Syllabi & Scheme of Examination
Learning Outcomes based Curriculum Framework

For

BSc Data Science (Four Year Degree Programme)
In line with NEP-2020

Department of Computer Science & Engineering

Faculty of Engineering & Technology

Chaudhary Devi Lal University

Sirsa-125055, Haryana

2022

Contents

1. About the Department

The Department of Computer Science and Engineering was established in the year 2000 at the time when the University used to be the Postgraduate Regional Centre of Kurukshetra University, Kurukshetra. The Department offers instructions in Doctor of Philosophy (PhD), Master of Technology in Computer Science and Engineering (Regular) Full-Time, Master of Technology in Computer Science and Engineering (Regular) Part-time, Master of Computer Applications, apart from the programmes proposed to start from session 2022-23, namely, Master of Science in Computer science (Data Science and Artificial Intelligence), Bachelor of Technology in Computer Science and Engineering (Artificial Intelligence and Machine Learning), Bachelor of Computer Applications 4-Year, Diploma in Cyber Security, and Diploma in Digital Marketing. 2021-22 session onward, all the programmes are offered under Learning Outcome based Curricular Framework.

2. Learning Outcomes based Curriculum Framework

The Choice Based Credit System (CBCS) which was introduced in the University effective from academic session 2016-17 for postgraduate programmes and graduate programmes running only in the University campus. Scope of CBCS was expanded from academic session 2017-18. Effective from session 2021-22, 2021-22 session onward, all the programmes of the Department are offered in Learning Outcome based Curricular Framework, wherein every programme of study have Programme Educational Objectives – wherein, it is mentioned that "where does the Department see its graduates after a four to five years of completion of programme?" Further, every programme has its listed outcomes mentioning "What skills the graduates are expected to possess upon completion of the programme?" Further, every programme of study comprises of courses of study and each course has its slated outcomes – the skill and knowledge that a student is expected to possess upon completion of a specific course.

2.1 Objectives of the Programme

The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software. It helps students analyse the requirements for system development and exposes students to business software and information systems. This programme provides students with options to specialize in legacy application software, system software or mobile applications. Following tangible objectives are expected from the programme:

1. To produce outstanding IT professionals who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
2. To provide opportunity for the study of modern methods of information processing and its applications.
3. To develop among students the programming techniques and the problem- solving skills through programming
4. To prepare students who wish to go on to further studies in computer science and related subjects.
5. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

2.2. Programme Outcomes (POs)

At the time of completion, the BSc Data Science graduates are expected to possess the following generic graduate attribute:

1. **Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varyingcomplexity
2. **Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. **Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.
4. **Programming a computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.
5. **Application Systems Knowledge**: Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.
6. **Modern Tool Usage:** Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.
7. **Communication:** Must have a reasonably good communication knowledge both in oraland writing.
8. **Project Management:** Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.
9. **Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrity

in a working environment and also have concern on societal impacts due to computer-based solutions for problems.

10. **Lifelong Learning:** Should become an independent learner. So, learn to learn ability.
11. **Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.

2.3 Programme Specific Outcomes (PSOs)

The fresh graduates of the BSc Data Science programme will have the following discipline-specific graduate attributes:

1. Apply standard Software Engineering practices and strategies in real -time software project development
2. Design and develop computer programs/computer -based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.
3. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems
4. The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
5. The ability to work independently on a substantial software project and as an effective team member.

3. Programme Structure

BSc Data Science - four-year (8-semester) graduate programme shall comprise of Discipline Specific Core Courses (CC), Discipline Specific Elective Courses (DSC), Skill Enhancement Courses (SEC), Ability Enhancement Courses (AEC), and Generic Elective Courses (GEC).

Table 1. Courses and Credit Scheme

Semester	Core Courses (CC)		Discipline Specific Elective Courses (DSE)		Skill Enhancement Courses (SEC)		Ability Enhancement Compulsory Courses (AEC)		Generic Elective Courses (GEC)		Total Credits
	1	2	3	4	5	6	7	8	9	10	(2+4+6+8+10)
	No. of Courses	Total Credits	No. of Courses	Total Credits	No. of Courses	Total Credits	No. of Courses	Total Credits	No. of Courses	Total Credits	
I	5	13	-	-	-	-	1	3	1	4	20
II	5	13	-	-	1	2	1	3	1	4	22
III	5	13	-	-	1	3	1	2	1	4	22
IV	5	13	-	-	1	2	1	3	1	4	22
V											
VI											
VII											
VIII											
Sub-total Credits											
Sub-total Credits Percentage											

Table 2. Detailed break-up of Credit Courses

Semester	Core Courses	Discipline Specific Elective Courses	Skill Enhancement Courses	Ability Enhancement Compulsory Courses	Generic Elective Courses	Total Courses
I	CC1 CC2 CC3 CC4 CC5	-	-	AEC1	GEC1	7
II	CC6 CC7 CC8 CC9 CC10	-	SEC1	AEC2	GEC2	8
III	CC11 CC12 CC13 CC14 CC15	-	SEC2	AEC3	GEC3	8
IV	CC16 CC17 CC18 CC19 CC20	-	SEC3	AEC4	GEC4	8
V						
VI						
VII						
VIII						

Table 3.Course code, course title, maximum marks and course credit

Course Code	Course Title	Credit	Int.	Ext.	Total
SEMESTER 1					
BDS/1/CC1	Programming Fundamentals using C	3	25	50	75
BDS/1/CC2	Digital Computer Fundamentals	3	25	50	75
BDS/1/CC3	Office Automation Tools	3	25	50	75
BDS/1/CC4	SW Lab based on CC1	2	-	50	50
BDS/1/CC5	SW Lab based on CC3	2	-	50	50
BDS/1/AEC1	Environmental Studies	3	25	50	75
BDS/1/GEC1	To be opted by students from the pool of Generic Elective Courses of other Departments	4	30	70	100
	Total	**20**	**130**	**370**	**500**
SEMESTER 2					
BDS/2/CC6	Object Oriented Programming using C++	3	25	50	75
BDS/2/CC7	Database Management System	3	25	50	75
BDS/2/CC8	Computational Thinking	3	25	50	75
BDS/2/CC9	SW Lab based on CC6	2	-	50	50
BDS/2/CC10	SW Lab based on CC7	2	-	50	50
BDS/2/AEC2	Hindi	3	25	50	75
BDS/2/SEC1	Digital Fluency	2	-	50	50
BDS/2/GEC2	To be opted by students from the pool of Generic Elective Courses of other Departments	4	30	70	100
	Total	**22**	**130**	**420**	**550**
SEMESTER 3					
BDS/3/CC11	Operating System	3	25	50	75
BDS/3/CC12	Data Structure	3	25	50	75
BDS/3/CC13	Programming in Java	3	25	50	75
BDS/3/CC14	SW Lab based on CC12 using C/C++	2	-	50	50
BDS/3/CC15	SW Lab based on CC13	2	-	50	50
BDS/3/AEC3	Human Values	2	-	50	50
BDS/3/SEC2	E-Commerce	3	25	50	75
BDS/3/GEC3	To be opted by students from the pool of Generic Elective Courses of other Departments	4	30	70	100
	Total	**22**	**130**	**420**	**550**
SEMESTER 4					
BDS/4/CC16	Web Development	3	25	50	75
BDS/4/CC17	Data Mining and Warehousing	3	25	50	75
BDS/4/CC18	Programming in Python	3	25	50	75
BDS/4/CC19	SW Lab based on CC16	2	-	50	50
BDS/4/CC20	SW Lab based on CC18	2	-	50	50
BDS/4/AEC4	Communication Skills	3	25	50	75
BDS/4/SEC3	Cyber Security	2	-	50	50
BDS/4/GEC4	To be opted by students from the pool of Generic Elective Courses of other Departments	4	30	70	100
	Total	**22**	**130**	**420**	**550**

Note: Students shall undergo the internship/industrial training of 4-6 weeks' period during the summer vacation after taking the examination of fourth semester. They shall submit an internship/training report in the Department which shall be evaluated as part of Semester 5.

