SEMESTER I

Course Code:**22POP13** | Course Name: **Principles of Programming using C**

Course Teacher: **Mr. Shrikanth N G, Mr. Pradeep V , Mr. Prashanth Kumar, Ms. Lolakshi P K**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
22POP13.1	**Elucidate** the basic architecture and functionalities of a computer and also recognize the hardware parts.	Understand (L2)	2
22POP13.2	**Apply** programming constructs of C language to solve the real-world problem	Apply (L3)	2
22POP13.3	**Explore** user-defined data structures like arrays in implementing solutions to problems like searching and sorting	Apply (L3)	2
22POP13.4	**Explore** user-defined data structures like structures, unions and pointers in implementing solutions	Apply (L3)	2
22POP13.5	**Design and Develop** Solutions to problems using modular programming constructs using functions.	Apply (L3)	2

SEMESTER II

Course Code:**BPLCK205B** | Course Name: **Introduction to Python Programming**

Course Teacher: **: Mr. Rizawan N Shaikh, Mrs. Anupama K, Dr. K. Baranitharan, Dr. Chandra Naik**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
BPLCK205B.1	**Apply** the Basics, flow control and Functions of python using simple program.	Apply (L3)	2
BPLCK205B.2	**Develop** Data Structures such as Lists, Tuples & Data Dictionary using Python.	Apply (L3)	2
BPLCK205B.3	**Construct** the programs in manipulating strings & Read/Write files from OS module in Python.	Apply (L3)	2
BPLCK205B.4	**Build Programs** based on the concepts of organizing & Debug files.	Apply (L3)	2
BPLCK205B.5	**Experiment** with the concepts of object oriented programming – Classes, objects, functions & methods using Python	Understand (L2)	2

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Department of Computer Science & Engineering

SEMESTER III

Course Code: **21CS32** | Course Name: **DATA STRUCTURES AND APPLICATIONS**

Course Teacher:**Mrs.Deeksha M ,Mrs. Deepika Kamath,Mr.Prashanth Kumar**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS32.1	**Observe** introduction to Data Structure,classification,different operations of arrays,structures.**Demonstrate** the Dynamic Memory Allocation of arrays, Multidimensional arrays,polynomial,sparse matrices.	Apply (L3)	2
21CS32.2	**Develop** the application programs on different operations of stack and queues..	Apply(L3)	2
21CS32.3	**Explain** definations ,classifications,representation of different types of Linked List and **Employ** different operations on Singly linked list,Doubly Linked List,Circular linked list and header files.	Apply(L3)	2
21CS32.4	**Construct** the application programs on different operations of binary trees and Binary Search Tree by understanding their definations and properties..	Apply(L3)	2
21CS32.5	**Manipulate** the application of AVL tree ,Red-black tree,Splay tree,B-tree,Graphs and Hashing Techniques.	Apply (L3)	2

SEMESTER III

Course Code: **21CS33** | Course Name: **Analog and Digital Electronics**

Course Teacher: **Mrs. Babitha Poojary/Mr. Abhijith L Kotian**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS33.1	**Demonstrate** various analog circuits with their applications between analog and digital signal.	Apply (L3))	2
21CS33.2	**Construct** different types of combinational logic circuits by using a bridge mapping techniques.	Apply (L3)	2
21CS33.3	**Construct** combinational logic circuits with various gates.	Apply (L3)	2
21CS33.4	**Illustrate** combinational logic circuits using VHDL simulation and demonstrate the working of Sequential Circuit using VHDL concept.	Apply (L3	2
21CS33.5	**Construct** different data processing circuits using flip flops.	Apply (L3)	2

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SEMESTER III

Course Code:**21CS34** | Course Name: **Computer Organization and Architecture**

Course Teacher: **Mrs. Vidya and Mr. Nivin K S**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS34.1	**Explain** the basic structure of computers, performance of processor, memory organization and machine instructions.	Understand (L2)	2
21CS34.2	**Analyse** and **Choose** appropriate interrupt hardware for communication with I/O devices.	Analyse (L4)	2
21CS34.3	**Explain** different types of memory architecture and **illustrate** the concept of virtual memory.	Understand (L2)	2
21CS34.4	**Apply** the knowledge of arithmetic operations and analyze the basic processing unit.	Apply (L3)	2
21CS34.5	**Analyze** the functions of parallel processing and pipelining.	Analyse (L4)	2

