101	Communication Skills	2	0	2	3 Hrs.	70	30	100
102	Mathematics	3	0	3	3 Hrs.	70	30	100
103	Introduction to Computers	4	0	4	3 Hrs.	70	30	100
104	Computer Programming & Programming Methodology	4	0	4	3 Hrs.	70	30	100
105	Office Automation Tools	4	0	4	3 Hrs.	70	30	100
106	Practical	0	12	6	5 Hrs.	140	60	200
	Foundation Electives (to be selected from NCC / NSS / Saptadhara)	0	2	2				
Total		17	14	25		490	210	700

For Practical:

1. Batch Size – 30 Maximum
2. In case of more than 10 students in a batch, separate batch should be considered.
3. The journal should be certified by the concerned faculty and also by the Head of the Department,

failing which the student should not be allowed to appear for the External Practical Examination.

Semester – II

Course Code	Title	Teaching per Week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
201	Organization Structure Behaviour	2	0	2	3 Hrs.	70	30	100
202	Computerised Financial Accounting	3	0	3	3 Hrs.	70	30	100
203	Operating System – I	4	0	4	3 Hrs.	70	30	100
204	Advanced C Programming	4	0	4	3 Hrs.	70	30	100
205	Database Management System (DBMS)	4	0	4	3 Hrs.	70	30	100
206	Practical	0	12	6	5 Hrs.	140	60	200
	Foundation Electives (to be selected from NCC / NSS / Saptadhara)	0	2	2				
Total		17	14	25		490	210	700

For Practical:

4. Batch Size – 30 Maximum
5. In case of more than 10 students in a batch, separate batch should be considered.
6. The journal should be certified by the concerned faculty and also by the Head of the Department, failing which the student should not be allowed to appear for the External Practical Examination.

Programming passing rules	As per University rules.

Course 101: Communication Skills

Course Code	101
Course Title	Communication Skills
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Effective communication is vital for the success in various situations. This course will help students develop and improve English Communication skills.
Course Objective	The objective of this course is to guide/help students in improving their English communication skills.
Pre-requisite	Basic School English
Course Out come	After studying this subject, students will be able to improve their communication skills in English.

Course Content	**Unit 1. Introduction**
	    1.1. Spoken and conversation for Greetings, Requests, Invitation, Permission, Thanks etc.
	    1.2. Basic Sentence patterns
	    1.3. Basic rule of Composition
	    1.4. Vocabulary Development
	    1.5. Paragraph Development
	
	Unit 2. Fundamentals of Grammar
	    2.1. Agreement between Subject and Verb
	    2.2. Model Auxiliary
	    2.3. Active and Passive voice
	    2.4. Conjunction and prepositions
	
	Unit 3. Writing Skills
	    3.1. Guidelines for effective writing
	    3.2. Writing style of application
	    3.3. Personal Resume
	
	Unit 4. Business Letter and Report Writing Skills
	    4.1. Business letter and Memo including Requests, Complaints, Quotation etc.
	    4.2. Technical Report writing
	
	Unit 5. Speaking and Discussion Skills
	    5.1. Components of Effective talk / presentation
	    5.2. Planning of content of a talk / presentation
	    5.3. Use of Visual aids
	    5.4. Effective speaking skills
	    5.5. Discussion skills

Reference Books	1. Handbook of practical Communication skills – Chrisle W. JAICO 2. Basic Managerial Skills for all – S. J. McGrath - PHI 3. Reading to learn – Sheila Smith & Thomas M. Methuen (London) 4. Communication conversation Practice _ Tata McGraw Hill 5. Communication in English – R. P. Bhatnagar & R. T. Bell – Orient Longman 6. Good English – G. H. Vallins – Rups & Co.

	7. Let's talk English – M. I. Joshi
	8. Essentials of Business Communications – Pat & Sons, S. Chand
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 102: Mathematics

Course Code	102
Course Title	Mathematics
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Purpose of this course is to develop mathematical abilities relevant to Computer Science.
Course Objective	The objective of this course is to guide/help students in developing Mathematical Abilities relevant to Computer Science.
Pre-requisite	School Mathematics
Course Out come	After studying this subject, students will be able to develop Mathematical Abilities relevant to Computer Science.

Course Content	**Unit 1. Set Theory**
	    1.1. Introduction
	    1.2. Representation
	    1.3. Operation and its properties
	    1.4. Venn Diagram
	    1.5. Cartesian product and graph
	
	Unit 2. Functions
	    2.1. Definition
	    2.2. Types – Domain and Range
	    2.3. Construction and functions
	
	Unit 3. Mathematical Logic
	    3.1. Introduction to logic
	    3.2. Truth Table
	
	Unit 4. Boolean Algebra
	    4.1 Definition & Examples of Boolean Algebra
	    4.2 Boolean Functions
	    4.3 Representation and minimization of Boolean Functions
	    4.4 Design example using Boolean algebra
	
	Unit 5. Matrices and Determinants
	    5.1. Matrices of order M * N
	    5.2. Row and Column transformation
	    5.3. Addition, Subtraction and multiplication of Matrices
	    5.4. Computation of Inverse
	    5.5. Cramer's Rule
	    5.6. Business Application of Matrices

Reference Books	1. Co-ordinate Geometry – Shanti Narayan 2. Linear Algebra – Sushoma Verma 3. Advanced Mathematics – B.S. Shah & Co. 4. Schaum's Outline of Boolean algebra and switching circuits – Elliot Mendelson 5. Digital Computer Fundamentals - Tata McGraw Hill, 6th Edition, Thomas C. Bartee 6. Business Mathematics - Qazi Zameeruddin, V. K. Khanna and S. K. Bhambri, Vikas Publishing House Pvt. Ltd.

Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment.
	70% External assessment.

Course 103: Introduction to Computers

Course Code	103
Course Title	Introduction to Computers
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	A computer is a device that can receive, process and store data. They are used as tools in every part of society together with the Internet. Computers nowadays are complex; there are lot of different components inside them, and they all serve different purposes. They all need to work together for the computer to work; knowing how a computer works makes it easier to use a computer by being able to understand how a computer will respond.
Course Objective	The objective of this course is to provide knowledge of functional units, Number System, devices and memory & its storage.
Pre-requisite	Fundamental Knowledge of Computers
Course Out come	After studying this subject, students will get knowledge of functional units, Number System, devices and memory & its storage.

Course Content	**Unit 1. Introduction**
	   1.1. History of Development
	   1.2. Generation of Computers
	   1.3. Types of Computers-Microcomputers, Minicomputers, Mainframes, Super Computers
	   1.4. Hardware, Software & Firmware
	
	Unit 2. Basic Computer Architecture
	   2.1. Block Diagram & Functional Units
	   2.2. Various hardware components: Mother board, Processor, Memory, ports
	   2.3. Phases of Machine cycle
	      2.3.1. Fetch Cycle
	      2.3.2. Execution Cycle
	   2.4. BIOS, POST
	
	Unit 3. Number Systems
	   3.1. Various number systems (Binary, Octal, Hexadecimal, Decimal)
	   3.2. Conversion among various number systems (Consider all possible combinations from one number system to other number system)
	   3.3. Binary addition & subtraction
	   3.4. Hexadecimal addition & subtraction
	   3.5. Parity Scheme
	   3.6. ASCII Character Code
	
	Unit 4. Memory
	   4.1. Memory organization
	   4.2. Addressing Modes
	   4.3. Memory types: RAM, ROM, FLASH, PROM, EPROM, EEPROM
	   4.4. Concepts of virtual memory, Cache memory

	Unit 5. Storage and I/O Devices
	    5.1. Hard disk and its architecture
	    5.2. Back up Devices (Optical Disc, USB)
	    5.3. Floppy Disks, CD-ROM, DVD ROM
	    5.4. Keyboard, Mouse
	    5.5. Printers:
	        5.5.1.Impact: Dot Matrix, Chain, Drum
	        5.5.2.Non-Impact: Inkjet, Laser
	    5.6. Plotters, Scanners, OCR, OMR
	    5.7. Monitors (CRT, Flat Screen LCD)

Reference Books	1. How computer works: Ron White – Tech media 2. Introduction to Computers – Peter Norton 3. Fundamentals of Computers: V. Rajaraman 4. Introduction to Computer Science – Pearson Education 5. Computer Fundamentals: Pradeep K. Sinha & Priti Sinha (BPB)
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 104: Computer Programming & Programming Methodology

Course Code	104
Course Title	Computer Programming & Programming Methodology
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Computer programming (often shortened to programming) is a process that leads from an original formulation of a computing problem to executable computer programs. Programming involves activities such as analysis, developing, understanding, generating algorithms, verification of requirements of algorithms including their correctness, and implementation (commonly referred to as coding) of algorithms in a target programming language.
Course Objective	The object of this course is to introduce students the rudiments of computer programming and programming methodology using C language.
Pre-requisite	None
Course outcome	The students will be able to formulate a computing problem to executable computer program using C language.

Course Content	**Unit 1. Introduction**
	   1.1 Algorithm and Flowchart
	   1.2 Structured Programming
	   1.3 Concepts of Compiler, Interpreter, Editor, Debugging & Testing
	   1.4 Character Set
	   1.5 Identifiers, Key words, Data types
	   1.6 Constants and Variables – Needs & Definition
	
	Unit 2. Expression & Operators
	   2.1 Operators
	      2.1.1 Arithmetic Operators
	      2.1.2 Unary Operators
	      2.1.3 Relational Operators
	      2.1.4 Logical Operators
	      2.1.5 Assignment Operators
	      2.1.6 Conditional Operator
	   2.2 Expression
	      2.2.1 Arithmetic expression
	      2.2.2 Boolean expression
	   2.3 Evaluation & Assignment of Expression
	
	Unit 3. Input/Output Statements & Built-in Functions
	   3.1. Formatted I/O statements (like *scanf*, *printf*)
	   3.2. Unformatted I/O statements (like *getchar(), getch(), getche(), putchar()*)
	   3.3. Mathematical Functions
	   3.4. String Functions
	   3.5. Conversion Functions
	
	Unit 4. Control Statements
	   4.1. *if* statement
	      4.1.1.Simple *if* statement
	      4.1.2.*if...else* statement

	4.1.3. Nested *if* statement
	4.2. *while loop*
	4.3. *do…while loop*
	4.4. *for loop*
	4.5. *break and continue* statements
	4.6. *switch* statement
	
	Unit 5. Arrays
	  5.1. One Dimensional Arrays
	  5.2. Sorting using One Dimensional Arrays
	  5.3. Concept of Two Dimensional Arrays
	  5.4. String- Array of characters
	  5.5. String Manipulation

Reference Books	1. Programming in C, Balaguruswami – TMH 2. C: How to Program, Deitel & Deitel - PHI 3. C Programming Language, Kernigham & Ritchie - TMH 4. Programming in C, Stephan Kochan - CBS 5. Mastering Turbo C, Kelly & Bootle - BPB 6. C Language Programming – Byron Gottfried - TMH 7. Let us C, Yashwant Kanetkar - BPB Publication 8. Magnifying C, Arpita Gopal - PHI 9. Problem Solving with C, Somashekara - PHI 10. Programming in C, Pradip Dey & Manas Ghosh - Oxford
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 105: Office Automation Tools

Course Code	105
Course Title	Office Automation Tools
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Use of modern office equipment in business or any office is intended to facilitate faster processing and delivery of information, accurate analysis of facts and figures, higher efficiency and productivity, and elimination of fatigue arising from performing repetitive jobs manually. Office Automation Tools help in Word processing, managing Worksheets and preparing Presentations.
Course Objective	The objective of this course is to make students understand and learn various Office Automation Tools like Word processor, Spreadsheet program & Presentation program.
Pre-requisite	Basic Knowledge of Computers
Course outcome	The students will be able to use various Office Automation Tools like Word processor, Spreadsheet software & Presentation software.