Table 4: Generic Elective Courses offered by the Department of Computer Science & Engineering for the students of other Departments

#	Course Code	Course Title	Credits	
1	CSE/GEC1/T	Fundamentals of Information Technology	4	
2	CSE/GEC2/T	Windows and Office Automation Tools	3	4
	CSE/GEC2/P	Windows and Office Automation Tools Lab	1	
3	CSE/GEC3/T	Introduction to Cyber Space	3	4
	CSE/GEC3/P	Introduction to Cyber Space Lab	1	
4	CSE/GEC4/T	Information Technology for Lifelong Learning	3	4
	CSE/GEC4/P	Information Technology for Lifelong Learning Lab	1	

Table 5: Different categories of courses (codes, titles, credits)

#	Couse Code	Course Title	Credits
Core Courses			
1	BDS/1/CC1	Programming Fundamentals using C	3
2	BDS/1/CC2	Digital Computer Fundamentals	3
3	BDS/1/CC3	Office Automation Tools	3
4	BDS/1/CC4	Lab based on CC1	2
5	BDS/1/CC5	Lab based on CC3	2
6	BDS/2/CC6	Object Oriented Programming with C++	3
7	BDS/2/CC7	Database Management System	3
8	BDS/2/CC8	Computational Thinking	3
9	BDS/2/CC9	Lab based on CC6	2
10	BDS/2/CC10	Lab based on CC7	2
11	BDS/3/CC11	Operating System	3
12	BDS/3/CC12	Data Structure	3
13	BDS/3/CC13	Programming in Java	3
14	BDS/3/CC14	Lab based on CC12 using C/C++	2
15	BDS/3/CC15	Lab based on CC13	2
16	BDS/4/CC16	Web Development	3
17	BDS/4/CC17	Data Mining and Warehousing	3
18	BDS/4/CC18	Programming in Python	3
19	BDS/4/CC19	Lab based on CC16	2
20	BDS/4/CC20	Lab based on CC18	2
Discipline Specific Elective Courses			
No Discipline Specific Elective Courses are offered in Semester 1, 2, 3, and 4.			
Skill Enhancement Courses			
1	BDS/2/SEC1	Digital Fluency	2
2	BDS/3/SEC2	E-Commerce	3
3	BDS/4/SEC3	Cyber Security	2
Ability Enhancement Compulsory Courses			
1	BDS/1/AEC1	Environmental Science	3
2	BDS/2/AEC2	Hindi	3
3	BDS/3/AEC3	Human Values	2
4	BDS/4/AEC4	Communication Skills	3
Generic Elective Courses to be opted by the students of BSc Data Science			
1	BDS/1/GEC1	To be opted by students from the pool of GEC of other Departments	4
2	BDS/2/GEC2	To be opted by students from the pool of GEC of other Departments	4
3	BDS/3/GEC3	To be opted by students from the pool of GEC of other Departments	4
4	BDS/4/GEC4	To be opted by students from the pool of	4

		GEC of other Departments		
GEC offered by the Department of CSE for students of other Departments				
1	CSE/GEC1/T	Fundamentals of Information Technology	4	
2	CSE/GEC2/T	Windows and Office Automation Tools	3	4
	CSE/GEC2/P	Windows and Office Automation Tools Lab	1	
3	CSE/GEC3/T	Introduction to Cyber Space	3	4
	CSE/GEC3/P	Introduction to Cyber Space Lab	1	
4	CSE/GEC4/T	Information Technology for Lifelong Learning	3	4
	CSE/GEC4/P	Information Technology for Lifelong Learning Lab	1	

FIRST SEMESTER

BDS/1/CC1 Programming Fundamentals using C							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C.

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand the basic programming constructs they can easily switch over to any other language in future.
CO2	understand the control and conditional structure of C language
CO3	understand the concept of storage classes and array the students will be able to develop applications.
CO4	apply the knowledge gained to develop applications.

Unit 1
Programming fundamentals: problem definition, algorithms, flow charts and their symbols, introduction to compiler, interpreter, debuggers, assembler, linker and loader and their inter relationship, Machine-, Assembly-, High Level- Language.

Unit 2
Elements of C: Character set, identifier and keywords, data type, declaration and definition, formatted input/ output, expressions.
Operators: Arithmetic, relation, logical, bit wise, unary, assignment and conditional operators their hierarchy and associatively.

Unit 3
Control statements: selection, sequencing, if and switch statement, Repetition for, while loops, do-while loop, break, continue, go to.

Unit 4
Arrays, functions, including recursive functions, program organization: local and external variables and scope; pointers & arrays.
Strings: strings literals, string variables, I/O of strings, arrays of strings; applications.

Text Books:
1. Using Information Technology, 5th Edi, Brian K Williams & Stacey C. Sawyer, 2003, TMH
2. The C Programming Language by Dennis M Ritchie, Brian W. Kernighan, 1988, PHI.
3. C Programming – A modern approach by K.N. King, 1996, WW Norton & Co.

BDS/1/CC2: Digital Computer Fundamentals							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15	5	5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. To prepare students to perform the analysis and design of various digital electronic circuits.

Course Outcomes	At the end of this course, the student will be able to:
CO1	describe the organization and operation of a computer processor, primary and secondary memory, peripheral devices and to give computer specifications
CO2	Understand and examine the structure of various number systems and its application in digital design.
CO3	Understand, analyze and design various combinational and sequential circuits.
CO4	be able to apply a design application and propose a cost effective solution.

Unit 1

Computer Fundamentals: Definition, Block Diagram along with its components, characteristics & classification of computers.
Memory: Concept of primary & secondary memory, principle of data storage.
Computer hardware & software: I/O devices, definition of software, relationship between hardware and software, types of software.

Unit 2

Computer Languages: Analogy with natural language, machine language, assembly language, high- level language, compiler, interpreter, assembler.
Information Representation: Number Systems, Binary Arithmetic, Fixed-point and Floating-point representation of numbers, BCD Codes, Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Concept of Unicode.

Unit 3

Binary Logic: Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables, Canonical and Standard forms of Boolean functions.

Unit 4

Digital Logic: Basic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates – XOR, XNOR etc. NAND, NOR, AND-OR-INVERT and OR-AND-INVERT implementations of digital circuits, Combinational logics.
Combinational Circuits: Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor, Encoders, Decoders, Multiplexers, Demultiplexers.

Text Books:
1. Sinha, P.K. & Sinha, Priti, Computer Fundamentals, BPB.
2. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
1. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.

Reference Books
2. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
3. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

BDS/1/CC3 Office Automation Tools							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 5 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: Objective of this course is to make the students familiar with the functioning of the Internet, email, web-browsers, and e-commerce; surfing the Internet and downloading contents therefrom; legal and payment issues in e-commerce.

Course Outcomes	At the end of this course, the student will be able to:
CO1	define: installation, basic elements of windows, features of Word processing, Excel, PowerPoint.
CO2	describe: My computer, control panel, accessories in Windows, MS Word features, toolbars, various styles and tools, excel worksheet, data entry, editing, creating graphs, mathematical and statistical functions and formulas.
CO-3	perform: Windows installation, various tools, tables, charts, template in MS Word, Excel & PowerPoint.
CO4	classify: various tabs in MS Word, Excel, PowerPoint, mathematical and statistical functions and formulas in Excel, format and different operations on tables, PowerPoint elements: templates, wizards, views.
CO5	select: various menu options, tools, dialog boxes, slides and slide shows, Windows accessories, control panel, various layouts, various styles.
CO6	design: effective PowerPoint presentations, document creation & report writing in MS Word, statistical data sheets using Excel.

Unit 1
Windows: Installation of Windows, Windows Desktop, My computer, My documents, Network neighbourhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar - System Tray - Quick launch tool bar - Start button - Parts of Windows, Keyboard Accelerators: Key board short keys or hotkeys, Working with Notepad & WordPad, Creating & Editing Images with Microsoft paint, using the Calculator, Personalising Windows.

Unit 2
MS-Word: Working with Documents, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Formatting Documents - Setting Font styles, Font selection- style, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes, page break, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, Drawing - Inserting Clip Arts, Pictures/Files, Tools –Spell Checks, Mail merge, Templates, Printing Documents.

Unit 3
MS-Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus , Working with Spreadsheets-opening, Saving files, setting Margins, Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data, Inserting Data, Insert Cells, Column, rows & sheets, Inserting Functions, Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction,

Multiplication, Division, Exponentiation), Formatting Spreadsheets- Labelling columns & rows, Formatting-Cell, row, column & Sheet, Category - Alignment, Font, Border & Shading, Hiding/ Locking Cells, Working with sheets – Sorting, Filtering, Creating Charts , Tools – Error checking, Spell Checks.