SEMESTER III

Course Code: **21CSL35** | Course Name: **OBJECT ORIENTED PROGRAMMING WITH JAVA LABORATORY**

Course Teacher: **Mr. NIVIN K S**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CSL35.1	**Observe** Introduction to java fundamentals, data types, operators, class and objects in java and **Construct** the simple application	Understand (L2) Apply (L3)	2
21CSL35.2	**Demonstrate** the concept of inheritance, polymorphism, method overloading,abstraction,package through relevant program.	Apply (L3)	2
21CSL35.3	**Construct** the abstract classes, interface, multithreading, string operations, using applications in java	Apply (L3)	2
21CSL35.4	**Develop** the programs in Exception handling, file operation programs, java applet, awt, swings	Apply (L3)	2

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Department of Computer Science & Engineering
SEMESTER III

Course Code:**21CSL381** | Course Name: **MASTERING OFFICE**

Course Teacher:**Mr Prashanth Kumar,Mrs Deepika Kamath, and Mrs Anupama**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CSL381.1	**Apply** the basic knowledge of computersto prepare documents	Apply (L2,L3)	2
21CSL381.2	**Analyze** and **apply** the concepts of modifying and linking worksheets along with graphics and necessary charts	Analyse(L4)	2
21CSL381.3	**Apply** the presentation skills along with audio and video effects	Apply(L3)	2
21CSL381.4	**Analyze** the concepts of working of MS Access and **Apply** them in the related queries	Apply(L3)	2
21CSL381.5	**Analyze** and **Apply** the use of Microsoft Outlook	Apply (L3)	2

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SEMESTER IV

Course Code: **21CS42** | Course Name: **Design and Analysis of Algorithms**

Course Teacher: **Mrs. Deeksha M, Mrs Deepika Kamath**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS42.1	**Analyze** the performance of the algorithms, state the efficiency using asymptotic notations and analyze mathematically the complexity of the algorithm.	L4	2
21CS42.2	**Apply** divide and conquer approaches and decrease and conquer approaches in solving the problems analyze the same	L3	2
21CS42.3	**Apply** the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the given problem.	L3	2
21CS42.4	**Apply** and analyze dynamic programming approaches to solve some problems. and improve an algorithm time efficiency by sacrificing space.	L3	2
21CS42.5	**Apply** and analyze backtracking, branch and bound methods and to describe P, NP and NP-Complete problems.	L3	2

SEMESTER - IV

Course Code: **21CS43** | Course Name: **MICROCONTROLLER AND EMBEDDED SYSTEMS**

Course Teacher: Mr.Abhijith L Kotian /Mrs.Babitha Poojary

Course Outcomes: After studying this course, students will be able to,

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS43.1	**Construct** the architectural features of ARM microcontroller	Apply L3	2
21CS43.2	**Apply** ARM microcontroller instructions on some problems and **Apply** optimization features on c compilers using basic c data types, register allocation and function Calls	Apply L3	2
21CS43.3	**Develop** different ARM programming using Assembly language for some problems	Apply L3	2
21CS43.4	**Build** the basic hardware components with their selection and **Experiment with** interfacing external devices using ARM Microcontroller	Apply L3	2
21CS43.5	**Make use of** the need of various real time operating system concepts for embedded system applications.	Apply L3	2

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SEMESTER - IV

Course Code: **21CS44** | Course Name: **OPERATING SYSTEMS**

Course Teacher: **Mrs.Vidya and Mrs.Reena Lobo**

Course Outcomes: After studying this course, students will be able to,

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS44.1	**Relate** the fundamentals of OS, operating system structures,operating System services and process management concepts.	L2	2
21CS44.2	**Apply** suitable technique for process scheduling and synchronization and multi-threaded programming concepts in multithreaded models using scheduling algorithms.	L3	2
21CS44.3	**Apply** various concepts of deadlock detection, prevention and memory management strategies.	L3	2
21CS44.4	**Illustrate** the concept of virtual memory management and file systems and its implementations	L2	2
21CS44.5	**Extend** the concepts of secondary storage structures and Linux OS using case studies.	L2	2

SEMESTER IV

Course Code: **21BE45** | Course Name: **BIOLOGY FOR ENGINEERS**

Course Teacher: **Dr. Prashanth Donkar**

Course Outcomes: After studying this course, students will be able to:

CO	Course Outcomes	Blooms Level	Target Level
21BE45.1	**Elucidate** the basic biological concepts via relevant industrial applications and case studies..	L2	2
21BE45.2	**Evaluate** the principles of design and development, for exploring novel bioengineering projects	L2	2
21BE45.3	Evaluate the principles of design and development, for exploring novel bioengineering projects related cardiac and respiratory systems.	L2	2
21BE45.4	**Corroborate** the concepts of biomimetics for specific requirements	L2	2
21BE45.5	**Think** critically towards exploring innovative biobased solutions for socially relevant problems.	L2	2

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SEMESTER IV

Course Code: **21CSL46**	Course Name: **PYTHON PROGRAMMING LABORATORY**

Course Teacher: **Dr.G.SRINIVASAN, Mr.VASUDEV S SHAHAPUR, Mrs.ANUPAMA.K**

Course Outcomes: After studying this course, students will be able to:

CO	Course Outcomes	Blooms Level	Target Level
21CSL46.1	**Apply** various Python fundamentals like data types, operators and flow control etc.	L3(Apply)	2
21CSL46.2	**Make** use of core data structures like lists, dictionaries, tuples and sets in Python for solving real-world problems.	L3(Apply)	2
21CSL46.3	**Build** the Object-Oriented Programming concepts in Python.	L3(Apply)	2
21CSL46.4	**Examine** regular expressions using python programming.	L4(Analyze)	2
21CSL46.5	**Identify** the external modules for creating and writing data to excel files and inspect the file operations to navigate the file systems.	L3(Apply)	2

SEMESTER IV

Course Code: **21KBK47**	Course Name: **Balake Kannada (ಬಳಕೆ ಕನ್ನ ಡ)**

Course Teacher: **Rizawan N Shaikh (ರಿಜ್ವಾ ನ ಎನ್ ಶೇಖ)**

CourseOutcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21KBK47.1	**Understand** the necessity of learning of local language for comfortable life	L2	2
21KBK47.2	**Understand** the kannada speak, read and write Kannada language as per requirement.	L2	2
21KBK47.3	Communicate in Kannada language in their daily life with kannada speakers.	L1	2
21KBK47.4	Understand the Kannada language properly and speak in polite conservation.	L2	2

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SEMESTER IV

Course Code: **21KSK49** | Course Name: **SaamskruthikaKannada**

Course Teacher: Prof.VasudevShahapur, Mrs.Vidya&Mrs.BabithaPoojary

CourseOutcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21KSK49.1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.	L2	2
21KSK49.2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂ	L2	2
21KSK49.3	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.	L1	2
21KSK49.4	ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.	L2	2

SEMESTER IV

Course Code: **21CSL481** | Course Name: **WEB PROGRAMMING**

Course Teacher: **Mrs. Deepika Kamath,Mrs.Vidya**

CourseOutcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CSL481.1	**Observe** the fundamentals of web Programming: Internet, WWW, Web Browsers, and Web Servers, URLs, MIME,HTTP, Security, The Web Programmers Toolbox and **apply** the basic concepts of HTML to design webpages	L3	2
21CSL481.2	**Demonstrate** the concepts of HTML and XHTML to construct the web pages. **Implement** web oriented application using HTML and XHTML	L3	2
21CSL481.3	**Design** and develop web page using HTML and XHTML document and display the content of the document using CSS	L3	2
21CSL481.4	**Implement** web pages using concepts of JavaScript to **Construct** dynamic documents.	L3	2
21CSL481.5	**Implement** web pages using advance concepts of java scripts	L3	2

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SEMESTER IV	
Course Code: **21CIP47**	Course Name: **Constitution of India and Professional Ethics**
Course Teacher: **Mr. Ajith Kumar**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CIP47.1	**Understand** the meaning and importance of Constitution	L1	2
21CIP47.2	**State** executives, Electoral process, Amendments	L1	2
21CIP47.3	**Analyse** Panchayat Raj institutions as a medium of decentralization	L1	2
21CIP47.4	**Realize** special provisions given for women, children and weaker section of the society	L1	2
21CIP47.5	**Exhibit** engineering ethics and responsibilities of engineers.	L1	2

SEMESTER IV	
Course Code: **21UHV49**	Course Name: **Universal Human Values**
Course Teacher: **Dr. Amshuman**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21UHV49.1	**Understanding** value education and exploring self for the process of value education. Basic human aspirations and methods to fulfil the basic human aspirations.	L2	2
21UHV49.2	**Understanding** Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, Understanding Human being as the Co-existence of the Self and the Body,Distinguishing between the Needs of the Self and the Body, Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, Understanding Human being as the co-existence of the self and the body and distinguishing between the needs of the self and body.	L2	2