Course Content	**Unit 1. Introduction**
	    1.1. Concept of Windows, Icon, Menu
	    1.2. Desktop
	    1.3. Creating Folders and Shortcuts
	    1.4. Finding Files & Folders
	    1.5. Creating, Copying, Moving and Deleting files
	    1.6. Windows Explorer
	    1.7. Basic DOS Commands
	
	Unit 2. Word Processor
	    2.1. Typing, Editing, Proofing & reviewing
	    2.2. Formatting text & Paragraph
	    2.3. Automatics Formatting and Styles
	    2.4. Working with Tables
	    2.5. Graphics and Frames
	    2.6. Mail Merge
	
	Unit 3. Spreadsheet Software
	    3.1. Concept of worksheet
	    3.2. Working & Editing in Workbooks
	    3.3. Creating Formats & Links
	    3.4. Protecting and Hiding data
	    3.5. Built in Functions (Mathematical, Statistical, String & Date)
	    3.6. Formatting a Worksheet
	    3.7. Creating Charts (Graphics), Formatting and Analysing data
	    3.8. Organizing Data in a List (Data Management)
	    3.9. Printing
	
	Unit 4. Presentation Software
	    4.1. Creating and Editing Slides
	    4.2. Creating and Editing objects in the slide
	    4.3. Animation
	    4.4. Creating and Running Slide Show
	    4.5. Templates

	Unit 5. Internet 5.1. Concepts 5.2. Working 5.3. Mailing & surfing tools 5.4. Online Data Backup
Reference Books	1. OpenOffice.org For Dummies - Gurdy Leete, Ellen Finkelstein, Mary Leete - Wiley Pub. 2. Beginning OpenOffice 3: From Novice to Professional - Andy Channellle - Apress Pub. 3. The OpenOffice.org 2 Guidebook - Solveig Haugland 4. Taming Apache OpenOffice: Getting Started - Jean Hollis Weber - Friends of OpenDocument Inc. 5. Open Office Basic: An Introduction - James Steinberg - Gold Turtle Pub. 6. PC Software for Windows 2003 Made Simple, - R K Taxali, - TMH 7. 2007 Microsoft Office System Plain & Simple, Joyce & Moon, - PHI 8. Internet 6 in 1 – Joe Krayuak & Harbraken, PHI 9. Introduction to Computer Science-Pearson Education-ITL ESL 10. Introduction to Computers-Peter Norton-The McGraw-Hill Companies
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 106: Practical

Course Code	106
Course Title	Practical
Credit	6
Teaching per Week	12 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Through practical implementation the students can understand & learn computer programming in a better way.
Course Objective	The objective of this course is to enable students to Solve Practical Problem in Courses 104 & 105.
Pre-requisite	Basic Programming Skills
Course Out come	After completion of this course, the students will be able to write programs in C language and also will be able to use Office Automation Tools.
Course Content	Practical based on Courses 104 and 105.
Reference Book	As per paper numbers 104 and 105
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 201: Organization Structure & Behaviour

Course Code	201
Course Title	Organization Structure & Behaviour
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Computer Science professionals work at different levels in the hierarchy of various jobs in IT. So it is essential to understand the Organization Structure and behaviour.
Course Objective	The objective of this course is to make students aware about the Structure of an Organization and also provide them teaching that leads to better understanding of human behaviour in an organization.
Pre-requisite	Basic Communication Skills
Course Out come	After completion of the course the student will be aware about the Structure of an Organization and also will have better understanding of human behaviour in an organization.

Course Content	**Unit 1. Introduction to Organization and Management**
	    1.1. What makes an organization
	    1.2. Structure of organization
	    1.3. What is Management
	    1.4. Scope of Management
	    1.5. Role of Management
	    1.6. Manager's Role (Interpersonal Role, Information Role and Decisional Role)
	    1.7. Managerial Skills (Technical Skills, Human Skills, Conceptual Skills)
	
	Unit 2. Attitude
	    2.1. Meaning of Attitudes
	    2.2. Characteristics of Attitudes
	
	Unit 3. Motivation
	    3.1. What is motivation?
	    3.2. Nature and Characteristics of Motivation
	    3.3. Importance & Benefits of Motivation
	
	Unit 4. Leadership
	    4.1. What is Leadership?
	    4.2. Characteristics of Leadership
	    4.3. Leadership Styles
	    4.4. Leadership Skills (Technical Skills, Human Skills, Conceptual Skills. Personal Skills)
	
	Unit 5. BPO & Call Centre
	    5.1. What is B.P.O?
	    5.2. What is out-sourcing? Benefits of outsourcing
	    5.3. What is Call Centre?
	    5.4. Call Centre setup & functions

Reference Book	1. Management & Organization Development – By Ahmed Abod Rachna Prakashan, New Delhi 2. Organization Behaviour – By Aplewhite Philip, Prentice hall

	3. Management & Organization Development – By Argyris Chris, McGraw Hill
	4. Human Behaviour at work – By Davis Keeth, Tata McGraw Hill
	5. Organization Behaviour – By L. M. Prasad.
	6. Principles and Practices of Management – By L. M. Prasad.
	7. Managing People at work – By Harris O Jeff, John Wiley & Sons Publication
	8. Call Centres – By S. Pankaj (APII Publication)
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 202: Computerized Financial Accounting

Course Code	202
Course Title	Computerized Financial Accounting
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Accounting takes an important role in operating an organization. Every business must keep track of financial information that relates to its business activities. This course will help students in understand basic concepts of Financial Accounting and also understand working of a good Financial Accounting software.
Course Objective	The objective of this course is to teach basic concepts of Financial Accounting & use of a good Financial Accounting Software
Pre-requisite	None
Course Out come	After learning this subject student will be able to know the basic concepts of Financial Accounting & use of a good Financial Accounting Software.

Course Content	**Unit 1. Introduction to Accounting System**
	    1.1. Meaning & Definition of Accounting
	    1.2. Objectives of Accounting
	    1.3. Concepts and Features of Book Keeping
	    1.4. Branches of Accounting (Financial Management, Cust)
	    1.5. Basis of Accounting (Accrual Bases, Cash Bases)
	    1.6. Accounting Concepts
	
	Unit 2. Accounting Equation & Transaction Analysis
	    2.1. Introduction to Assets, Liabilities, Equities
	    2.2. Concepts of Transaction Analysis
	    2.3. Classification of Accounts (Real Account, Personal Account, Nominal Account)
	
	Unit 3. Concepts of Book-Keeping
	    3.1. Introduction of Single Entry System and its advantages/disadvantages
	    3.2. Introduction of Double Entry System and its advantages
	    3.3. Types of Business Transaction
	        3.3.1. Cash Transaction
	        3.3.2. Credit Transaction
	        3.3.3. Barter Transaction
	    3.4. Concepts of important Terminologies: Opening Stock, Closing Stock, Goods, Inventory, Assets, Liabilities, Capital, Debit, Debtors, Creditors, Income, Expenses, Loss, Profit, Credit, Debit.
	
	Unit 4. Journal & Subsidiary Books (With Preliminary examples)
	    4.1. Meaning of Journal
	    4.2. Format of Journal
	    4.3. Concept and format of cash Book
	    4.4. Concept and format of Petty cash Book
	    4.5. Concept and format of Purchase, Sale, Purchase Return and Sale Return Book
	
	Unit 5. Concept of Accounting Mechanism

	5.1. Meaning and Definition of Ledger 5.2. Types of Ledger 5.3. Trial Balance and its objectives
Reference Book	1. Accounting for Management – By Dr. Hawaharlal 2. Financial Management - By Dr. S. N. Maheshwari 3. Accounting for Management – By S. K. Bhattacharya & John Deardon 4. Advanced Accountancy – By S. P. Jain & K. I. Narang 5. Implementing Tally 6.3 – By K. K. Nathani – BPB Publication 6. Implementing Tally 7.2 – By A. K. Nathani & K. K. Nathani BPB Publication
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 203: Operating System - I

Course Code	203
Course Title	Operating System - I
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	An Operating System (OS) is a software that manages computer hardware and software resources and provides common services for computer programs. The operating system is an essential component of the system software in a computer system. Application programs usually require an operating system to function.
Course Objective	The objective of this course is: 1. To make students understand functionality provided by an Operating System. 2. To make students aware with basic concepts of Windows O. S. Management. 3. To teach device management to the Students.
Pre-requisite	Basic Knowledge of Programming.
Course Out come	After studying this course, students will be able to understand what is the role of an OS; how process management, memory management, and file management is performed by the OS. The students will be able to develop applications that coordinate with the respective OS in a much better way, which is so essential.
Course Content	**Unit 1. Operating System Concepts** 1.1. Evolution of Operating System & History 1.2. Need of an Operating System 1.3. Single User & Multi User Operating System 1.4. Elements of an Operating System 1.5. Operating System as a Resource Manager **Unit 2. Introduction to File System and File Management** 2.1. File Concept 2.2. Operations on File 2.3. File Access Methods (Sequential Access and Direct Access) 2.4. Directory Systems File Management Functions. 2.5. File System and Directory Structure organization. 2.6. File Protection. **Unit 3. Introduction of Linux** 3.1. Introduction of Linux versions 3.2. Components of Linux 3.3. Comparison of Windows and Linux **Unit 4. Linux Administration** 4.1. Installing Linux 4.2. Installation of Open Source Software 4.3. Maintaining User Accounts 4.4. System Config Services (Package) **Unit 5. Device Management** 5.1. Device Management Function 5.2. Device Characteristics 5.3. Disk space Management 5.4. Allocation and Disk Scheduling Methods

Reference Books	1. Operating System Concepts: – James Peterson: – McGraw Hill 2. Operating System: – Stallings - PHI 3. Operating System Principles: – Silberschatz, Galvin, Gagne - Willey, India 4. Operating Systems – A. S. Godbole – Tata McGraw Hill 5. Linux – The Complete Reference – Richard Petersen – Tata McGraw Hill
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 204: Advanced C Programming

Course Code	204
Course Title	Advanced C Programming
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Learn the advanced features of C language that were not covered in earlier semester.
Course Objective	The objective of this course is to introduce to students the advanced topics of C language.
Pre-requisite	Fundamental knowledge of computer programming using 'C' language.
Course Out come	The students will be able to develop program using advanced features of C.