Unit 4

MS-Power-Point: Introduction to presentation – Opening new presentation, Different presentation templates, setting backgrounds, selecting presentation layouts. Creating a presentation-Setting Presentation style, Adding text to the Presentation. Formatting a Presentation-Adding style, Colour, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, tables into presentation, Adding Effects to the Presentation- Setting Animation & transition effect.

Reference Books:
1. Fundamentals of computers - V.Rajaraman - Prentice- Hall of india 2. Microsoft Office 2007 Bible - John Walkenbach,HerbTyson,FaitheWempen,caryN.Prague,MichaelR.groh,PeterG.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd
2. "Computer Concepts Windows and MS Office", Vikas Publishing House ISBN : 8125912398
3. "MS Office in NutShell" Vikas Publishing House ISBN : 8125914463
4. Rathbone Andy, "Windows XP for Dummies", IDG Books India (Published : 9/2001), ISBN : 8126502282.
5. Tyler, Denise, "Windows XP Home And Professional Editions" BPB Publications (Published : 9/2001).

BDS/1/CC4: SW Lab based on CC1							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BDS/1/CC5: SW Lab based on CC3							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BDS/1/AEC1 Environmental Studies							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Ability Enhancement Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 5 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objective of this course is to study about our environment, its layers. Sustainable development of environment how resources related to each other. About various environment pollutions and socio-political issues of environment.

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand ecosystem and its relationship with environment bio cycle.
CO2	understand sustainable development and the concept of renewable resources.
CO3	Design solution about various way to environmental pollutions and their effects
CO4	Apply solution for harmful effects of various pollution in daily life.

Unit 1

Introduction: Definition, scope and importance: Concept of a neat clean environment, Ecology and Environment, Concept of an ecosystem, Its components and their interrelationships, autotrophs and heterotrophs, food chains, food webs and ecological pyramids, energy flow in the ecosystem, biogeochemical cycles, The concept of biosphere, ecosystem diversity and biodiversity, Global and national concerns, threats to biodiversity and conservation efforts.

Unit 2

Sustainable development: The apparent conflict between economic development and sanctity of the environment, Judicious use of resources for their long term viability; forest resources, water resources, mineral resources; food resources, energy resources and land resources, Renewable sources, the practice of 3Rs.

Unit 3

Environmental pollution: Air pollution, attributes of air environment; major pollutants, their natural and anthropogenic sources, effects and mitigation measures

Water pollution: attributes of water environment, major categories of pollutants; effects and mitigation measures.

Land pollution: Urban and industrial solid wastes and their management.

Noise pollution: Measurement, effects and control of noise pollution.

Unit 4

Socio-political issues: Global concerns, international endeavours and intergovernmental efforts: climate change, global warming, acid rain, ozone layer depletion, international bodies and protocols, Environmental laws and regulations in India.

Text books:
1. Odum, Eugene P. Fundamentals of ecology. Philadelphia: W. B. Saunders Company, 1953.
2. Peary, Rowe, Tchobanoglous Environmental Engineering, McGraw Hill

Reference Books:
1. Heywood and Waston, Global Biodiversity Assessment, CPCB.

SECOND SEMESTER

BDS/2/CC6 Object Oriented Programming using C++								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods	
				External	Internal			
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance	
					15	5	5	

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	To learn the fundamental programming concepts and methodologies essential for building good C++ programs. To practice the fundamental programming methodologies in the C/C++ programming languages via laboratory experiences. Microsoft Visual Studio is the programming environment that will be used.
Course Outcomes	After completion of the course, learners will
CO1	define tokens, keywords, identifiers, variable, constant, operators, expression, and string.
CO2	understand and describe control statements.
CO3	implementation of class and objects
CO4	elaborate the concepts of pointer, inheritance and polymorphism

Unit 1
Introduction to OOPs and C++ Element: Introduction to OOPs, Features & Advantages of OOPs, Elements of C++ (Tokens, Keywords, Identifiers, Variable, Constant, Operators, Expression, String).

Unit2
Program Control Statements : Sequential Constructs, Decision Making Construct, Iteration / Loop Construct, Arrays, Functions (User defined Function, Inline Function, Function Overloading), User Defined Data Types (Structure, Union and Enumeration).

Unit 3
Class, Object, Constructor & Destructor: Class, Modifiers (Private, Public & Protected), Data Member, Member Function, Static Data Member, Static Member Function, Friend Function, Object, Constructor (Default Constructor, Parameterized Constructor and Copy Constructor), Destructor.

Unit 4
Pointer, Polymorphism & Inheritance : Pointer (Pointer to Object, this Pointer, Pointer to Derive Class), Introduction to Polymorphism (Runtime Polymorphism, Compile time Polymorphism), Operator Overloading, Virtual Function, Inheritance (Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance), Virtual Base Class, Abstract Class.

Text books:
1. Object Oriented programming with C++ : E. Balaguruswami.
2. Success with C++: Kris James.
3. Object Oriented programming with C++: David Parsons.
4. Programming in C++: D. Ravichandran.
5. Programming in C++: Dewhurst and Stark.
6. Mastering C++: Venugopal, Ravishankar, Rajkumar.

BDS/2/CC7 Database Management System									
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks				Exam Duration	Assessment Methods
				External	Internal				
				50	25				
Core Theory	03	03	Lecture	50	25			3 Hours	TEE/MTE/ Assignment/ Attendance
					15	5	5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	To explain basic database concepts, applications, data models, schemas and instances, constraints and relational algebra and normalization
Course Outcomes	At the end of this course, the student will be able to:
CO1	define: schema architecture, ER diagrams, functional dependencies, normal forms, data types, views in SQL, concurrency control techniques, semantic data models.
CO2	describe: ER diagram, relational model, EER model, functional dependencies, normal forms, SQL constraints and views, recovery algorithm.
CO3	apply: inheritance, SQL queries, constraints, recovery techniques.
CO4	differentiate: subclass and super class, specialization and generalization, functional dependencies, normal forms.

Unit 1

Basic concepts: a historical perspective, file system vs. DBMS, characteristics of the database approach, abstraction and data integration, database users, advantages and disadvantages of DBMS, implication of database approach.

Database system concepts and architecture: data models, schemas and instances, DBMS architecture and data independence database languages & interfaces, DBMS functions and component modules.

Unit 2

Entity-relationship model: Entity types, entity sets, attributes & keys, relationships, relationship types, E-R diagrams, design of an E-R database schema.

Conventional data models: an overview of network and hierarchical data models.

Relational data model: Relational model concepts, integrity constraints over relations, relational algebra – basic operations.

Unit 3

Relational database design: Functional dependencies, decomposition, desirable properties of decomposition, Normalization, normal forms based on primary keys (1 NF, 2 NF, 3 NF and BCNF).

Unit 4

Transaction processing concepts: introduction to transaction processing, transaction & system concepts, properties of transaction,

Concurrency control techniques: locking techniques, timestamp ordering, multiversion techniques and optimistic techniques.

Recovery techniques: recovery concepts, recovery techniques in centralized DBMS. **Database security**: introduction to database security issues.

Text Books
1. Elmasri & Navathe, Fundamentals of Database System, 3e, Addison Wesley, New Delhi.
2. Korth & Silberschatz, Database System Concept, 4e, McGraw Hill International Edition.
Reference Books
1. C.J. Date, An Introduction to Database System 7e, Addison Western, New Delhi.
2. Abbey Abramson & Cory, ORACLE SI-A Beginner's Guide, Tata McGraw Hill.

BDS/2/CC8 Computational Thinking								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods	
				External	Internal			
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance	
					15	5	5	

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	Thinking or solving problems like computer scientists. CT refers to thought processes required **in** understanding problems and formulating solutions. CT involves logic, assessment, patterns, automation, and generalization
Course Outcomes	At the end of this course, the student will be able to:
CO1	take a complex problem
CO2	understand what the problem
CO3	develop possible solutions
CO4	present these solutions in a way that a computer, a human, or both, can understand

Unit 1
Introduction: Computer, evolutions and classification, components.
Software: Introduction, types of software, operating system and its types, languages and its types, translator and its types.
Hardware: Introduction, types, pointing and positioning devices, firmware.

Unit 2
Input devices: keyboard, point and draw devices, direct data input devices.
Output devices: hard and soft copy (CRT and Flat panel display) output devices.

Unit 3
Number System: Binary number, octal number, Decimal number &Hexadecimal.

Program planning tools: Programming languages, Flowcharts, Algorithms, Pseudo code, decision table, and decision tree.