21UHV49.3	**Understanding** the harmony in family and society	L2	2
21UHV49.4	**Understanding** the harmony in nature and existence	L2	2
21UHV49.5	**Understanding** the basis for humanistic education, humanistic constitution and universal human order and competence in professional ethics.	L2	2

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	SEMESTER V
Course Code:**18CS52**	Course Name: **COMPUTER NETWORKS AND SECURITY**
Course Teacher: **Mr. VENKATESH and Mrs. DEEKSHA M**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS52.1	**Analyze** network application with detailed study of features of application layer and different network applications with its protocols.	Analyze (L4)	2
18CS52.2	**Examine** various transport services provided by different transport layer protocols.	Analyse (L4)	2
18CS52.3	**Interpret**the basic concept of network layer functions such as routers, IP addressing and**Evaluate** the path using Routing Algorithms.	Evaluate (L5)	2
18CS52.4	**Analyze**the variouscryptography and authentication algorithms used in network security.	Analyze (L4)	2
18CS52.5	**Outline**various Multimedia Network applicationsand Protocols for Real-Time Conversational Applications	Understand (L2)	2

SEMESTER V	
Course Code: **18CS53**	Course Name: **DATABASE MANAGEMENT SYSTEM**
Course Teacher: **Mrs. Reena Lobo**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS53.1	**Understand**schema and ER-models to represent simple database application scenarios.	Understand (L2)	2
18CS53.2	**Understand and apply** the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL	Understand (L2) Apply (L3	2
18CS53.3	**Implement** simple database systems or applications using embedded and dynamic SQL.	Apply (L3)	2
18CS53.4	**Create** database using normalization**.**	Understand	2
18CS53.5	**Understand** transaction processing, concurrency control and database recovery protocols.	Understand (L2)	2

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	SEMESTER V
Course Code: **18CS54**	Course Name: **Automata Theory and Computability**
Course Teacher: **Dr Arun Anoop M**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS54.1	**Discuss** mathematical foundation building concepts with problems, **use** those mathematical computer-based skills to add in the finite automata and different types in order to **demonstrate** its working.	Apply L3	2
18CS54.2	**Identify** regular expression from automata-based machines and add closure property concepts in order to **identify** regular languages or not.	Understand L2	1
18CS54.3	**Recognise** grammar structure, design it, derive it based on grammar structure and rules, add its rules to build machine like PDA and **demonstrate** it to check if it is acceptable by the machine or not.	Apply L3	2
18CS54.4	**Classify** about algorithms and decision procedures for CFL and **examine** if it is solvable or not. **Sketch** and **demonstrate** new machine named Turing machine based on languages, identify types and its usages.	Analyse L4	2
18CS54.5	**Classify** decidable and undecidable languages, **use** halting problem concepts for Turing machine, and **identify** complexity functions, different P & NP concepts with some applications.	Apply L3	2

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	SEMESTER V
Course Code: **18CS55**	Course Name: **Application Development using Python**
Course Teacher: **Dr. S.Mohideen Badhusha**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS55.1	**Develop** an Application Program using **flow control statement , functions and Exception handling**.	Apply L3	2
18CS55.2	**Apply** the data structures such as **List, Tuples, Strings and Dictionaries techniques** and **Develop** an application in Python	Understand L2	1
18CS55.3	**Determine** the **pattern matching techniques with RE** and **Develop** the complete **file system, file system organization and debugging.**	Apply L3	2
18CS55.4	**Apply** OOP's the concepts such as **classes and objects, class and methods, classes and functions and Inheritance** in Python.	Analyse L4	2
18CS55.5	**Develop simple projects** in the processes of **web scraping, working with Excel spread sheets, PDF, Word, CSV, JSON file formats** using the python modules	Apply L3	2