Course Content	**Unit 1. Pre-processor Directives**
	    1.1. Macro Definitions (#define, #undef)
	    1.2. File Inclusion (#include)
	    1.3. Conditional Compilation (#ifdef, #ifndef, #if, #endif, #else, #elif)
	
	Unit 2. Arrays, Structure & Union
	    2.1. Multidimensional Character Array
	    2.2. Defining Structure
	    2.3. Processing Structure
	    2.4. Array of Structure
	    2.5. Self-Referential Structure
	    2.6. Defining Union
	    2.7. Comparison between Structure and Union
	
	Unit 3. User Defined Functions & Pointers
	    3.1. User Defined Functions
	        3.1.1. Definition and Accessing of a Function
	        3.1.2. Function Prototype
	        3.1.3. Recursive Function
	        3.1.4. Call by Value
	        3.1.5. Passing array to user-defined functions
	    3.2. Pointers in C
	        3.2.1. Pointer Variable Declaration & Memory Storage
	        3.2.2. Address and Value Operators
	        3.2.3. Pointer Arithmetic
	        3.2.4. Pointer to Array
	            3.2.4.1. Pointer to One Dimensional Array
	            3.2.4.2. Pointer to Multi-Dimensional Array
	    3.3. Array of Pointer
	    3.4. Passing pointers to functions
	    3.5. Call by Reference
	    3.6. Structure and Pointer
	    3.7. Passing structure to a function
	
	Unit 4. File Handling in C
	    4.1. Types of Files in C
	    4.2. Defining, Opening & Closing a File
	    4.3. Read, Write & Append operations in a File.

	4.4. Reading & Writing Records (Structures) to a File
	4.5. Random Access of Files
	    4.5.1. File positions: *ftell()* and *fseek()*
	    4.5.2. *rewind()*
	    4.5.3. *fflush()*
	
	Unit 5. Other Features of C
	    5.1. Command Line Arguments
	    5.2. Storage Classes & their use
	        5.2.1. Automatic Storage Class
	        5.2.2. Register Storage Class
	        5.2.3. Static Storage Class
	        5.2.4. Extern Storage Class
	    5.3. Enumerated Data Type (*enum*)
	    5.4. Type Definitions (*typedef*)
	    5.5. Bitwise Operators
	        5.5.1. Shift Operators (Right Shift & Left Shift)
	        5.5.2. The AND Operator & AND Masking
	        5.5.3. The OR Operator & OR Masking
	        5.5.4. The XOR Operator & XOR Masking

Reference Books	1. Programming in C, Balaguruswami - TMH 2. C Programming Language, Kernigham & Ritchie - TMH 3. The spirit of C, Cooper H & Mullish H - Jaico Pub. 4. Programming in C, Stephan Kochan - CBS 5. Mastering Turbo C, Kelly & Bootle - BPB 6. C Language Programming, Byron Gottfried -TMH 7. Mastering Turbo C, Stan Kelly – BPB 8. Let us C, Yashwant Kanetkar - BPB Publication 9. Magnifying C, Arpita Gopal - PHI 10. Problem Solving with C, Somashekara - PHI
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 205: Database Management System (DBMS)

Course Code	205
Course Title	Database Management System (DBMS)
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Organizations use large amount of data. A Database Management System (DBMS) is a software tool that makes it possible to organize data in a database.
Course Objective	The objective of this course is: 1. To make students understand the basic concepts of Database. 2. To teach students how to create & manage Databases using Structured Query Language (SQL). 3. To teach Normalization and its importance in DBMS.
Pre-requisite	Basic Operating Knowledge of Computer and Basic Knowledge of Programming.
Course Out come	After studying this, students will get the working knowledge of DDL, DML and DCL. The students will be able to prepare a complete database for their application.

Course Content	**Unit 1. Introduction to Database Systems**
	    1.1. Drawbacks of Conventional File Processing System
	    1.2. Need of Database Management System
	    1.3. Organization of database (Physical, Conceptual, Logical)
	    1.4. Data Models
	        1.4.1. Object based data models: E-R Model
	            1.4.1.1. E-R Diagram
	            1.4.1.2. Entities & entity sets
	            1.4.1.3. Strong & weak entity sets
	            1.4.1.4. Types of relationships
	        1.4.2. Record based data models: Network, Hierarchical & Relational
	        1.4.3. Physical data models
	
	Unit 2. Concepts of DBMS
	    2.1. Components of Data Base Management System
	        2.1.1. Query Language: DDL, DML, TCL
	        2.1.2. Database Users: DBA, Programmer, Other Users
	    2.2. Data Independence: Logical & Physical
	    2.3. Functional Dependencies & Closure of Functional Dependencies
	
	Unit 3. Types of Keys & Data Integrity
	    3.1. Keys: Super Key, Candidate Key, Primary Key, Alternate Key, Foreign Key
	    3.2. Constraints
	        3.2.1. Domain Integrity
	        3.2.2. Referential Integrity
	        3.2.3. Entity Integrity
	
	Unit 4. Normalization
	    4.1. Need of Normalization (Consequences of Bad Design-Insert, Update & Delete Anomalies)
	    4.2. Normalization

	4.2.1. First Normal Form
	4.2.2. Second Normal Form
	4.2.3. Third Normal Form
	4.2.4. BCNF
	
	Unit 5. Open Office Base
	   5.1. Working with databases & tables
	   5.2. Managing Constraints & Relationships
	   5.3. Using SQL Queries

Reference Books	1. Database System Concepts: – Henry F. Korth & Abrahim Silberschatz – McGraw Hill Education 2. Introduction to Database Management System– Bipin C. Desai – Galgotia Publication 3. Principles of database systems – Jeffery Ullman – Galgotia Publication 4. An introduction to Database Systems – C. J. Date – Addison Wesley 5. Introduction to database Management – Navin Prakash -TMH 6. Learn Open Office 3.1 Base – AZIMUTH 7. OpenOffice 3.4 Volume III: Base-Christopher N. Cain, Riley W. Walker-Quantum Scientific Publishing 8. Discovering SQL-A Hands-on Guide for Beginner-Alex Kriegel-Wrox Publication 9. A Conceptual Guide to OpenOffice.org 3-R. Gabriel Gurley (Free E-book)
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course 206: Practical

Course Code	206
Course Title	**Practical**
Credit	6
Teaching per Week	12 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2017
Purpose of Course	Give hands on experience of practical problems.
Course Objective	The Objective of this course is to enable students Solve practical problems in courses 204 & 205.
Pre-requisite	Basic Programming Skills.
Course Out come	After completion of this course, the students will be able to write programs using advanced features of C language and also will understand basic concepts of Database Management System and build small database applications.
Course Content	Practical based on courses 204 and 205.
Reference Book	As per paper numbers 204 & 205
Teaching Methodology	Lab. Work
Evaluation Method	30% Internal assessment. 70% External assessment.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
Bachelor of Computer Application

Program Structure	Semester-wise break up for the courses is given below:							
SEMESTER - 3								

Course Code	Title	Teaching per week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
301	Statistical Methods	2	0	2	3 Hrs	70	30	100
302	Software Engineering-I	3	0	3	3 Hrs	70	30	100
303	Relational Database Management System (RDBMS)	4	0	4	3 Hrs	70	30	100
304	Data Structures	4	0	4	3 Hrs	70	30	100
305	Object Oriented Programming	4	0	4	3 Hrs	70	30	100
306	Practical	0	12	6	5 Hrs	140	60	200
	Foundation Elective (to be selected from NCC / NSS / Saptadhara)	0	2	2				
Total		17	14	25		490	210	700

For Practical:

1. Batch Size – 30 Maximum
2. In case of more than 10 students in a batch, separate batch should be considered.
3. The journal should be certified by the concerned faculty and by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination.

SEMESTER - 4								

Course Code	Title	Teaching per week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
401	Information System	2	0	2	3 Hrs	70	30	100
402	Software Engineering-II	3	0	3	3 Hrs	70	30	100
403	Java Programming	4	0	4	3 Hrs	70	30	100
404	.NET Programming	4	0	4	3 Hrs	70	30	100
405	Web Designing	4	0	4	3 Hrs	70	30	100
406	Practical	0	12	6	5 Hrs	140	60	200
	Foundation Elective (to be selected from NCC / NSS / Saptadhara)	0	2	2				
Total		17	14	25		490	210	700

For Practical:

1. Batch Size – 30 Maximum
2. In case of more than 10 students in a batch, separate batch should be considered.
3. The journal should be certified by the concerned faculty and by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination.

Program Passing Rules	As per University rules.

Course: 301: Statistical Methods

Course Code	301
Course Title	Statistical Methods
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	To develop statistical problems solving abilities relevant to Computer Science.
Course Objective	1. To make students understand various statistical methods. 2. To develop the ability to compute descriptive statistics including diagrammatic representation and interpretation. 3. To be able to carry out simple linear regression analysis.
Pre-requisite	None
Course Out come	Ability to use computers to analyse data.

Course Content	**Unit 1. Introduction and Presentation of statistical data**
	    1.1. Types of variables
	    1.2. Univariate, bivariate and multivariate data
	    1.3. Univariate and bivariate frequency distributions
	
	Unit 2. Measure of central tendency-mean, median and mode
	
	Unit 3. Measures of dispersion (absolute as well as relative)
	    3.1. Mean deviation
	    3.2. Standard deviation
	    3.3. Coefficient of mean deviation and coefficient of variation
	
	Unit 4. Correlation
	    4.1. Introduction
	    4.2. Types of correlation and scatter diagrams
	    4.3. Rank correlation coefficient
	
	Unit 5. Regression
	    5.1. Concept of dependent and independent variables
	    5.2. Introduction to liner regression
	    5.3. Line of regression (with one independent variable)
	
	Methods should be explained conceptually and corresponding examples should be given. No proof should be given to any of the methods.

Reference Book	1. Introduction to mathematical statistics, Hogg R V & Craig A L - Tata McGraw Hill 2. An introduction to the theory of statistics, Yule U G & Kendall MG – C. Griffin & Co. 3. Statistical Methods, S. P. Gupta – Sultan Chand & Co
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 302: Software Engineering-I

Course Code	302
Course Title	Software Engineering - I
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	Computer software engineers apply the principles and techniques of computer science, engineering, and mathematical analysis to the design, development, testing, and evaluation of the software and the systems that enable computers to perform their many applications.
Course Objective	1. To make students understand how to engineer the software. 2. To make students understand various components of software process model and their working. 3. To make students understand the importance of requirement analysis. 4. To make students understand various approaches of system design.
Pre-requisite	Prior knowledge of some software.
Course Out come	After studying this, students will be able to understand how software is engineered and importance of various aspects of software engineering. This course will also help students appreciate the role of various design principles. After successful completion students will be able to perform requirement analysis and system design for their applications.

Course Content	**Unit 1.** Introduction
	  1.1 What is software?
	  1.2 Software characteristics.
	  1.3 Software Engineering: definition.
	
	Unit 2. Software Engineering
	  2.1 Software Applications, Myths.
	  2.2 Software Engineering: Generic View.
	
	Unit 3. Software Process models
	  3.1 Introduction of Waterfall model.
	  3.2 Prototype model.
	  3.3 Spiral Model
	  3.4 Incremental Model
	
	Unit 4. Requirement analysis
	  4.1 Introduction.
	  4.2 Current Application Analysis.
	  4.3 Requirement gathering techniques & Fact Finding, Recording Outcome.
	  4.4 DFD, Data Dictionary and Process Specification.
	  4.5 Importance of Requirement Specifications.
	  4.6 Software Requirement Specification Document.