Unit 4
Networks: Introduction, Internet, Local and Wide Area Networks, Wireless Networking, A Brief Introduction of Network Models and Protocols.
Web: Introduction, A Brief History of Web, Web Server, Web Browser, URLs, Basics of Static and Dynamic Web Pages, Web Search Engine and Web Services.

Text Books:
1. Wang, Paul S. From Computing to Computational Thinking. United Kingdom, CRC Press, 2017.
2. Riley, David D., and Hunt, Kenny A.Computational Thinking for the Modern Problem Solver.United States, Taylor & Francis, 2014.
Reference Books:
1. Kanetkar, Yashavant. Let Us C Solutions. India, BPB Publications, 2018.
2. Forouzan, Behrouz, and Fegan, Sophia Chung. Data Communications Networking McGraw-HilL.
3. Rivest, Ronald L., et al. Introduction to Algorithms. United Kingdom, McGraw-Hill, 2009.
4. Data Structures and Algorithms. India, Pearson Education.

BDS/2/CC9: SW Lab based on CC6							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BDS/2/CC10: SW Lab based on CC7							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BDS/2/AEC2: हिन्दी							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Ability Enhancement Compulsory Course Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 5 5		

सत्रांत परीक्षा के लिए पेपर सेटर के निर्देश: सत्रांत परीक्षा में पाठ्यक्रम की संपूर्ण सामग्री शामिल होगी। प्रश्नों की कुल संख्या नौ होगी। प्रश्न संख्या एक अनिवार्य होगा और इसमें संपूर्ण पाठ्यक्रम से पांच लघु/वस्तुनिष्ठ प्रकार के प्रश्न होंगे। अनिवार्य प्रथम प्रश्न के अतिरिक्त, प्रश्न पत्र में चार इकाइयाँ होंगी जिनमें से प्रत्येक में दो प्रश्न होंगे। छात्र अनिवार्य प्रश्न के अतिरिक्त प्रत्येक इकाई से एक प्रश्न का प्रयास करेगा। सभी प्रश्न समान अंक के होंगे।

पाठ्यक्रम के उद्देश्य: विद्यार्थियों को हिन्दी भाषा और व्याकरण संबंधी जानकारी देना एवं साहित्य इतिहास लेखन के महत्व की जानकारी प्रदान करना।

पाठ्यक्रम के परिणाम	इस पाठ्यक्रम के अंत में, छात्र निम्न में सक्षम होंगे:
CO1	हिन्दी भाषा के बारे में विद्यार्थियों को सामान्य जानकारी देना।
CO2	हिन्दी व्याकरण का ज्ञान उपलब्ध कराना।
CO3	इतिहास व साहित्य इतिहास लेखन की जानकारी प्रदान करना।
CO4	भारतीय इतिहास के परिवर्तन व उसके हिन्दी इतिहास पर पड़े प्रभाव की पहचान होगी।

पाठ्य सामग्री BDS/2/AEC2: हिन्दी	
इकाई– I	वर्ण की अवधारणाएं, हिंदी वर्णमाला का स्वरूप, स्वरों का वर्गीकरण, व्यंजनों का वर्गीकरण
इकाई– II	हिन्दी के व्याकरणिक तत्व, संज्ञा, सर्वनाम, क्रिया, विशेषण
इकाई - III	साहित्य के इतिहास लेखन से अभिप्राय, साहित्य इतिहास दर्शन, हिंदी साहित्य इतिहास की पूर्व पीठिका, हिंदी साहित्य इतिहास लेखन परम्परा
इकाई - IV	vkfndky ds ukedj.k ,oa dky&fu/kkZj.k dh leL;k] vkfndky dh ifjfLFkfr;k¡ ,oa izo`fÙk;k¡

पाठ्य/ सन्दर्भ पुस्तकें	
पाठ्य/सन्दर्भ पुस्तकें	1. सामान्य भाषा विज्ञान, बाबूराम सक्सेना। 2. भाषा विज्ञान की भूमिका, देवेन्द्र नाथ शर्मा। 3. हिन्दी भाषा का इतिहास, धीरेन्द्र वर्मा। 4. हिन्दी साहित्य का इतिहास, लेखक आचार्यरामचन्द्र शुक्ल, प्रका न नागरी प्रचारिणी सभा, का ी (वाराणसी) 1961

BDS/2/SEC1: Digital Fluency							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Skill Enhancement Theory	02	02	Lecture	35	15	3 Hours	TEE/MTE/ Assignment/ Attendance
					10 2.5 2.5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives:	Objective of this course shall be to imbibe the digital fluency skills in the taught, so that s(he) could be well versed with the digital technologies of the day.

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand the concept of computer, internet, and digital media.
CO2	appreciate the applications of computers and digital devices in daily life.
CO3	understand the concepts of virtual learning, digital editing, etc.
CO4	apply the digital media technology in daily life.

Unit I
Basic Computer Concepts and Operations: Basic Computer Concepts and Operations, Computers in Daily Activities, Computer Components, Productivity suites for teaching and learning, Educational Programs and their uses, Basic File Handling Operations, Technology Trends in Education.

Unit II
Internet Fundamentals and Applications: Using the Internet, Internet Applications, Google Advanced Search, Web 2.0 applications for learning, Using Google forms, Internet Ethics and Security

Unit III
Virtual Learning Environments: Basics of Virtual Learning Environment, Virtual Learning Environment systems, Effective usage of Virtual Learning Environment, Investigate the Features of an LMS / VLE / CMS, Example of a Virtual Learning Environment
Multimedia Fundamentals: Multimedia Elements, Multimedia Applications in Education, Multimedia Development Environments, Basic Multimedia Production.

Unit IV
Digital Editing: Learning Objectives, Digital Editing Overview, Digital Content and Media, Digital editing tools, Editing Digital Text, Editing Digital Audio.
Importance of the following: Effective Communication Skills, Creative Problem Solving & Critical Thinking, Collaboration and Teamwork Skills , Innovation & Design Thinking, Use of tools in enhancing skills.

Text Books:
1. S P Sajjan, "Digital Fluency 2021" Ekalavya e-Educate
Reference Books:
1. "Digital Fluency Book", Cambridge Publishing Company Online.

THIRD SEMESTER

BDS/3/CC11: Operating System							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15	5	5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	The objective of this course is to get the students familiar with fundamental concepts of operating systems, namely, types of operating systems, functions of memory management module, process management module, deadlock management and file protection, etc.
Course Outcomes	At the end of this course, the student will be able to:
CO1	outline and define: the goals, functions and types of operating system, interprocess communication, deadlock; identify the techniques of allocation of memory, processor, and disk space.
CO2	describe and discuss: the goals, functions and types of operating system, interprocess communication, deadlock management, techniques of allocation of memory, processor, and disk space.
CO3	illustrate: the concepts of operating system like process scheduling, memory management, virtual memory, directory structure, disk space allocation, and process deadlocks.
CO4	classify: operating systems, deadlock management approaches, process scheduling algorithms, disk scheduling algorithms, page replacement algorithms, directory structure, disk space allocation methods.

Course Objectives: The objective of this course is to get the students familiar with fundamental concepts of operating systems, namely, types of operating systems, functions of memory management module, process management module, and deadlock management & file protection etc.

Course Outcome: Outline and define the goals, functions and types of operating system, interprocess communication, deadlock; identify the techniques of allocation of memory, processor, and disk space.

Unit - I
Operating Systems Overview: Introduction, operating system operations, process management, memory management, storage management, protection and security, distributed systems.
Operating Systems Structures: Operating system services, systems calls and types of system calls, Virtual Machines, Operating systems generations.

Unit - II
Process Management: Process concepts, operations on process, inter-process communication process scheduling criteria, scheduling algorithms
Concurrency And Synchronization: Process synchronization, critical section problem, Peterson's solution, synchronization hardware, semaphores, classic problems of synchronization, readers and writer's problem, dining philosopher's problem, monitors.

Unit III

Deadlocks: System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock banker's algorithm.

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, thrashing.

Unit IV

File System: Concept of a file, access methods, directory and disk structure, file system structure, file system implementation, directory implementation, allocation methods, free-space management.

Secondary-Storage Structure: Overview of Mass-Storage Structure, Disk Structure, Disk Scheduling Algorithms, Disk Management, RAID Structure.