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SEMESTER V

Course Code:**18CS56** | Course Name: **UNIX PROGRAMMING (UP)**

Course Teacher: **Mrs. ANUPAMA K.**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS56.1	**Discuss** about **Introduction** to Unix OS**,** the use of various **UNIX Commands**, the different File Types, **Experiment** the internal and external commands, different **file manipulation commands** with examples.	Apply (L3)	2
18CS56.2	**Observe** thevarious **attributes**, **permissions**, the**connecting commands** and **redirection files**. **Develop** the shell program for a given problem.	Apply (L3)	2
18CS56.3	**Demonstrate** the **Unix File APIs**, the**process control functions** with examples	Apply (L3)	2
18CS56.4	**Examine IPC** methods and **shared memory** concepts with examples.	Apply (L3)	2
18CS56.5	**Discuss signals** and**Daemon Process** and **Illustrate** them in C/C++ applications.	Apply (L3)	2

SEMESTER V

Course Code:**18CSL57** | Course Name: **COMPUTER NETWORK LABORATORY**

Course Teacher: **Mr. VENKATESH AND Mrs. RIZAWAN N SHAIKH**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CLS57.1	**Implement, Analyze** and **Evaluate** various networking concepts like Point-to-point, Ping messages and Ethernet LAN using NS2/NS3.	Evaluate (L5)	2
18CLS57.2	**Implement, Analyze** and **Evaluate** performance of ESS, GSM and CDMA using NS2/NS3.	Evaluate (L5)	2
18CLS57.3	**Demonstrate** the working of different concepts of networking applications like error detection technique, cryptography, routing algorithm and congestion control algorithm.	Apply (L3)	2
18CLS57.4	**Implement** the different transport services using socket programming.	Apply (L3)	2

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CO PO MAPPING – Academic Year 2022-23

SEMESTER VI

Course Code:**18CS61** | Course Name:**SYSTEM SOFTWARE AND COMPILERS**

Course Teacher:**Mr. Venkatesh AndDr. Manjunath Kotary**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS61.1	**Make** Use of SIC assembler translation process to study the architectural features of SIC systems.	Apply (L3)	2
18CS61.2	**Utilizethe** Structure of the Compiler to buildtheLexical Analyzer.	Apply (L3)	2
18CS61.3	**Analyze** and Design different types of parsers and Apply the Parser process for a given source string and respective grammar	Apply (L3)	2
18CS61.4	**Apply** LEX and YACC programming languages to demonstrate programs.	Apply (L3)	2
18CS61.5	**Interpret** SDD, SDT, Code Generators and Code Optimizations	Understand (L2)	2

SEMESTER - VI

Course Code: **18CS62** | Course Name:**Computer Graphics and Visualization**

Course Teacher :**Dr.Arun Anoop M &Dr.Madhusudan S**

Course Outcomes: After studying this course, students will be able to,

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS62.1	**Apply** overview of computer graphics and different algorithms.	L3 Apply	2
18CS62.2	**Apply** fill area Primitives, 2D Geometric Transformations and 2D viewing.	L3 Apply	2
18CS62.3	**Apply** Clipping, 3D Geometric Transformations, Color and Illumination Models.	L3 Apply	2
18CS62.4	**Illustrate** 3D Viewing and Visible Surface Detection.	L3 Apply	2
18CS62.5	**Evaluate** Input & interaction, Curves and Computer Animation.	L3 Apply	2

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Signature with date

SEMESTER VI	
Course Code: **18CS63**	Course Name: **Web technology and its applications**
Course Teachers: **Dr.S. Mohideen Badhusha**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS63.1	**Apply** the basic and advanced concepts of HTML and CSS programming in client side.	Apply (L3)	2
18CS63.2	**Apply** the basic and advanced concepts of JavaScript programming in client side.	Apply (L3)	2
18CS63.3	**Build** the basic and advanced concepts of PHP programming in server side.	Apply (L3)	2
18CS63.4	**Construct** the different concepts of web technology such as managing state, cookies, serialization, session, AJAX, XML and JSON using PHP programs in server side.	Apply (L3)	2

SEMESTER VI	
Course Code: **18CS644**	Course Name: **Advanced JAVA and J2EE**
Course Teacher: **Mr. R.Senthilkumar / Dr.S.Madhusudhan**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS644.1	**Understand** the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs.	**Understand** (L1)	1
18CS644.2	**Implement** client-server applications and TCP/IP socket programs.	**Apply** (L3)	3
18CS644.3	**Demonstrate** database access and details for managing information using the JDBC API.	**Apply** (L3)	3
18CS644.4	**Discuss** how servlets fit into Java-based web application architecture	**Apply** (L3)	3
18CS644.5	**Implement** reusable software components using Java Beans.	**Apply** (L3)	3