	Unit 5. System Design
	   5.1 Design model.
	   5.2 Principal and Concepts.
	   5.3 Functional Independence.
	   5.4 Module & Sequence.
	   5.5 Effectiveness of Modular Design.
	   5.6 Mapping of Requirements into Design.
	   5.7 Design Documentation.

Reference Books	1. Software Engineering - A Practitioners' approach, R. S. Pressman – McGraw Hill. 2. Software Engineering concepts, Richard Fairley – McGraw Hill. 3. An Integrated Approach to Software Engineering, Pankaj Jalota – Narosa. 4. Software Engineering a Concise Study, Kelkar – PHI. 5. Fundamentals of Software Engineering, 4th Edition, Rajib Mall – PHI. 6. Software Engineering, Ian Sommerville - Pearson Education. 7. System Analysis & Design in changing world, Satzinger, Jackson, Burd – Course Technology. 8. System Analysis, Design & Introduction to S/W Engineering, Prof. S. Parthasathy & Prof. B. W. Khalkar – Master Academy, Nashik. 9. System Analysis & Design, Elias M – Galgotia Publications. 10. System Analysis & Design, Richard Fairley - Galgotia Publications.
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 303: Relational Database Management System

Course Code	303
Course Title	Relational Database Management System
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	Give fundamental knowledge of Relational Database. The course also includes SQL & PL/SQL.
Course Objective	1. To make students understand Oracle architecture. 2. To make students understand various components of database like Index Triggers etc. 3. To make students understand the importance of database in real world applications. 4. To make students aware of extracting the data in different ways.
Pre-requisite	Basic knowledge of Database Management System (DBMS).
Course Out come	After learning this subject, students will know how to store, retrieve and administer the data easily & efficiently.

Course Content	**Unit 1. Codd's Rules**
	
	Unit 2. SQL
	2.1. Oracle Data Types
	2.2. Oracle DDL Commands (Create Table, Alter Table, Drop Table), DML Commands (Insert, Update, Delete, Select) and TCL Commands (Commit, Rollback, SavePoint) Statements with integrity constraints
	2.3. Special Operators (IN, NOT IN, EXISTS, LIKE)
	2.4. Oracle Functions
	    2.4.1. Scalar Functions (String Functions, Numeric Functions, Date Functions, Conversion Functions)
	    2.4.2. Aggregate Functions
	2.5. Range Searching and Pattern Matching
	2.6. Manipulating Dates
	2.7. Joins
	    2.7.1. Inner Join
	    2.7.2. Outer Join (Left, Right, Full)
	    2.7.3. Cross Join
	2.8. Sub Queries
	2.9. Using Union, Intersection and Minus Clauses
	2.10. Indexes (Create index, Drop Index, Types of Index)
	2.11. Views (Read-only view, Updatable view)
	2.12. Sequences
	
	Unit 3. PL/SQL
	3.1. PL/SQL Block Structure
	    3.1.1. Using Variables, Constants and Data Types
	    3.1.2. User Defined Record
	    3.1.3. Assigning Values to Variables
	    3.1.4. Control Statements (IF...THEN statement, Loop,

	FOR...Loop, While Loop)
	 3.2. Cursor (Explicit, Implicit)
	 3.3. Error handling in PL/SQL
	      3.3.1. Inbuilt Exceptions
	      3.3.2. User Defined Exception
	 3.4. Stored and Local Procedures & Functions
	
	 Unit 4. Database Triggers
	 4.1. Definition of Trigger
	 4.2. Statement level Triggers
	 4.3. Row level Triggers
	
	 Unit 5. Database Packages
	 5.1. Introduction
	 5.2. Components of Package
	 5.3. Create and Invoke Package

Reference Book	1. The Complete Reference, George Koch, Kevin Loney – Oracle Press 2. Database Management System, Oracle, SQL and PL/SQL, 2nd ed., Das Gupta & Radha Krishna, PHI 3. Oracle 9 PL/SQL Programming, Scott Urman – Oracle Press 4. Oracle SQL: The Essential Reference, David C. Kreines – O'Reilly 5. SQL, PL/SQL: The Programming Language of Oracle, Ivan Bayross – BPB 6. Oracle PL/SQL Programming – Feuerstein & Peribyl – SPD O'Reilly 7. Learning Oracle SQL and PL/SQL: A Simplified Guide, Chatterjee – PHI
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 304: Data Structures

Course Code	304
Course Title	Data Structures
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	It is important for a computer programmer to understand the storage representation and implementation of various data structures used in a computer program. This helps a programmer to use various data structures efficiently which in turn makes the program efficient. This course introduces various data structures, their storage representation & implementation.
Course Objective	1. Get detailed knowledge of basic data structures, role and importance of data structures in computer programming. 2. Distinguish the key difference between storage & implementation of various data structures. 3. Recognize the problem properties and determine the use of appropriate data structures in different real-world applications. 4. Learn and compare various searching & sorting techniques.
Pre-requisite	This course requires 1. Problem-solving, design and implementation skills. 2. Basic knowledge of programming language.
Course outcome	Students will be able to 1. Implement various operations of data structures and utilities using algorithm. 2. Select appropriate methods for organizing data files and implement file-based data structures.

Course Content	**Unit 1.** Introduction to data structures
	  1.1 Definition
	  1.2 Types of Data Structure
	      1.2.1 Primitive Data Structures
	      1.2.2 Non-primitive Data Structure (Linear and Non-Linear)
	  1.3 Storage representation of primitive data structure (integer and character)
	
	Unit 2. Non-Primitive Linear Data Structures
	  2.1 Arrays – its storage structure and Operations (insertion and deletion)
	  2.2 Stack
	      2.2.1 Stack operations
	      2.2.2 Applications of Stack (Recursion and Polish notations)
	  2.3 Queue
	      2.3.1 Types of Queues (Simple, Circular, Double-ended and Priority)
	      2.3.2 Operations on Queue
	      2.3.3 Application of Queue (Simulation)
	  2.4 Linked list
	      2.4.1 Types of Linked lists (Singly, Doubly, Circular)

	2.4.2 Operations on Linked list
	
	2.4.3 Applications of Linked list (Polynomial manipulation)
	
	Unit 3. Non-Primitive Non-Linear Data Structures
	3.1 Definition of Graph
	3.2 Concept and Definition of Tree
	3.3 Types of Binary Tree (Ordinary/Simple, Strictly and Complete Binary tree)
	3.4 Operations on Binary tree (Traversals, Insertion and Deletion)
	3.5 Storage representation of Binary tree (Linked, Sequential and Threaded)
	3.6 Binary search tree
	3.7 Application of tree (Manipulation of arithmetic expression)
	
	Unit 4. Searching & Sorting Techniques
	4.1 Introduction
	4.2 Searching Techniques (Sequential and Binary)
	4.3 Types of Sorting Techniques (Insertion, Selection, Quick, 2-Way Merge and Bubble)
	
	Unit 5. Balance trees
	5.1 Introduction
	5.2 Balance trees
	      5.2.1 AVL tree
	      5.2.2 2-3 tree

Reference Books	1. An Introduction to Data Structures with applications, Trembley – Tata McGraw Hill. 2. Algorithms – Data structure programs, Wirth Niclaus - PHI. 3. Data structures – A Programming Approach with C, Dharmender Singh Kushwaha and Arun Kumar Misra – PHI. 4. Fundamentals of Data structures, Horwitz E. and Sahni – Computer Science Press 5. Schaum's outline of Data Structure with C++, John R. H. - Tata McGraw Hill. 6. Expert Data Structure with C, R. B. Patel - Khanna Publication 7. Data structures - a Pseudocode approach with C++, Richard F. Gilberg and Behrouz A. Forouzan - Thomson books
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 305: Object Oriented Programming

Course Code	305
Course Title	Object Oriented Programming
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	Understand Object Oriented Programming Concepts and skills necessary for developing programs using C++.
Course Objective	1. C++ runs on a variety of platforms, such as Windows, Mac OS, and the various versions of UNIX. This course has been designed for the beginners to help them understand basic to advanced concepts related to C++ Programming language. 2. To make students understand the importance of OOP methodology. 3. To make students understand exception handling and file handling. 4. To make students understand various types of OOP techniques.
Pre-requisite	Basic understand of Computer program and C programming language.
Course Out come	After studying this, students will be able to understand how OOP principles work and importance of various coding techniques of OOP. This course will also help students appreciate the role of Exception handling and File handling techniques. After successful completion students will be able to follow programming methodology and will understand how to apply it for their application.

Course Content	**Unit 1. Principles of Object Oriented Programming**
	    1.1. Procedure Oriented Programming Vs Object Oriented Programming
	    1.2. Basic concepts of Object Oriented Programming (Encapsulation, Polymorphism etc)
	    1.3. Benefits of Object Oriented Programming
	    1.4. Structure & Classes
	    1.5. Encapsulation and Data Hiding
	    1.6. Constructors
	    1.7. Friend Function
	    1.8. Inline Function
	    1.9. Dynamic Object Creation & Destruction
	    1.10.Destructor
	
	Unit 2. Object Oriented Properties
	    2.1. Introduction to Object Oriented Properties
	    2.2. Abstraction
	    2.3. Inheritance
	        2.3.1. Type of Inheritance
	        2.3.2. Constructors and Destructor Calls during Inheritance
	        2.3.3. Abstract Class
	
	Unit 3. Polymorphism
	    3.1 Static Polymorphism
	        3.1.1 Operator Overloading

	3.1.2 Function Overloading and Type Conversion
	3.2 Dynamic Polymorphism
	    3.2.1 Overriding
	    3.2.2 Virtual Function
	
	Unit 4. Data Files
	    4.1 Manipulators (In-Built, User Defined)
	    4.2 File Modes
	    4.3 File Functions
	    4.4 Error Handling During File Operation
	
	Unit 5. Exception Handling
	    5.1 Introduction to Exception
	    5.2 Try ... Catch

Reference Book	1. Let us C++, Yaswant Kanitkar - TMH Publication 2. Programming with C++, E Balaguruswamy - BPB Publication 3. C++ and Object-Oriented Programming Paradigm, Jana - PHI 4. The Complete Reference C++, Herbert Schildt - TMH 5. The C++ Programming Language, Stroustrup – Addison Wesley 6. OOP in Turbo C++, Robert Lafore - Galgotia Publication 7. C++ Primer, Lippman – Addison Wesley 8. Object Oriented Programming Fundamentals & Applications, Probal Sengupta – PHI
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 306: Practical

Course Code	306
Course Title	Practical
Credit	6
Teaching per Week	12 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	Through practical implementation the students can understand & learn computer programming in a better way.
Course Objective	The Objective of this course is to make students practically learn the concepts taught in Paper nos. 303, 304, 305.
Pre-requisite	Programming in C and DBMS.
Course Out come	After completion of this course, the students will be able to implement practical problems related to Data Structures, RDBMS and Object-Oriented programming.
Course Content	Practical based on Papers 303, 304 and 305
Reference Book	As per papers 303, 304 and 305.
Teaching Methodology	Lab. Work
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 401: Information System

Course Code	401
Course Title	Information System
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	Make students aware and understand various types of Information Systems.
Course Objective	1. Learn the different types of Information Systems. 2. To emphasize on the application of information to business management.
Pre-requisite	NIL
Course Out come	After completion of the course the students will understand and appreciate the basic concepts of Information System, importance of MIS for an organization and will be able to contribute effectively in the development and implementation of MIS in different types of organization.