Text Books:

1. Silberschatz A., Galvin P. B., Gagne G., Operating System Concepts, Wiley India Pvt. Ltd.
2. ChauhanNaresh, Principles of Operating Systems, Oxford University Press.
3. Tanenbaum A.S., Operating System- Design and Implementation, PHI Learning.

Reference Books:

1. Deitel H.M., Operating Systems, Pearson Education.
2. Stallings William, Operating System, PHI Learning.
3. Godbole A.S., Operating Systems, Tata McGraw-Hill, New Delhi

BDS/3/CC12: Data Structure							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	To impart the basic concepts of data structures and algorithms. To understand concepts about searching and sorting techniques. To understand basic concepts about stacks, queues, lists, trees and graphs.
Course Outcomes	After completion of the course, learners will
CO1	define complexity and analysis of algorithms
CO2	understand different types of array and stack
CO3	understand different types of queues and linked list and different operations on them
CO4	implement searching and sorting algorithms

Unit 1
Data Structure and algorithm preliminaries: Definitions, Time and Space analysis of Algorithms, Time-Space Tradeoffs, Mathematical Notation and functions, Asymptotic Notations for complexity of algorithms, Recursion, Divide and Conquer Strategy

Unit 2
Array - Single and Multi-dimensional Arrays, Sparse Matrices (Array and Linked Representation),
Stack -Implementing of stack; Prefix, Infix and Postfix expressions, Utility and conversion of these expressions from one to another; Applications of stack.

Unit 3
Queues- Operation on Queues, Circular queue, Priority queues and dequeue.
Linked list – Single, Double, Circular Linked List Implementation.

Unit 4
Trees –Binary tree,Tree Traversals, Binary Search Tree, Threaded Binary Tree ,AVL Trees, Height balanced tree , Heap and its applications.
Searching, Sorting: Searching –Linear Search, Binary Search. Sorting- Bubble sort, Selection sort, Insertion sort, Merge Sort ,Quick Sort, Heap sort,

Reference Books:
1. Seymour Lipschutz, Data Structures, McGraw-Hill Book Company, Schaum's Outline series, NewYork (1986).
2. Narasimha Karumanchi, Data Structures And Algorithms Made Easy, Career Monk.

BDS/3/CC13: Programming in Java								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods	
				External	Internal			
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance	
					15	5	5	

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	The objective of this course is to get the basic concepts and building blocks of Core Java programming languages using the modular approach which emphasizes on small programs. Learn how to write moderately complex programs efficiently. Learn making GUI-based applications in Core Java.
Course Outcomes	By the end of this course, the student will able to:
CO1	outline: programming environment, data types, control constructs, loops, arrays, programming approaches, threads in programming, file system for data storing, data structure library, graphical user interface concepts.
CO2	summarize: programming fundamentals, programming approaches, multithreaded programming, data storing using file system, data structure library, GUI concepts.
CO3	apply: basic programming concepts: to solve basic mathematical operations, data structure operations, concurrent execution of threads, user friendly interfaced programs.
CO4	categorize: data types, programming approaches, flow controls constructs, loops, single and multithreaded programming, various classes in collection framework, GUI controls.

Unit I
Java: Introduction of java, basic concepts, data types, reference types, operators and its types, decision controls, control statements, loops, array, string, functions, boxing & unboxing, scope of variables.

Unit II
OOPS concepts in Java: Encapsulation, class, object, constructors, destructors, polymorphism: function overloading and operator overloading in java, inheritance, interface, abstract class, packages, exception handling.

Unit III
Multithreading in Java: Thread model, multithreading supporting classes and methods, creating single and multiple threaded programs, context switching,

Unit IV
Working with GUI in Java: Containers and components. I/O stream in Java: input and output stream, file handling operations.

Text Books:
1. Darrel Ince& Adam Freeman, Programming the Internet with Java, 2e, Addison Wesley.
2. K.A. Mughal, R.W. Rasmussen, A Programmer's Guide to Java Certification, Addison Wesley.
3. E. Balagurusamy, Programming with Java, 6e, Tata McGraw Hill.

Reference Books:
1. Herbert Schildt, The Complete Reference Java, 10e, Tata McGraw Hill.

BDS/4/CC14: SW Lab based on CC12 using C/C++							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BDS/3/CC15: SW Lab based on CC13							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BDS/3/AEC3: Human Values							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Ability Enhancement Theory	02	02	Lecture	35	15	3 Hours	TEE/MTE/ Assignment/ Attendance
					10 | 2.5 | 2.5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	To create awareness on Ethics & Human Values and to understand the importance of value education in daily lives.
Course Outcomes	On completion of this course, the students will be able to:
CO1	Understand the concept and classification of value education
CO2	Distinguish between self and body, Understand needs and activities in the self and body
CO3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feeling in human-human relationships
CO4	Explore their role in ensuring a harmonious society

Unit: I
Introduction to Value Education: Definition, concept, need and importance of value education, basic guidelines for value education, content and process of value education, Classification of Value Education: understanding personal values, social values, moral values & spiritual values.

Unit: II
Harmony in the Human Being: Human Being is more than just the Body, Harmony of the self with the body, Understanding myself as co-existence of the self and the body, Understanding needs of the self and the needs of the body, Understanding the activities in the self and the activities in the Body.

Unit: III
Harmony in the Family: Family as a basic unit of human interaction and values in relationships, The basics for respect and today's crisis i.e. affection, guidance, reverence, glory, Understanding Values in Human Relationships, understanding harmony in the Family as a basic unit of human interaction, Understanding the set of proposals to verify the Harmony in the Family, Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.
Present Scenario: Differentiation (Disrespect) in relationships on the basis of body, physical facilities, or beliefs. Understanding the Problems faced due to differentiation in Relationships.

Unit: IV
Harmony in the Society: understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive human goals, visualizing a universal harmonious order in society- Undivided Society (Akhand Samaj), universal order (Sarvabhaum Vyawastha) - from family to world family

Text Books
1.   R.R. Gaur, R.Sangal,"A Foundation Course in Human Values and Professional Ethics", 2009
2.   Bhatia R. & Bhatia A,"Role of Ethical Values in Indian Higher Education", 2015

Reference Books
1. A Nagraj, "Jeevan Vidya EkParichay", Divya Path Sansthan, Amarkantak,1998.
2. P.L Dhar, R.R Gaur, "Science and Humanism", Commonwealth Publishers, 1990.
3. A.N Tripathy, "Human Values", New Age International Publishers, 2003.

BDS/3/SEC2: E-Commerce							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Skill Enhancement Theory	03	03	Lecture	05	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 5 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	The objective of this course is to understand concepts of e-commerce, model, framework, EDI and also know various issues of e-commerce.
Course Outcomes	On completion of this course, the students will be able to:
CO1	Understand the concept and type of electronic commerce
CO2	Understand consumer oriented e-commerce and e-tailing
CO3	Understand the concept of electronic data interchange
CO4	Grasp social, ethical, legal and political issues in e-commerce

Unit I

E-commerce and its Technological Aspects: Overview of developments in Information Technology and defining E-Commerce, scope of E commerce, Electronic Market, Electronic Data Interchange, Internet Commerce, Benefits and limitations of E-Commerce, produce a generic framework for E-Commerce, Architectural framework of Electronic Commerce, Web based E- Commerce Architecture.