SEMESTER– VI	
Course Code: **18CSL66**	Course Name: **SYSTEM SOFTWARE AND OPERATING SYSTEMS LABORATORY**
Course Teacher: **Mr. VENKATESH And Mrs. REENA LOBO**	
Course Outcomes: After studying this course, students will be able to,	

CO Numbers	Course Outcomes	Blooms Level
18CSL66.1	**Develop** various problems using LEX and YACC tool	L3 (Apply)
18CSL66.2	**Develop** parsing techniques using YACC/C language for the grammars and Parse the given input string.	L3 (Apply)
18CSL66.3	**Develop** the program in C/JAVA language to generate machine codes for the input statement.	L3 (Apply)
18CSL66.4	**Develop** C/C++/JAVA program to simulate various operating system algorithms.	L3 (Apply)

SEMESTER - 6	
Course Code: **18CSL67**	Course Name:**Computer Graphics Laboratory and Mini Project**
Course Teacher :**Dr.Arun Anoop M , Mr.Senthilkumar R,Dr.Madhusudan S**	
Course Outcomes: After studying this course, students will be able to,	

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CSL67.1	**Apply** the concepts of line drawing algorithm and creation of triangle and its rotation based on its origin and fixed point.	L3 Apply	2
18CSL67.2	**Apply** the concepts of color cube and spin using OpenGL transformation matrices and allow the user to move the camera with perspective viewing.	L3 Apply	2
18CSL67.3	**Apply** the concepts of line clipping algorithm and allow user to draw tea pot on a table, add properties of light sources along with solid object surfaces.	L3 Apply	2
18CSL67.4	**Apply** the concepts of 3D geometric transformations for tetrahedron and develop a menu driven program to animate a flag using Bezier curve algorithm.	L3 Apply	2
18CSL67.5	**Implement** the concepts of scan fill algorithm.	L3 Apply	2

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Department of Computer Science and Engineering

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SEMESTER-06	AY-2022-23
Course Code: 18CV651	Course Name: Remote Sense & GIS
Course Teacher:	Dr. H.G. Umeshchandra

Subject	**REMOTE SENSING AND GIS**	**18CV651**	
COURSE OUTCOMES:			
CO No.	**On completion of this course, students will be able to:**	**Cognitive Level**	**Target level**
18CV651.1	**Collect** data and delineate various elements from the satellite imagery using their spectral signature.	L2 Understand	2
18CV651.2	**Analyze** different features of ground information to create raster or vector data.	L2 Understand	2
18CV651.3	Perform digital classification and create different the matic maps for solving specific problems.	L3 Apply	2
18CV651.4	Make decision based on the GIS analysis on thematic maps.	L2 Understand	2

SEMESTERVII	
Course Code:**18CS71**	Course Name: Artificial Intelligence and Machine Learning
Course Teacher: **VASUDEV SHAHAPUR**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS71.1	**Apply** the fundamentals of the AI with various searching techniques and Implement them.	Apply (L3)	2
18CS71.2	**Construct** knowledge representation using rules and algorithms related to concept learning.	Apply (L3)	2
18CS71.3	**Make** use of the decision tree algorithm and Artificial Neural Network techniques to solve certain problems in Machine Learning.	Apply (L3)	2
18CS71.4	**Utilize** the concept of Bayesians Learning and implement the related algorithms.	Apply (L3)	2
18CS71.5	**Classify** the concept of instance based learning, reinforcement learning with related algorithms	Apply (L3)	2

SEMESTER VII	
Course Code:**18CS72**	Course Name: **Big Data Analytics (BDA)**
Course Teacher: **Mr. Rizawan N Shaikh**	

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS72.1	**Interpret** the basics of big data analytics parallel processing, designing data architecture, storing and analyzing the big data along with application and case studies	Understand (L2)	2
18CS72.2	**Apply** Hadoop tools for HDFS and MapReduce design	Apply (L3)	2
18CS72.3	**Utilize** big data basic architecture patterns for NoSQL, MongoDB and Cassandra	Apply (L3)	2
18CS72.4	**Make use of** MapReduce programming model to process the Big Data query languages	Apply (L3)	2
18CS72.5	**Apply** machine learning algorithms in big data analytics for text mining, web and social network analytics	Apply (L3)	2