Course Content	**Unit 1. Introduction**
	    1.1. Data & Information
	    1.2. Information need and benefits
	    1.3. Input, Processing, Output and feedback
	
	Unit 2. Concepts of Systems
	    2.1. Definition of system in an organization
	    2.2. Types of systems
	        2.2.1. Deterministic probabilistic systems
	        2.2.2. Open and close systems
	
	Unit 3. Introduction to various Information Systems
	    3.1. Business information Systems
	        3.1.1. Principal Function System in Business
	        3.1.2. Product flow and Information Flow
	        3.1.3. Principal Document Associated with Information Flow
	    3.2. ERP
	    3.3. Management Information Systems
	        3.3.1. Characteristics of MIS
	        3.3.2. Development process of MIS
	    3.4. Decision support systems
	
	Unit 4. Transaction Processing Systems
	    4.1. Overview of Transaction Processing System
	    4.2. Transaction Processing methods & objectives
	    4.3. Transaction Processing Activities
	        4.3.1. Data Collection
	        4.3.2. Data Editing
	        4.3.3. Data correction
	        4.3.4. Data Manipulation
	        4.3.5. Data Storage

	4.3.6. Document Production and Reports
	4.4. Traditional transaction processing Applications
	    4.4.1. Order Processing Systems
	    4.4.2. Purchase Systems
	    4.4.3. Accounting Systems
	
	Unit 5. Case Studies Based on TPS
	    5.1. Online Admission Process, Hospital Management and Hotel Management.

Reference Book	1. Principles of information system, Ralf M. Stair & George W. Reynolds - Thomson Learning Publisher. 2. Introduction to system analysis and Design, NCC – Galgotia Publications 3. Management information Systems – Text & Applications, CVS Murthy – HPH 4. Management information Systems – Organization and technology, K. C. Laudan & J.P. Laudan – Prentice Hall India. 5. Management information system, W. S. Jawadekar – Tata McGraw Hill. 6. E-Business and IS Solutions, J. Buffam – Addison Wesley. 7. Decision Support System and Intelligence Systems, Efraim Turban & Jay E. Aronson – Addison Wesley
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 402: Software Engineering – II

Course Code	402
Course Title	Software Engineering-II
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	Computer software engineers apply the principles and techniques of computer science, engineering, and mathematical analysis to the design, development, testing, and evaluation of the software and the systems that enable computers to perform their many applications.
Course Objective	1. To make students understand steps to design the software. 2. To make students understand various ways to test software. 3. To make students aware of importance of documentation.
Pre-requisite	Basic knowledge of Software Engineering.
Course Out come	After learning this subject, students will know the importance of designing, testing and documenting the software.

Course Content	**Unit 1. System Tools and Techniques**
	    1.1. Flow Diagram of Application
	        1.1.1. System Outline Chart
	        1.1.2. System Flow Chart
	        1.1.3. Decision table and Decision Tree
	        1.1.4. Structured Chart (HIPO chart, Warnier–Orr chart)
	    1.2. Output Design
	    1.3. Input Design
	    1.4. UML Diagrams
	        1.4.1. Introduction
	        1.4.2. Class Diagram
	        1.4.3. Use Case Diagram
	
	Unit 2. Information Systems Development
	    2.1. Code Design
	    2.2. Test Data Preparations
	    2.3. Data Creation & Conversion
	
	Unit 3. Software Testing
	    3.1. Testing Fundamentals
	    3.2. Testing Process
	    3.3. White box and Black Box Testing
	    3.4. Unit Testing
	    3.5. Integrated Testing
	
	Unit 4. Application Change Over
	    4.1. Types of Changeover
	    4.2. User Training
	
	Unit 5. System Documentation and Maintenance
	    5.1. Documentation Essentials
	    5.2. Documentation Methods

	5.3. Developer and User Manuals 5.4. Review & monitoring Of Execution 5.5. Application Change Management
Reference Book	1. Software Engineering – A Practitioners' approach, R. S. Pressman – McGraw Hill 2. Software Engineering concepts, Richard Fairley – McGraw Hill 3. System Analysis & Design, Elias M – Galgotia Pub. 4. An integrated approach to software engineering, Pankaj Jalote – Narosa. 5. Software Engineering a Concise Study – Kelkar – PHI 6. System Analysis & Design & Introduction to S/W Engineering, Prof. S. Parthasarthy & Prof. B. W. Khalkar 7. Object Oriented Modelling and Designing with UML, Michael R Blaha & James R Rumbaugh - Pearson
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 403: Java Programming

Course Code	403
Course Title	Java Programming Language
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	To teach Object Oriented Programming (OOP) concepts through programming using Java as the programming language.
Course Objective	1. To make students understand Object Oriented Programming (OOP). 2. To make students understand various inbuilt Java classes and their working. 3. To make students understand the importance of OOP methodology. 4. To make students understand various types of OOP techniques.
Pre-requisite	Prior Knowledge of C/C++
Course Out come	After studying this, students will be able to understand how OOP principles work and importance of various coding techniques of OOP. This course will also help students to appreciate the role of inbuilt classes. After successful completion students will be able to follow programming methodology and how to apply it in their application.

Course Content	**Unit 1. Introduction to Java**
	   1.1. Properties of Java
	   1.2. Comparison of java with C++
	   1.3. Java Compiler
	   1.4. Java Interpreter
	
	Unit 2. Basic Concepts
	   2.1. Identifier, Literals, Operators, Variables
	   2.2. Keywords
	   2.3. Data Types
	   2.4. Branching: If – Else, Switch
	   2.5. Looping: While, Do-while, For
	   2.6. Type Casting
	   2.7. Strings
	      2.7.1. Basic String operations
	      2.7.2. String comparison
	      2.7.3. String Buffer class.
	
	Unit 3. Classes and Objects
	   3.1. Simple Class, Field
	   3.2. Access Controls, Object creation
	   3.3. Construction and Initialization
	   3.4. Methods, this pointer
	   3.5. Overloading Methods & Constructors.
	   3.6. Static members, static block, static class
	   3.7. Inheritance, super, abstract class, overriding methods
	   3.8. Interfaces

	3.8.1. Introduction to Interfaces.
	3.8.2. Interface Declaration.
	3.8.3. Inheriting and Hiding Concepts.
	3.8.4. Inheriting, Overloading and Overriding Methods.
	3.8.5. Interfaces Implementations.
	
	Unit 4. Packages, The Applet Classes
	  4.1. Package Naming, Type Imports
	  4.2. Package Access, Package Contents
	  4.3. Package Object and Specification
	  4.4. Applet Basics, Applet Architecture
	  4.5. Applet skeleton, Applet Display Methods
	  4.6. HTML APPLET Tag (<APPLET>), Applet Viewer
	  4.7. Passing Parameters to Applets
	
	Unit 5. Exceptions
	  5.1. Introduction to Exceptions
	  5.2. Exception Types, User defined Exception
	  5.3. Throw, Throws
	  5.4. Try, Catch and Finally
	  5.5. Thread
	    5.5.1. Introduction to Threads
	    5.5.2. Thread Model
	    5.5.3. Priority of Threads
	    5.5.4. Inter Thread Communication
	    5.5.5. Synchronization

Reference Books	1. Java Programming Language – Ken Arnold James Gosling, David Holmes: –Addison Wesley (Pearson Education) 2. Java – The complete reference, – Herbert Schildt: – Tata McGraw Hill 3. Java 2 From Scratch: – Steven Haines: –PHI. 4. Programming in Java – E-Balaguruswamy: – Tata McGraw Hill 5. Java: How to Program: – Deitel & Deitel: – PHI
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 404: .NET Programming

Course Code	404
Course Title	.NET PROGRAMMING
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	This syllabus has been prepared for the beginners to help them understand basic VB.Net programming. After completing this, students will get a moderate level of expertise in VB .Net programming from where they can take themselves to next levels.
Course Objective	To make students understand VB.Net as simple, modern, object-oriented computer programming language developed by Microsoft to combine the power of .NET Framework and the CLR with the productivity benefits that are the hallmark of Visual Basic. To make students understand basic VB.Net programming and will also take through various advanced concepts related to VB.Net programming language.
Pre-requisite	The students of BCA should have skills in Programming techniques using Object Oriented Concepts.
Course Out come	After studying this course, students will be able to understand the basic concepts of .Net framework and importance of various coding techniques. This course will also help students understand the role of CLR. After successful completion students will be able to follow programming methodology and how to apply it for their application.

Course Content	**Unit 1. Overview of Microsoft .NET Framework**
	    1.1. The .NET Framework
	        1.1.1. Managed Code MSIL, Metadata and JIT Compilation - Automatic Memory Management.
	    1.2. The Common Language Runtime (CLR)
	    1.3. The .NET Framework class Library
	
	Unit 2. Programming in Visual basic .net
	    2.1. IDE
	    2.2. Variables and Data Types
	        2.2.1. Boxing and Unboxing
	        2.2.2. Enumerations
	        2.2.3. Data Type Conversion Functions
	        2.2.4. Statements
	    2.3. String & Date Functions and Methods
	    2.4. Modules, Procedures and Functions
	        2.4.1. Passing variable number of arguments
	        2.4.2. Optional arguments
	    2.5. Using Arrays and Collections
	    2.6. Control Flow Statements
	        2.6.1. Conditional Statements
	        2.6.2. Loop Statements
	        2.6.3. MsgBox and InputBox

	Unit 3. Introduction to Windows controls
	  3.1. Working with Tool Box Controls
	    3.1.1. Common controls - Label, Text Box, Button, Check Box, Radio Button, Date Time Picker, List Box, Combo box, Picture Box, Rich Text Box, Tree View, Tool Tip, Progress bar, Masked Text box, Notify Icon, Link Label, Checked List box
	    3.1.2. Container Controls
	    3.1.3. Data - Data Set, Data Grid
	    3.1.4. Component - Image list, error provider, Help provider, Timer
	  3.2. Working with Menus and Dialogue Boxes
	  3.3. Exception Handling
	    3.3.1. Structured Error Handling
	    3.3.2. Unstructured Error Handling
	
	Unit 4. Object Oriented Programming
	  4.1. Creating Classes, Object Construction & Destruction
	    4.1.1. Properties, Methods, Events
	    4.1.2. Access Specifiers: Public, Private, Protected, Protected Friend
	    4.1.3. Me, MyBase and MyClass keywords
	  4.2. Abstraction, Encapsulation & Polymorphism
	  4.3. Interfaces & Inheritance
	
	Unit 5. Database access using ADO.NET
	  5.1. Visual Database Tools
	  5.2. ADO .NET Object Model
	  5.3. ADO .NET Programming

Reference Book	1. Visual Basic .NET Programming (Black Book) - By Steven Son Holzner, DreamTech Publication 2. Mastering Visual Basic.NET by Evangelos Petroutsos BPB Publication 3. Moving to VB.NET: Strategies, Concepts, and Code - by Dan Appleman – Apress Publication 4. Microsoft Visual Basic .NET Step by Step - by Michael Halvorson, PHI Publication 5. Database Programming with Visual Basic.NET and ADO.NET - by F. Scott Barker – Sams Publication 6. Beginning .NET Web Services Using Visual Basic .NET - by Joe Bustos and Karlli Watson, Wrox Publication 7. .NET – Complete Development Cycle - by G. Lenz, T. Moeller, Pearson Education 8. Professional VB.NET, 2nd Edition - by Fred Barwell, et al – Wrox Publication
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 405: Web Designing

Course Code	405
Course Title	Web Designing
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	Design is the process of collecting ideas, and aesthetically arranging and implementing them, guided by certain principles for a specific purpose. Web design is a similar process of creation, with the intention of presenting the content on electronic web pages, which the end-users can access through the internet with the help of a web browser. This course deals with designing of websites.
Course Objective	To make students aware of web terminology and website development tools. The student can know the real functions of website development.
Pre-requisite	Basic knowledge of Windows based applications. Some very basic acquaintance with computers and the www is assumed.
Course outcome	The students will be able to create, organize and design websites.