Unit II

Consumer Oriented E Commerce E-Retailing: Traditional retailing and e retailing, Benefits of e- retailing, Key success factors, Models of e retailing, Features of e retailing. E services: Categories of e-services, Web-enabled services, match making services, Information-selling on the web, e- entertainment, Auctions and other specialized services. Business to Business Electronic Commerce
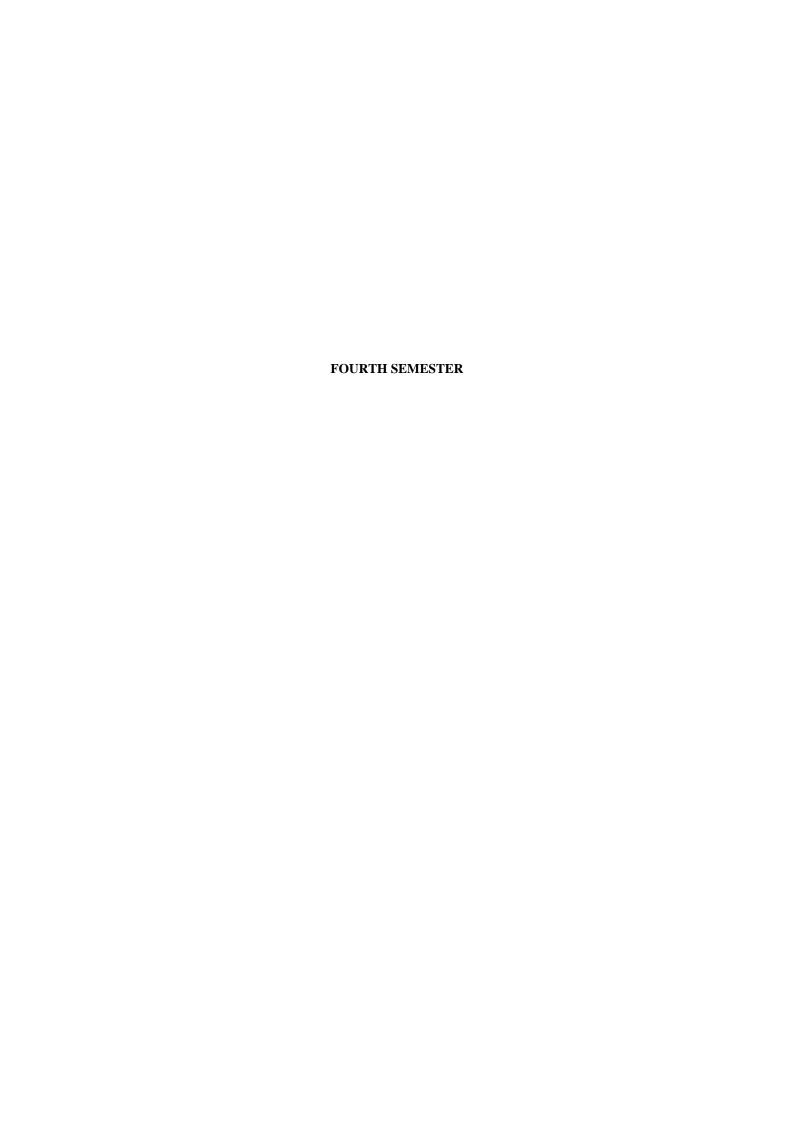
Unit III

Electronic Data Interchange: Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Need of Electronic Payment System: Study and examine the use of Electronic Payment system and the protocols used, Study Electronic Fund Transfer and secure electronic transaction protocol for credit card payment. Digital economy: Identify the methods of payments on the net – Electronic Cash, cheques and credit cards on the Internet.

Unit IV

Issues in E Commerce Understanding Ethical, Social and Political issues in E-Commerce: A model for Organizing the issues, Basic Ethical Concepts, Analysing Ethical Dilemmas, Candidate Ethical principles Privacy and Information Rights: Information collected at E-Commerce Websites, The Concept of Privacy, Legal protections Intellectual Property Rights: Types of Intellectual Property protection, Governance.

Text Books:

1. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.

2. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley.

3. Efraim Turban, Jae Lee, David King, H.Michael Chung, "Electronic Commerce–A ManagerialPerspective", Addison-Wesley.

4. Elias M Award, "Electronic Commerce from Vision to Fulfilment", 3rd Edition, PHI, Judy Strauss, Adel El-Ansary, Raymond Frost, "E-Marketing", 3RDEdition, Pearson Education.

FOURTH SEMESTER

BDS/4/CC16: Web Development							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	To illustrate the basic concepts and building blocks of web pages and web sites. Learn how to design and develop simple webpages.
Course Outcomes	On completion of this course, the students will be able to understand
CO	Learn the WWW and basic HTML tags
CO	Learn to link web pages, placing images in web pages and frame
CO	Understand the way to create CSS and format it
CO	Learn the basic concepts of java script used in web development.

Unit I

Introduction to HTML: A brief history of HTML and the World Wide Web, creating a simple web page, types of tags in HTML, HTML tag, head tag, body tag, paragraph and line break, headings, text formatting tags, special characters, lists, tables, alignment and spanning within the table.

Unit II

Links, Images, Forms and Frames in HTML: Linking within a web page, linking between your own web content, linking to external web content, linking to e-mail address, placing images on web page, turning images into links, working with forms, frames.

Unit III

CSS-Cascading Style Sheets: Working of CSS, basic style sheet, layout properties, formatting properties, using style classes and style id, Internal style sheet and inline styles, CSS properties, set colours, styling tables and hyperlinks.

Unit IV

Introduction to Javascript: Syntax rules, statements, functions, variables, objects, conditions, loops, event handlers, comments, expressions and operators, data types, working with strings, numeric array.

Text Books:
1. Julie C. Meloni: Sams TeachYourself HTML, CSS and JavaScript, Pearson Education.
2. Thomas A Powell: HTML & CSS-The Complete Reference, Tata McGraw Hill.

Reference Books:
1. Thomas A Powell: HTML-The Complete Reference, Tata McGraw Hill.

BDS/4/CC17: Data Mining and Warehousing							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	The objective of this course is to get the students familiar with different concepts of data warehouse and data mining, association rule mining, classification and prediction.
Course Outcomes	At the end of this course, the student will be able to :
CO1	define: the concepts of data mining, data pre-processing, outliers, data warehouse , association rule mining, data classification prediction and cluster Analysis.
CO2	describe: key process of data mining ,data warehousing, OLAP, data warehousing to data mining , association rule, classification and prediction methods.
CO3	apply: association rules. use: decision induction, Bayesian and back prorogation classification methods.
CO4	differentiate: operational database systems and data warehousing, single dimensional and multidimensional association rules, and data mining classification methods.

Unit I
Data Mining: Introduction, Motivation, Importance, Knowledge discovery process, data mining, kind of data, functionalities, interesting patterns, classification of data mining system, applications and trends in Data Mining, major issues in Data Mining

Unit II
Data Pre-processing: Introduction and need of pre-processing, data cleaning, data integration and transformation, data reduction, discretization and concept hierarchy generation.

Unit III
Data warehouse and OLAP Technology for Data Mining: data warehouse, difference between operational database systems and data warehouse, A Multidimensional Data Model, Data warehouse Architecture, Data warehouse Implementation, data warehousing to data mining, Data warehouse usage.

Unit IV
Classification: Basic concept of classification, classification by decision tree induction, Bayesian classification, rule-based classification, classification by back propagation, and other classification methods.

Text Books
1. Ale Berson, Stephen Smith, KorthTheorling, "Data Mining", Tata McGraw Hill.
2. Pieter Adriaans and Dolf Zantinge, "Data Mining", Addison-Wesley Longman.
3. Sam Anahory, "Data Warehousing in the Real World", Addison-Wesley Longman.

Reference Books
1. Chanchal Singh, "Data Mining and Warehousing", Wiley.

BDS/4/CC18: Programming in Python								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods	
				External	Internal			
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance	
					15	5	5	

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	The objective of this course is to get the students hands on practice with scripting/programming concepts of Python language
Course Outcomes	At the end of this course, the student will be able to :
CO1	define: installations, working, structures, control statements, operators, lists ,object oriented programming concepts, python libraries.
CO2	explain: conditional & control statements ,strings, OOPs ,file handling concepts ,libraries and packages of python programming.
CO3	categorize:datatypes,dictionaries,conditional&controlstatements,functions,python libraries.
CO4	design: basic and advanced applications in python.

Unit I
Introduction: Introduction to Cyber Security, Importance and challenges in Cyber Security, Cyberspace, Cyber threats, Cyber warfare, CIA Triad, Cyber Terrorism, Cyber Security of Critical Infrastructure, Cyber security, Organizational Implications.

Unit II
Cyber Attacks: Types of Hackers, Hackers and Crackers, Cyber-Attacks and Vulnerabilities, Malware threats, Sniffing, Gaining Access, Escalating Privileges, Executing Applications, Hiding Files, Covering Tracks, Worms, Trojans, Viruses, Backdoors

Unit III
Ethical Hacking: Concepts and Scopes, Threats and Attack Vectors, Information Assurance, Threat Modelling, Enterprise Information Security Architecture, Vulnerability Assessment and Penetration, testing, types of Social Engineering, Insider Attack, Preventing Insider Threats, Social Engineering Targets and Defence Strategies.

Unit IV
Introduction to Cyber Forensics: Computer Equipment and associated storage media, Role of forensics Investigator, Forensics Investigation Process, Collecting Network based Evidence, Writing Computer Forensics Reports, Auditing, Plan an audit against a set of audit criteria, Information Security Management System Management. Introduction to ISO 27001:2013.