Course Content	**Unit 1. Introduction to Html**
	1.1. Difference between HTML and HTML5
	1.2. Structure of HTML page
	1.3. Text Formatting Tags
	1.4. Block Formatting Tags (header, footer, aside, nav, div, h1-h6, p, hr, pre, section, blockquote, abbr)
	1.5. Lists
	1.6. Links and bookmarks
	1.7. Tables
	1.8. Form controls (with HTML5 input types colour, email, url, number, date, range)
	1.9. Frames
	1.10.Image and Image Maps
	1.11.HTML5 Audio & Video Tags
	
	Unit 2. Introduction to CSS
	2.1 Introduction to CSS (What is CSS?, Use of CSS)
	2.2 Benefits of Cascading Style Sheets
	2.3 Applying a style sheet to a document
	    2.3.1. External Style Sheet
	    2.3.2. Importing Style Sheet
	    2.3.3. Embedding style sheet
	    2.3.4. Inline Style
	2.4 Properties: Font, Text, Margin, Border, List, Colour & Background, Box
	
	Unit 3. Java Script
	3.1 Static, Dynamic and Active Page
	3.2 DHTML Events
	    3.2.1 Window, Form, Keyboard, Mouse

	3.3 Java Script
	     3.3.1 Overview of Client & Server-Side Scripting
	     3.3.2 Structure of JavaScript
	     3.3.3 Data Types and Variables
	     3.3.4 Operators: Arithmetic Operator, Assignment Operator,
	           Comparison Operator, Logical Operator, Conditional
	           Operator
	     3.3.5 Control Structure: If…Else, While, Do…While, For
	     3.3.6 Functions
	
	Unit 4. Design Web Sites Using Bootstrap
	    4.1. Bootstrap Introduction
	    4.2. Grid Structure
	    4.3. Table, Colours, Alerts, Form Controls
	    4.4. Buttons and Button Groups
	
	Unit 5. Hosting Web Pages
	    5.1. Domain Name System
	    5.2. Concept of Uploading the Web-site
	    5.3. Protocols
	    5.4. Window based FTP (Upload & Download)
	    5.5. Role of Web Server in Web Publishing
	    5.6. Communication between Web Server & Web Browser

Reference Books	1. Advanced HTML companion – Keith S. & Roberts - AP Professional 2. HTML & CSS: The Complete Reference - Thomas Powell - McGraw Hill Education 3. HTML Unleased, Darnell Rick – Techmedia 4. HTML, XHTML, and CSS Bible - Steven M. Schafe - Wiley Publications 5. Cascading Style Sheets- The Definitive Guide, E. A Meyer – O'Reilly 6. Java Scripting Programming for Absolute Beginner, Harris - PHI 7. JavaScript Step by Step, Suehring - PHI 8. Bootstrap in 24 Hours, Sams Teach Yourself - Jennifer Kyrnin 9. Learning Bootstrap 4 - Matt Lambert - Packt Publishing 10. Bootstrap Responsive Web Development - Jake Spurlock - O'Reilly Media.
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 406: Practical

Course Code	406
Course Title	Practical
Credit	6
Teaching per Week	12 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	June 2018
Purpose of Course	Through practical implementation the students can understand learn computer programming in a better way.
Course Objective	The Objective of this course is to make students practically learn the concepts taught in Paper nos. 403, 404, 405. And using the skills of Papers 404 & 405 develop a small website as a project
Pre-requisite	Programming skill, Relational Database System
Course Out come	After completion of this course, the student will be able to solve practical problems relating to Java and develop a small website using VB .NET, HTML, DHTML.
Course Content	Practical journal should be prepared having minimum 15 practical problems (and in case of Java) should be implemented for practical subject. In Subject P-404 and P-405 .NET Technology and Web designing student must develop a small project which should be assigned by the faculty as a part of practical at the beginning of the semester. The journal should be certified by the concerned faculty and by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination
Reference Book	As per paper numbers 403, 404 & 405
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment. 70% External assessment.

-: પરિપત્ર :-

બી.સી.એ.નો અભ્યાસક્રમ ચલાવતી સંલગ્ન કોલેજોના આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૧૯–૨૦ થી અમલમાં આવનાર B.C.A.(IIIrd year)ના પેટાસમિતિએ તૈયાર કરેલ અભ્યાસક્રમ અંગે કોમ્પ્યુટર સાયન્સ વિષયની અભ્યાસસમિતિની તા.૧૨/૦૩/૨૦૧૯ની સભાનાં ઠરાવ ક્રમાંક: ૨ અન્વયે કરેલ નીચે મુજબની ભલામણ કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાની તા.૨૯/૦૪/૧૯ ની સભાનાં ઠરાવ ક્રમાંક: ૪ અન્વયે સ્વીકારી તે મંજૂર કરવા એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલે તેની તા. ૦૭/૦૬/૨૦૧૯ ની સભાના ઠરાવ ક્રમાંક : ૩૬ અન્વયે મંજૂર કરેલ છે. તેની જાણ સંબંધકર્તા શિક્ષકો અને વિદ્યાર્થીઓને કરવી, તદ્ઉપરાંત તેનો અમલ કરવો.

કોમ્પ્યુટર સાયન્સ વિષયની અભ્યાસસમિતિની તા.૧૨/૦૩/૨૦૧૯ની સભાનાં ભલામણ ક્રમાંક: ૨

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૧૯–૨૦ થી અમલમાં આવનાર B.C.A. (IIIrd year) નો અભ્યાસક્રમ નાના મોટા સુધારા સાથે સર્વાનુમતે મંજૂર કરી તે મંજૂર કરવા કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાની તા.૨૯/૦૪/૨૦૧૯ ની સભાનાં ઠરાવ ક્રમાંક: ૪

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૧૯–૨૦ થી અમલમાં આવનાર B.C.A. (IIIrd year) નો અભ્યાસક્રમ નાના મોટા સુધારા સાથે સર્વાનુમતે સ્વીકારી મંજુર કરવામાં આવે છે અને તે મંજૂર કરવા એકેડેમિક કાઉન્સિલને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૦૭/૦૬/૨૦૧૯ ની સભાનાં ઠરાવ ક્રમાંક: ૩૬

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૧૯–૨૦ થી અમલમાં આવનાર B.C.A. (IIIrd year) નો અભ્યાસક્રમ સ્વીકારી મંજૂર કરવામાં આવે છે.

બિડાણ: ઉપર મુજબ

ક્રમાંક : એકે./પરિપત્ર/૧૦૦૩૪/૧૯
તા.૧૭/૦૬/૨૦૧૯

ઈ.ચા.કુલસચિવ

પ્રતિ,
૧) બી.સી.એ. નો અભ્યાસક્રમ ચલાવતી સંલગ્ન કોલેજોના આચાર્યશ્રીઓ.
૨) ડીનશ્રી, કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખા
૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
.......તરફ જાણ તેમજ અમલ સારૂ.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
Bachelor of Computer Application

Program Structure	Semester-wise break up for the courses is given below:

SEMESTER – 5 (w.e.f. 2019-2020)

Course Code	Title	Teaching per week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
501	PHP & MySQL	4	0	4	3 Hrs	70	30	100
502	UNIX & Shell Programming	4	0	4	3 Hrs	70	30	100
503	Network Technologies	3	0	3	3 Hrs	70	30	100
504	Operating System-II	2	0	2	3 Hrs	70	30	100
505	ASP .NET	4	0	4	3 Hrs	70	30	100
506	Practical	0	12	6	5 Hrs	140	60	200
	Foundation Elective (to be selected from NCC / NSS / Saptadhara)	0	0	2				
Total		17	12	25		490	210	700

For Practical:

1. Batch Size – 30 Maximum
2. In case of more than 10 students in a batch, separate batch should be considered.
3. The practical journal should be certified by the concerned faculty and by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination.

SEMESTER – 6 (w.e.f. 2019-2020)

Course Code	Title	Teaching per week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
601	Computer Graphics	4	0	4	3 Hrs	70	30	100
602	e-Commerce & Cyber Security	3	0	3	3 Hrs	70	30	100
603	Project	0	2 Hrs / Week / 5 Students	14	--	280	120	400
604	Seminar on Information Technology Innovations & Trends	2	0	2	3 Hrs	70	30	100
	Foundation Elective (to be selected from NCC / NSS / Saptadhara)	0	0	2				
Total				25		490	210	700

For Practical:

1. Batch Size – 30 Maximum
2. In case of more than 10 students in a batch, separate batch should be considered.
3. The practical journal should be certified by the concerned faculty and by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination.

Program Passing Rules	As per University rules.

Course: 501: PHP & MySQL

Course Code	501
Course Title	PHP & MySQL
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2019
Purpose of Course	To make students aware of Open Source Web Based Tools and Database
Course Objective	1. To make students understand the concepts of Open Source Web Based Dynamic Scripting Language. 2. To make students understand the concepts of Open Source Database.
Pre-requisite	Basic knowledge of Scripting Language & HTML.
Course Out come	Ability to develop Web Based Applications.

Course Content	**Unit 1. Introduction to PHP and writing PHP code**
	    1.1. Web Communication fundamentals
	        1.1.1. Request-Response
	        1.1.2. Client-side Scripting
	        1.1.3. Session management
	    1.2. Installation & Configuration of PHP and MySQL
	    1.3. How PHP code is parsed
	    1.4. Embedding PHP and HTML
	    1.5. Executing PHP and viewing in Browser
	    1.6. Data types
	    1.7. Operators
	    1.8. PHP variables: Static and Global variables
	    1.9. Comments in PHP
	    1.10. Control Statements
	        1.10.1. Condition Statements
	            1.10.1.1. If…Else
	            1.10.1.2. Switch
	            1.10.1.3. '?' Operator
	        1.10.2. Loops
	            1.10.2.1. While
	            1.10.2.2. Break Statement
	            1.10.2.3. Continue
	            1.10.2.4. Do…While
	            1.10.2.5. For
	            1.10.2.6. For each
	    1.11. Exit, Die, Return
	    1.12. Arrays in PHP
	
	Unit 2. Working with Data and Functions
	    2.1. FORM element, INPUT elements
	    2.2. Validating the user Input
	    2.3. Passing variables between pages through GET, POST and REQUEST
	    2.4. Built-in Functions
	        2.4.1. String Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strrev, echo, print
	        2.4.2. Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand

	2.4.3. Array Functions: count, list, in_array, current, next, previous, end, each, sort, rsort, assort, array_merge, array_reverse
	2.4.4. Date Functions: date, getdate, DateTime::setDate, checkdate, time, mktime
	2.5. User-defined Functions
	
	Unit 3. Sessions, Cookies and Upload Files
	3.1. Concept of Session
	3.2. Starting session
	3.3. Modifying session variables
	3.4. Unregistering and deleting session variable
	3.5. Concept of Cookies and Querystring
	3.6. Upload file form
	3.7. Uploading scripts and restrictions on upload
	3.8. Saving uploaded file
	
	Unit 4. Introduction to MySQL
	4.1. Types of tables in MySQL
	4.2. Query in MySQL: Select, Insert, Update, Delete
	4.3. Order By
	4.4. Database connectivity of PHP with MySQL
	4.5. Functions of MySQL
	
	Unit 5. Introduction to jQuery
	5.1. Syntax Overview
	5.2. Selectors
	5.3. Events
	5.4. Effects
	    5.4.1. Hide
	    5.4.2. Show
	    5.4.3. Fade
	    5.4.4. Slide
	    5.4.5. Animate
	    5.4.6. Stop
	    5.4.7. Callback & Functions
	    5.4.8. Chaining
	5.5. jQuery HTML
	    5.5.1. Get
	    5.5.2. Set
	    5.5.3. Add
	    5.5.4. Remove
	5.6. CSS, Styling & Dimensions
	5.7. Traversing
	    5.7.1. Ancestors
	    5.7.2. Descendants
	    5.7.3. Siblings
	    5.7.4. Filtering

Reference Book	1. Core PHP Programming - Leon Atkinson – Pearson Publishers 2. The Complete Reference PHP - Stever Holzner – McGraw Hill 3. Beginning PHP 5.0 Database - Christopher Scollo, Harish Rawat, Deepak Thomas – Wrox Press 4. Learning jQuery – Jonathan Chaffer, Karl Swedberg – Packt

	Publication 5. jQuery for Dummies – Lynn Beighley – Wiley Publication
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 502: UNIX & Shell Programming

Course Code	502
Course Title	UNIX & Shell Programming
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2019
Purpose of Course	To provide basic knowledge of Multi-User Operating System.
Course Objective	1. To make students aware of basic concepts of Multi-User Operating System. 2. To make students learn Shell Programming.
Pre-requisite	Fundamental knowledge of Operating System.
Course Out come	The students will understand the concepts of Multi-User Operating System and will be able to work with such Operating System. The students will also be able to do shell programming in UNIX environment.

Course Content	**Unit 1. Introduction**
	    1.1. Features of Unix OS
	    1.2. System Structure
	    1.3. Shell & its features
	    1.4. Kernel
	    1.5. Architecture of the UNIX OS
	
	Unit 2. Overview
	    2.1 Logging in & out
	    2.2 I node and File Structure
	    2.3 File System Structure and Features
	    2.4 Booting Sequence & init process
	    2.5 File Access Permissions
	
	Unit 3. Shell Programming
	    3.1 Screen Editor "vi"
	    3.2 Environmental & user defined variables
	    3.3 Argument Processing
	    3.4 Shell's interpretation at prompt
	    3.5 Arithmetic expression evaluation
	    3.6 Control Structure
	    3.7 Redirection
	    3.8 Background process & priorities of process
	    3.9 Conditional Execution
	
	Unit 4. Advanced Shell Programming
	    4.1. Filtering utilities: grep, sed etc.
	    4.2. awk utility
	    4.3. Batch process
	    4.4. Splitting (cat, cut, head and tail), comparing (cmp, comm., diff), Sorting(sort), Merging & Ordering files (paste, uniq)
	
	Unit 5. Communication with other users
	    5.1 write, wall and mesg
	    5.2 mail, motd and news

Reference Books	1. Unix Shell Programming, 3rd Edition, Stephen G Kochan, Patrick Wood – Sams Publishing 2. Unix Shell Programming-3rd edition, Stephen G Kochan & Patrick Wood –Sams Publishing. 3. Sed & awk -2nd edition, Dale Dougherty & Arnold Robbins, - O'Reilly Media. 4. The Unix Programming Environment, Kernigham & Pike –PHI. 5. The Design of the UNIX OS, M. J. Bach – Prentice Hall. 6. Operating Systems, A. S. Godbole –Tata McGraw Hill. 7. Working with UNIX, Vijay Mukhi –BPB Publications. 8. UNIX Shells, Vijay Mukhi –BPB Publications. 9. UNIX System Concepts & Applications, Das –Tata McGraw Hill. 10. UNIX & Shell Programming, Yashwant Kanetkar –BPB Publications.
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 503: Network Technologies

Course Code	503
Course Title	Network Technologies
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2019
Purpose of Course	With extensive use of Internet and Network at offices, it has now become quite essential for students of IT and Computer Science to acquire basic knowledge of Computer Networks. The purpose of this course is to provide basic knowledge of Computer Networks.
Course Objective	Making students aware of 1. Layering Models. 2. Various Network Topologies. 3. Computer Network parlance. 4. Network Security.
Pre-requisite	Prior knowledge of Operating Systems, LAN
Course Out come	After studying this subject, students will be aware of Layering Models, Different types of Computer Networks, Networking terms, Networking Topologies, Networking protocols and Networking Security.
Course Content	**Unit 1. An Introduction to Networks, Network Topologies, and Types** 1.1 Data Communication [Analog, Digital] 1.2 Introduction: Networking 1.3 Information Exchange, Sharing, Preserving & Protecting 1.4 Hardware and Software Resource Sharing 1.5 Need Uses and Advantages of Network 1.6 Clients, Servers, Peers based and Hybrid Networks 1.7 Server types 1.8 Network Topologies (Bus, Star, Ring, Star Bus, Star Ring & Physical Mesh) 1.9 Defining Network Protocols (H/W Protocols, S/W Protocols H/W-S/W Interface) 1.10 Introduction to Wireless Network, Ad-hoc Wireless and Sensor Wireless Network **Unit 2. The Layering Models and Data Communication** 2.1 Introduction to OSI model with all layers 2.2 Differences between OSI Model & TCP/IP model 2.3 Data Communication Model, Digital and Analog data and signals, bit rate, baud, bandwidth, Nyquist bit rate **Unit 3. Networking Hardware** 3.1 Introduction to Guided Transmission Media-Twisted Pair, Coaxial cable, Optical Fibre 3.2 Wireless transmission-Radio waves, microwaves, infrared waves, Satellite Communication. 3.3 Networking devices (repeater, hub, switch, router, bridge, modem) **Unit 4. Basic of TCP/IP Model** 4.1 Introduction to TCP/IP Model

	4.2 Network Access Layer – MAC Address 4.3 Internet Layer – IP Address, IP Subnetting 4.4 Transport Layer - TCP, UDP, Port number 4.5 Application Layer **Unit 5. Network Security: Introductory Concepts and Terminologies** 5.1 Various Types of Securities 5.2 Security with Certificates 5.3 Firewalls
Reference Book	1. Networking Complete – 3rd Edition – BPB Publications 2. Networking Essentials Study Guide – MCSE – Tata McGraw Hill Publication 3. Computer Networks – A S Tanenbaum - PHI 4. Data Communication & Networking – B A Forouzan – Tata McGraw Hill Publication 5. Computer Networks – Bhushan Trivedi – Oxford University Press
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 504: Operating System - II

Course Code	504
Course Title	Operating System – II
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	June 2019
Purpose of Course	To teach advanced functions and concepts of operating system.
Course Objective	To understand various advanced functions and concepts to manage operating system along with scheduling concept.
Pre-requisite	Fundamental Knowledge of Operating System.
Course outcome	Students will get good understanding of various functions and management of operating system.
Course Content	**Unit 1. Processes Management** 　1.1　Process Concept 　1.2　Process Scheduling 　1.3　Scheduling Criteria 　1.4　Scheduling Algorithms **Unit 2. Process Synchronization** 　2.1　Critical Section Problem 　2.2　Producer / Consumer Problem 　2.3　Semaphores 　2.4　Monitors 　2.5　Inter Process Communication 　2.6　Classical IPC Problems 　　　2.6.1　The Dining Philosopher 　　　2.6.2　The Sleeping Barber Problem **Unit 3. Deadlocks** 　3.1　System Model 　3.2　Deadlock Characteristics 　3.3　Methods of Handling Deadlock 　3.4　Deadlock Prevention 　3.5　Deadlock Avoidance 　3.6　Deadlock Detection 　3.7　Recovery from Deadlock **Unit 4. Memory Management** 　4.1　Memory Management Functions 　4.2　Contiguous Memory Allocation 　　　4.2.1　Partitioned Memory 　　　4.2.2　Static and Dynamic Allocation 　4.3　Non-Contiguous Memory Allocation 　　　4.3.1　Paging 　　　4.3.2　Segmentation **Unit 5. Virtual Memory Management** 　5.1　Demand Paging 　5.2　Allocation of Frames 　5.3　Page Replacement 　5.4　Thrashing

Reference Books	1. Operating System Concepts, Silberschatz, Addition Wesley 2. Operating Systems: Internals & Design Principles, William Stallings, PHI 3. Operating System: Design & Implementation, Tenenbaum & Albert Woodhull, Pearson 4. Modern Operating Systems, Andrew S. Tenenbaum, PHI 5. Operating Systems, Donovan M, McGraw Hill Publication 6. Operating Systems: A Design Oriented approach, Crowley, Tata McGraw Hill Publication 7. Operating Systems, S. Godbole, Tata McGraw Hill Publication
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 505: ASP .NET

Course Code	505
Course Title	ASP .NET
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2019
Purpose of Course	To make students aware of Web Based Tools and Database
Course Objective	To make students understand concepts of Web Technology
Pre-requisite	Basic knowledge of Scripting Language & HTML.
Course Out come	Student will get good hands on experience to develop, manage and maintain Web based application.