Text Books
1. Donaldson S., Siegel S., Williams, C.K., Aslam A., "Enterprise Cyber security -How to Build a Successful Cyber Defense Program against Advanced Threats", 1e, Apress, 2015.
2. Nina Godbole, Sumit Belapure, "Cyber Security", Willey, 2011.
Reference Books
1. Roger Grimes, "Hacking the Hacker", 1e, Wiley, 2017.
2. Cyber Law by Bare Act, Govt of India, IT Act 2000.

BDS/4/CC19: SW Lab based on CC16							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BDS/4/CC20: SW Lab based on CC18							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BDS/4/AEC4 Communication Skills							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Ability Enhancement Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15	5	5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	Apply appropriate communication skills across settings, purposes, and audiences. Demonstrate knowledge of communication theory and application. Practice critical thinking to develop innovative and well-founded perspectives related to the students' emphases. Build and maintain healthy and effective relationships. Use technology to communicate effectively in various settings and contexts
Course Outcomes	At the end of this course, the student will be able to :
CO1	demonstrate critical and innovative thinking
CO2	display competence in oral, written, and visual communication
CO3	apply communication theories
CO4	show an understanding of opportunities in the field of communication. use current technology related to the communication field

Unit 1

Language and Communication: Definition of Communication; Function and purpose of Communication; Process of Communication; Barriers of Effective Communication; Types of communication, Verbal communication, on-verbal communication; The Impact of Communication on Performance

Unit 2

Remedial English: Parts of Speech; Sentences; Subject-Verb Agreement; Active Voice and Passive Voice; Degrees of Comparison; Direct and Indirect Speech; Question Tags

Oral Communications: Advantages and disadvantages of oral communication; Improving oral communication; One-to-One oral communication; Oral Presentations

Unit 3

Listening Skills: What is listening; Types of Listening; Barriers of Effective Listening; Strategies for Effective Listening; Semantic Markers; Listening to complaints.

Unit 4

Writing Skills: Note taking,Paraphrasing, elements of writing, business letter writing, other business communications.

Text Books:
1. B.K. Das and A. David, A Remedial Course in English, Book 2, C.I.E.F.L. (O.U.P.) 1980. 2. A.S. Hornby, Oxford Advanced Learner's Dictionary of Current English (O.U.P.) 3. A Textbook of English Phonetics for Indian Students by T. Balasubramanian

BDS/4/SEC3: Cyber Security							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	02	02	Lecture	35	15	3 Hours	TEE/MTE/ Assignment/ Attendance
					10	2.5	2.5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives	To study fundamental concepts in Network Security, security attack, cryptography, authentication, web security, system and email security.
Course Outcomes	At the end of this course, the student will be able to :
CO1	define: computer security, security standards, cipher model, encryption techniques, data encryption standards, public-key cryptography, security at transport layer, wireless security
CO2	explain: computer concepts related with the security, symmetric techniques, advanced encryption standard, concept of digital signature, security protocols, wireless security measures and email security.
CO3	illustrate: the different features related with computer security, encryption and symmetric techniques, data encryption standards, security at transport layer and wireless LAN security.
CO4	classify: the information about security, its architecture, types of attacks, security mechanism, encryption standards, protocols at transport layer and wireless LAN security.

Unit I
Introduction: Introduction to Cyber Security, Importance and challenges in Cyber Security, Cyberspace, Cyber threats, Cyber warfare, CIA Triad, Cyber Terrorism, Cyber Security of Critical Infrastructure, Cyber security, Organizational Implications.

Unit II
Cyber Attacks: Types of Hackers, Hackers and Crackers, Cyber-Attacks and Vulnerabilities, Malware threats, Sniffing, Gaining Access, Escalating Privileges, Executing Applications, Hiding Files, Covering Tracks, Worms, Trojans, Viruses, Backdoors

Unit III
Ethical Hacking: Concepts and Scopes, Threats and Attack Vectors, Information Assurance, Threat Modelling, Enterprise Information Security Architecture, Vulnerability Assessment and Penetration, testing, types of Social Engineering, Insider Attack, Preventing Insider Threats, Social Engineering Targets and Defence Strategies.

Unit IV
Introduction to Cyber Forensics: Computer Equipment and associated storage media, Role of forensics Investigator, Forensics Investigation Process, Collecting Network based Evidence, Writing Computer Forensics Reports, Auditing, Plan an audit against a set of audit criteria, Information Security Management System Management. Introduction to ISO 27001:2013.

Text Books

1. Donaldson S., Siegel S., Williams, C.K., Aslam A., "Enterprise Cyber security -How to Build a Successful Cyber Defense Program against Advanced Threats", 1e, Apress, 2015.
2. Nina Godbole, Sumit Belapure, "Cyber Security", Willey, 2011.

Reference Books

1. Roger Grimes, "Hacking the Hacker", 1e, Wiley, 2017.
2. Cyber Law by Bare Act, Govt of India, IT Act 2000.

CSE/GEC1: Fundamentals of Information Technology							
Course Type	Course Credit	Contact Hours/Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Generic Elective Theory	04	04	Lecture	70	30	3 Hours	TEE/MTE/ Assignment/ Attendance

Instructions to paper setter for Term-End Examination: The term-end examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives:	This course is aimed at enabling the students appreciate the working of various parts of a digital computers and peripheral devices interfaced with it apart from computer memory devices and computer programming languages' types/levels.

Course Outcomes	At the end of this course, the students will be able to:
CO1	enumerate various types of computers and its components including memory devices, input devices, output devices; software types; programming languages as also define various terms related to information technology discipline.
CO2	describe the working principles of various types of computers and its components including memory devices, input devices, output devices; software types; programming languages and related terms and concepts.
CO3	apply the information and knowledge gained in daily life for academic, research, entertainment, professional and related fields.
CO4	classify and categorize the data, computers, memory devices, input devices, output devices, computer software and computer languages based on various criteria.
CO5	evaluate and justify their requirement in respect of a computer and related hardware/software and make a leaned decision for procuring a computer.

Course Content CSE/GEC1: Fundamentals of Information Technology	
Unit - I	Historical evolution of computers, characteristics of computers, capabilities and limitations of computers. Type of computers based on different criteria like processing power, hardware generations, functions, and data processed Description of the terms: hardware, software and firmware. Applications of computers in different fields of public life, Block diagram of computer, its components and their functions.
Unit - II	Number systems - Binary, octal, decimal and Hexa-decimal, Conversion from one number systems to others, binary arithmetic, Boolean algebra/operations, logic gates and digital logic circuits.
Unit - III	Primary memory, RAM and its types, ROM and its types Cache memory, its function and levels Secondary memory: magnetic storage, optical storage, electronic storage. Input devices used with computer systems Output devices used with computer systems.
Unit - IV	Software its types and functions Application software and its examples System software and its examples. Computer languages and its types. Operating System, its objectives, functions and modules.

Text/Reference Books	
Text Books	1. PritiSinha, Pradeep K., Sinha, "Computer Fundamentals: Concepts, Systems & Applications", BPB Publications. 2. V. Rajaraman, "Fundamentals of Computers", PHI. 3. V. Rajaraman, "Introduction to Information Technology", PHI 4. R.K. Taxali "Introduction to Software Packages", Galgotia Publications.
Reference Books	1. Sanders D.H., "Computers Today", McGraw Hill Publications. 2. Ron White, "How Computers Work?", BPB Publications.

CSE/GEC2: Windows and Office Automation Tools

Course Type	Course Component	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
					External	Internal		
Generic Elective	Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
						15 | 5 | 5		
	Practical	01	02	Lab	25	-	3 Hours	Practical File/TEE

Instructions to paper setter for Term-End Examination: The term-end examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: Objective of this course is to make the students familiar with the functioning of the Internet, email, web-browsers, and e-commerce; surfing the Internet and downloading contents therefrom; legal and payment issues in e-commerce.

Course Outcomes	At the end of this course, the student will be able to:
CO1	define: installation, basic elements of windows, features of Word processing, Excel, PowerPoint.
CO2	describe: My computer, control panel, accessories in Windows, MS Word features, toolbars, various styles and tools, excel worksheet, data entry, editing, creating graphs, mathematical and statistical functions and formulas.
CO-3	perform: Windows installation, various tools, tables, charts, template in MS Word, Excel & PowerPoint.
CO4	classify: various tabs in MS Word, Excel, PowerPoint, mathematical and statistical functions and formulas in Excel, format and different operations on tables, PowerPoint elements: templates, wizards, views.
CO5	select: various menu options, tools, dialog boxes, slides and slide shows, Windows accessories, control panel, various layouts, various styles.
CO6	design: effective PowerPoint presentations, document creation & report writing in MS Word, statistical data sheets using Excel.