Course Content	**Unit 1. Introduction to ASP.NET**
	1.1 What is ASP.NET
	1.2 .Net framework 2.0
	1.3 Compile Code
	        1.3.1 Code Behind and Inline Coding
	1.4 The Common Language Runtime
	1.5 Object Oriented Concepts
	1.6 Event Driven Programming
	
	Unit 2. Server Control
	2.1 Post back
	2.2 Data Binding
	        2.2.1 Grid View
	        2.2.2 List Box
	        2.2.3 Data list
	        2.2.4 Data binding Events
	        2.2.5 Repeater
	        2.2.6 Form view
	2.3 Web Server Controls, HTML Server Controls (basic HTML Server Control), Validation Controls, Navigation Controls, Login Control
	2.4 Master Page, Themes & CSS
	
	Unit 3. Database Access
	3.1 Introduction about ADO.NET
	3.2 Introduction about Provider, Adapter, Reader, Command Builder
	3.3 Database Access using ADO.NET
	
	Unit 4. Client Server Communication
	4.1 Communications with Web Browser
	4.2 Response Object
	4.3 Cookies
	4.4 Query String
	4.5 Session Management and Variable Scope
	
	Unit 5. Advance ASP.NET
	5.1 Web.config
	5.2 Sitemappath Server Control
	5.3 User Control

	5.4 User Profile
	5.5 Web Services
	      5.5.1 Basics of Web Services
	      5.5.2 Interacting with web services
	5.6 Error Handling
	      5.6.1 Unstructured Error
	      5.6.2 Structured Error
	      5.6.3 Error handling in Database

Reference Book	1 ASP.NET – A Beginner's Guide by Dave Mercer – TMH 2 ASP.NET Bible – Mridula Parihar et. Al. – Wiley India 3 Programming ASP.NET 4 – Dino Esposito 4 Professional ADO.NET – Bipin Joshi, Donny Mack, Doug Seven, Fabio Claudio Ferracchiati, Jan D Narkiewiez - Wrox 5 ASP.NET for Developers – Amundsen 6 The Complete Reference ASP.NET -Matthew MacDonald –TMH 7 ASP.NET – Black Book – dreamTech 8 Beginning ASP.NET 3.5 in C# and VB –Wrox-Imar Spaanjaars
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 506: Practical

Course Code	506
Course Title	Practical
Credit	6
Teaching per Week	12 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2019
Purpose of Course	Through practical implementation the students can understand learn computer programming in a better way.
Course Objective	The Objective of this course is to enable students Solve Practical Problem in P-501, P-502, P-505.
Pre-requisite	Basic knowledge of scripting language, HTML, Object Oriented Concepts and Java programming.
Course Out come	After completion of this course, the students will be able to implement practical problems in PHP MySQL, UNIX Shell Programming and ASP.NET application.
Course Content	Practical based on Papers 501, 502 and 505
Reference Book	As per papers 501, 502 and 505.
Teaching Methodology	Lab. Work
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 601: Computer Graphics

Course Code	601
Course Title	Computer Graphics
Credit	4
Teaching per Week (Min.)	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.) Total 40 hours
Review / Revision	June 2019
Purpose of Course	Make students aware and understand Computer Graphics.
Course Objective	To make students understand and learn the geometrical processes on various shapes, objects and text.
Pre-requisite	Basic concepts of computer-based animation, various objects and basic school geometry.
Course Out come	Students will be able to understand and write algorithms for construction of various shapes like line, circle & ellipse, and various processes on them.

Course Content	**Unit 1. Introduction**
	  1.1 Application areas of Graphics Systems
	    1.1.1. Presentation Graphics
	    1.1.2. Entertainment
	    1.1.3. Education and Training
	    1.1.4. Image Processing
	  1.2 Computer Graphics Files
	  1.3 Introduction to graphic standards
	
	Unit 2. Graphics Systems
	  2.1. Video Display Devices
	    2.1.1. Refresh CRT
	    2.1.2. Color CRT
	    2.1.3. LCD
	    2.1.4. Direct View Storage Tube
	  2.2. Raster scan and Random Scan Display
	  2.3. Raster Graphics and Vector Graphics
	  2.4. Concepts of various objects: Point, Line, Circle, Ellipse and Polygons
	
	Unit 3. Line generation
	  3.1. Geometry of line
	  3.2. Frame Buffer
	  3.3. Line Drawing Algorithms
	    3.3.1. DDA Algorithm
	    3.3.2. VECGEN
	    3.3.3. Bresenham
	  3.4. Line Styles
	    3.4.1. Thick line
	    3.4.2. Line caps and joint
	  3.5. Anti-aliasing of line
	
	Unit 4. Polygons
	  4.1 Polygon Representation
	  4.2 Polygon Inside Tests
	    4.2.1 Even-odd method
	    4.2.2 Winding number method
	  4.3 Polygon Area Filling Algorithm

	4.3.1 Flood Fill
	4.3.2 Scan Line
	4.3.3 Boundary Fill
	  4.4 Filling polygon with a pattern
	
	Unit 5. Geometric Transformations
	  5.1 Basic Transformations
	    5.1.1 Scaling
	    5.1.2 Translation
	    5.1.3 Rotation
	      5.1.3.1 Rotation about origin
	      5.1.3.2 Rotation about Homogeneous Coordinates
	  5.2 Other transformations
	    5.2.1 Reflection
	    5.2.2 Shearing

Reference Book	1. Computer Graphics - second edition, Donald Hearn & M. Pauline Baker – Tata McGraw Hill Pub. 2. Computer Graphics, Harrington S. -Tata McGraw Hill. 3. Computer Graphics, Desai A. A. –PHI. 4. Computer Graphics: Algorithms & Implementations, Mukherjee & Jana – PHI. 5. Interactive Computer Graphics, Giloi W. K. –Prentice Hall India. 6. Principles of Interactive Computer Graphics, New Man W. & Sproul P. F. –McGraw Hill 7. Procedural Elements for Computer Graphics, Rogers D. F. – McGraw Hill.
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 602: e-Commerce and Cyber Security

Course Code	602
Course Title	e-Commerce and Cyber Security
Credit	3
Teaching per Week (Min.)	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.) Total 30 hours
Review / Revision	June 2019
Purpose of Course	To make students aware of e-Commerce, Cyber Security, Cyber Crime and Cyber Laws
Course Objective	To impart basic knowledge of e-Commerce, Cyber Security, Cyber Crime & Cyber Law
Pre-requisite	Fundamental Knowledge of Networking, Web Applications & RDBMS
Course Out come	The students will get the basic knowledge of e-Commerce, Cyber Security, Cyber Crime & Cyber Law and hence will help them in developing secured applications and will make them aware of various Cyber Laws

Course Content	**Unit 1. Introduction to Electronic Commerce**
	  1.1 What is e-Commerce?
	  1.2 Aims of e-Commerce
	  1.3 e-Commerce Framework
	  1.4 e-Commerce Consumer Applications
	  1.5 e-Commerce Organizational Applications
	  1.6 Introduction to m-Commerce
	
	Unit 2. The Network Infrastructure of e-Commerce
	  2.1. What is Information Way?
	  2.2. Components of I-Way
	      2.2.1. Network Access Equipment
	      2.2.2. Local on-ramps
	      2.2.3. Global Information Distribution Network
	  2.3. Transaction Models
	
	Unit 3. e-Commerce Payments and Security Issues
	  3.1. e-Commerce Payment Systems
	      3.1.1. Debit Card Based
	      3.1.2. Credit Card Based
	      3.1.3. Risks & EPS
	      3.1.4. e-Cash and e-Cheque
	  3.2. Security on Web
	  3.3. SSL
	
	Unit 4. Introduction to Cyber Crimes
	  4.1 Category of Cyber Crimes
	  4.2 Technical Aspects of Cyber Crimes
	      4.2.1 Unauthorized access & Hacking
	      4.2.2 Trojan, Virus and Worm Attacks
	      4.2.3 E-Mail related Crimes
	          4.2.3.1 E-mail Spoofing and Spamming
	          4.2.3.2 E-Mail Bombing
	          4.2.3.3 Denial of Service Attacks
	          4.2.3.4 Distributed Denial of Service Attack

	Unit 5. Prohibited Actions on Cyber Crimes 5.1 Pornography 5.2 IPR Violations: Software piracy, Copyright Infringement, Trademarks Violations, Theft of Computer source code, Patent Violations 5.3 Cyber Squatting 5.4 Banking/ Credit card related crimes 5.5 e-Commerce / Investment Frauds 5.6 Defamation (Cyber Smearing) 5.7 Cyber Stacking
Reference Book	1. Frontiers of Electronic Commerce, Ravi Kalakota and Andrew Whinston, Addition Wesley 2. Electronic Commerce: A Managerial Perspective, Efraim turban, Jae Lee, David King, H. Michel Chung, Addition Wesley 3. E-Commerce: An Indian Perspective, Joseph, PHI 4. E-Mail Hacking, Ankit Fadia, Vikas Publishing House Pvt. Ltd. 5. e-Commerce Concept, Models Strategies, G.V.S. Murthy, Himalaya Publisher 6. Cyber Crime in India, Dr M Dasgupta, Centax Publications Pvt Ltd 7. Cyber Laws and Crimes, Barkha U, Rama Mohan, Universal Law Publishing Co. Pvt Ltd. 8. Cyber Crime, Bansal S.K., A.P.H. Publishing Corporation 9. Cyber Security Understanding Cyber Crime, Computer Forensic and Legal Perspectives, Nina Godbole, Sunit Belapur, Willey India Publication
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 603: Project

Course Code	603
Course Title	Project
Credit	14
Teaching per Week	2 Hrs. / Week / 5 students (Reporting & Contact hours)
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.) 28 hours/week
Review / Revision	June 2019
Purpose of Course	To make students get hands on experience of software development life cycle.
Course Objective	The main objective is to make students acquire knowledge of analyzing and solving real world problems and hands on experience of software development life cycle.
Pre-requisite	Knowledge of Operating System, Computer Networking, Software Engineering, Database, Application Development Tools, Web Designing Related Tools, Computer Languages.
Course Out come	Students will understand the complete process of software development life cycle and will be able to produce good applications of real world problems.
Guidelines for Project	The project will be in-house. Duration of the Project Work should be Two months. All the students will have to submit following reports to their respective examination centres. 1. The Joining Report (Once). 2. Project Title Report (Once). 3. Progress Reports (Fortnightly) signed by the guide (internal faculty) & submitted to the Head/Project Coordinator in person. 4. Project Completion Certificate issued from the College. The student shall not be allowed to appear for the Final Examination if the student fails to submit the above-mentioned documents. Project Viva-voce will be conducted at the end of the semester.
Evaluation Method	30% Internal assessment. 70% External assessment. Internal Evaluation: Minimum two faculties (preferably senior most) should be nominated by the Head of the Department or the senior most faculty in absence of the Head to evaluate the performance of the students' presentation. External Evaluation: The evaluation should be as per the following break up: 1. Analysis: 25% weightage 2. Design: 25% weightage 3. Implementation 25% weightage 4. Presentation: 15% weightage 5. Project Report: 10% weightage

Course: 604: Seminar on Information Technology Innovations & Trends

Course Code	604
Course Title	Seminar on Information Technology Innovations & Trends
Credit	2
Teaching per Week	2
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	June 2019
Purpose of Course	1. To improve the communication and presentation skills. 2. To let students, update knowledge on latest & forthcoming technologies. 3. Let students keep pace with new trends of Information Technology.
Course Objective	Information Technology is a constantly changing field. The idea of introducing this subject is to let students keep pace with the changing scenario of I. T. During the lectures, faculty will help students to select the topic. The students will collect relevant information from various sources and prepare a presentation. During the class hours, students will present their presentation on the given topic. The faculty will access and help them to improve their presentation skills.
Pre-requisite	-
Course Out come	Students will be able to develop their presentation skills and will keep themselves updated with latest trends in Information Technology.
Guidelines for Seminar	Students will prepare a presentation using ICT Tools and submit hard copy of the presentation for Internal and External evaluation.
Evaluation Method	30% Internal assessment. 70% External assessment. Evaluation: External examiners who are appointed for Project evaluation will evaluate the Seminar Presentation, along with the project presentations and will be treated as External Evaluation. Minimum two faculties (Preferably senior most) nominated by the Department Head or the Senior most faculty, in absence of the Department Head, will evaluate the performance of the student's presentation and will be treated as Internal Evaluation. The evaluation should be as per the following break up: 1. Selection of the Topic & Relevance: 20% weightage 2. Understanding of the topic: 35% weightage 3. Source of the topic: 10% weightage 4. Presentation: 35% weightage