Course Content
CSE/GEC2   Windows and Office Automation Tools
Unit - I	WINDOWS: Installing WINDOWS starting and quitting WINDOWS Basic Elements of WINDOWS , My Computer, Network Neighbourhood, Sharing Devices, Windows Explorer (Files and Folder Operations), Control Panel, Accessories like Accessibility, Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc.
Unit - II	MS-WORD: Basic features of Word Processing, File-New, Open, Save, Print, Close, Page Setup, Edit-Find, Replace, Cut, Copy, Paste etc. View-various layouts, Zooming, Header, Footer, Toolbars, Insert-Various types of objects, Files, Symbols, Date, Time etc, Format-Various Styles, Auto format, Paragraph formatting, Bullets and numbering etc. Tools- Spell Checking, Word Count, Auto Correct, Languages etc, Tables- Insert, Delete, Update, Auto format and different operations on tables, Windows and Help.
Unit - III	EXCEL : Excel worksheet, data entry, editing, cell addressing, ranges, commands, menus, copying & moving cell content, inserting & deleting rows and column, column formats, cell protection, printing, creating, displaying & printing graphs. Mathematical and Statistical Functions and Formulas.

Unit - IV	MS PowerPoint: Introduction, PowerPoint elements -templates, wizards, views, colour schemes. PowerPoint menus options, sub-options, preparing presentation using different tools, working with drawing, templates, dialog boxes, building slides and slide shows.

Text/Reference Books	
Text Books	1. "Computer Concepts Windows and MS Office", Vikas Publishing House ISBN : 8125912398 2. "MS Office in NutShell" Vikas Publishing House ISBN : 8125914463 3. Rathbone Andy, "Windows XP for Dummies", IDG Books India (Published : 9/2001), ISBN : 8126502282.
Reference Books	1. Tyler, Denise, "Windows XP Home And Professional Editions" BPB Publications (Published : 9/2001).

CSE/GEC3: Introduction to Cyber Space								
Course Type	Course Component	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
					External	Internal		
Generic Elective	Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
						15 | 5 | 5		
	Practical	01	02	Lab	25	-	3 Hours	Practical File/TEE

Instructions to paper setter for Term-End Examination: The term-end examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: Objective of this course is to make the students familiar with the functioning of the Internet, email, web-browsers, and e-commerce; surfing the Internet and downloading contents therefrom; legal

and payment issues in e-commerce.

Course Outcomes	At the end of this course, the student will be able to:
CO1	define: Internet and its applications, ISP, HTML, Email, Web Browsers, Social Media and E-commerce.
CO2	explain: internet, intranet, internet service provider, HTML, structure and working of email, configuration of mail client like Outlook Express with mail server, functionality of web browsers, social media and concept of E-commerce.
CO-3	illustrate: internet and its applications, evolution of internet, structure of HTML, various tags with their uses in HTML, structure and working of email, concept and use of different type of web browser, searching and downloading from websites, use of social media and introduction to E-commerce
CO4	categorize: applications of internet, ISP, HTML elements, email messaging, function of web browsers, searching software's, various social media networks, their impact and issues and concept of e-commerce with payment issues.
CO5	compare: internet and intranet, different internet service providers on the basis of their service, email advantages and disadvantages, working of various web browsers and social media types.
CO6	design: various types of HTML application with the help of different elements along with their attributes and development of webpages.

Course Content
CSE/GEC3: Introduction to Cyber Space

Unit - I	Basics of internet and Intranet, Applications of Internet, Evolution of Internet, Internet Service Provider (ISP). Introduction to HTML, Structure of HTML, Web Page, Head and Body Sections, General structure of HTML tags-starting and ending a tag, various text formatting tags in HTML, Adding images, audio and video objects, Hyper linking.
Unit - II	Email: Basic Introduction, Advantages and Disadvantage, Structure of an E-Mail Message, Working of E-Mail (sending & receiving messages), Managing Email (creating new folders, deleting messages, forwarding messages, filtering messages), Configuration of Outlook Express.
Unit - III	Introduction to the Functionality of Web Browsers: Internet Explorer, Netscape Navigator Concept of WWW, surfing through web sites. Web Browsing (opening, viewing, saving a web page and book mark). Searching and downloading of different sites and software.
Unit - IV	Introduction to Social Media: Twitter, Facebook, YouTube, Whatsapp, LinkedIn, their advantages/disadvantages and issues. Introduction to E-commerce, its history, advantages, challenges, payment issues, legal issues.

Text/Reference Books

Text Books	4. RitendraGoel, "e-commerce", New Age International Publisher, 2008 5. Dougals E. Comer, "Computer Network and Internet", Pearson, 2008 6. Thomas A. Powell, "HTML - The Complete Reference", Tata McGraw-Hill, ISBN: 0074633325 7. Khurana R., "HTML", APH Publishing
Reference Books	1. Oliver Heathcote, "Internet Right From The Start" BPB Publications

CSE/GEC4: Information Technology for Lifelong Learning

CoursType	Course Component	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
					External	Internal		
Generic Elective	Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
						15 5 5		
	Practical	01	02	Lab	25	-	3 Hours	Practical File/TEE

Instructions for Mid-Term examination: The mid-term examination shall cover the first two units of the course content. The question paper will be set by the internal teacher.

Instructions to paper setter for Term-End Examination: The term-end examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: This course is aimed at empowering students in the internet and related fields,e-Learning and online content writing, moodles, ethical and legal issues in computing profession and preparing technical presentations and plagiarism detection.

Course Outcomes	At the end of this course, the student will be able to:
CO1	list: social media platforms, online learning tools; define: internet, blogs, social media, e-learning, e-content, cyber security, IPR.
CO2	give examples of online searching, online learning, social media, cyber crimes. explain: cyber safety ,cyber privacy, cyber security, IPR.
CO3	use: different social media to post his/her data, internet to post blogs, MOOCs.
CO4	categorize: different online learning tools, e-contents, social media.
CO5	compare social media platform, report writing tools and presentation tools and choose the best suitable one.
CO6	design and develop the new e-content , report and presentation design.

Course Content
CSE/GEC4: Information Technology for Lifelong Learning

Unit - I	Introduction to the Internet & WWW, searching the online content efficiently& safely; social media sites and safety, privacy and other issues in social media access, writing Internet blogs.

Unit - II	Introduction to online learning, e-Learning, and web-based learning; writing content for web-based/online readers; e-content development and delivery; concept of moodle; concepts of MOOCs.
Unit - III	Cyber-crime. cyber-security and Indian cyber-law; intellectual property rights.
Unit - IV	Preparing basic presentations; using basic and advanced presentation designs; Report writing (basic and advanced),
Text/Reference Books	
Text Books	1. Karen Markey, Online Searching: A Guide to Finding Quality Information Efficiently and Effectively, Rowman& Littlefield, 2019. 2. Ruth Soukup, How To Blog For Profit: Without Selling Your Soul, Life Well Lived Publications. 3. Diane Alkins and Desiree Pinder, E-Learning Fundamentals: A Practical Guide, ATD Press, 2015. 4. Barry G Blundell, Ethics in Computing, Science, and Engineering: A Student's Guide to Doing Things Right, Springer International Publishing, 2020. 5. ShwetaJaswal Vikram Singh Jaswal, Cyber Crime and Information Technology Act 2000, Regal Publications, 2014. 6. Lewis Fowler, Powerpoint Presentation Design: How to Create an Effective PowerPoint Presentation that Informs, Educates and Inspires Your Audience, Narratus Publishing, 2012. 7. Netzley, Guide to Report Writing, Pearson Education India, 2010. 8. Richard Posner, The Little Book of Plagiarism, Pantheon, 2007.
Reference Books	1. Herrington, A Guide to Authentic e-Learning - Connecting with E-learning, Routledge Publishing, 2010. 2. Kevin Bowyer, Ethics and computing, Wiley-IEEE Press; 2000. 3. John Bowden, Writing A Report, 9th Edition: How to Prepare, Write & Present Really Effective Reports, Robinson, 2011.