SEMESTER VII

Course Code: **18CSP77** | Course Name: **Project phase-1**

Course Coordinator: **Mrs.Vidya**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CSP77.1	**Apply fundamentals of** various technologies used in the areas of computer science and engineering.	L3(Apply)	2
18CSP77.2	**Apply** the relationship between theory and practice and the essential links between them	L3(Apply))	2
18CSP77.3	**Identify** the problem by applying acquired knowledge	L3(Apply)	2
18CSP77.4	**Analyze** The Problem with existing system	L4(Analyze)	2
18CSP77.5	**Design and develop** solutions to solve real world problems by applying knowledge of engineering fundamentals, specialization and research based knowledge.	L6(Create)	2

SEMESTER VII

Course Code:**18CS734** | Course Name: **USER INTERFACE DESIGN**

Course Teacher: **Ms. Vaishnavi Kulkarni**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS734.1	**Explain** User Interface with its importance, Characteristics and Principles.	Understand (L2)	2
18CS734.2	**Discuss** the concepts of User Interface Design Process, Business Functions and Design Standards.	Understand (L2)	2
18CS734.3	**Apply** the concepts of System Menus, and navigation schemes in User Interface Design.	Apply (L3)	2
18CS734.4	**Illustrate** the User Interface Design using window concepts.	Apply (L3)	2
18CS734.5	**Use** the Screen-Based Controls in User Interface Design	Apply (L3)	2

SEMESTER VII

Course Code: **18CS744** | Course Name: **CRYPTOGRAPHY**

Course Teacher: : **Dr.Manjunath Kotari/Dr.G.Srinivasan**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS744.1	**Apply** fundamental knowledge of math in cryptographic algorithms.	Apply (L3)	2.1
18CS744.2	Make use of public key cryptosystem and key exchange protocols to achieve security.	Apply (L3)	2.1
18CS744.3	Build a Secure system using Elliptic curve cryptography and appropriate key management and distribution protocol.	Apply (L3)	2.1
18CS744.4	Utilize digital certificates, authentication protocols and provide email security.	Apply (L3)	2.1
18CS744.5	Construct a secure system using IP Security protocols, transport and tunnel mode protocols.	Apply (L3)	2.1

SEMESTER VII

Course Code:**18CS752** | Course Name: **PYTHON APPLICATION PROGRAMMING (OPEN ELECTIVE)**

Course Teacher: **Dr. MADHUSUDHAN S**

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CS752.1	**Observe** basics of python and **Demonstrate** conditional statements and functions in Python	L3	2
18CS752.2	**Develop** application programs using Iteration, strings and files in Python.	L3	2
18CS752.3	**Apply** data structures such as Lists, Dictionaries, Tuples and Regular expressions in Python to implement simple programs.	L3	2
18CS752.4	**Explain** the concepts and applications of classes and objects, classes and functions, classes and methods.	L3	2
18CS752.5	**Experiment** on network programs using web services, Data bases and SQL.	L3	2

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SEMESTER VIII			
Course Code: 18CS81	**Course Name: INTERNET OF THINGS TECHNOLOGY**		
Course Teacher: VASUDEV SHAHAPUR			
Course Outcomes: After studying this course, students will be able to,			
CO Numbers	**Course Outcomes**	**Blooms Level**	**Target Level**
18CS81.1	**Illustrate** the impact and challenges posed by IoT networks leading to new architectural models.	(L3) Apply	2
18CS81.2	**Generalize** and **Interpret** the deployment of smart objects and the technologies to connect them to network	(L3) Apply	2
18CS81.3	**Demonstrate** the role of IoT protocols for efficient network communication	(L3) Apply	2
18CS81.4	**Interpret** the need for Data Analytics and Security in IoT	(L3) Apply	2
18CS81.5	**Exemplify** different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.	(L3) Apply	2

SEMESTER VIII			
Course Code: 18CS822	Course Name: **Storage Area Networks**		
Course Teacher: Dr.G.SRINIVASAN			
Course Outcomes: After studying this course, students will be able to,			
CO Numbers	**Course Outcomes**	**Blooms Level**	**Target Level**
18CS822.1	**Identify**thedifferent types of storage system and Data Centre environment.	Apply (L3)	2
18CS822.2	**Apply** variousRAID technologies in SAN and **understand** Intelligent Storage System.	Apply (L3)	2
18CS822.3	**Illustrate** FC-SAN, NAS and virtualization in SAN and **choose** different protocols for storage networking.	Understand (L2)	2
18CS822.4	**Make use of**backup recovery, disaster recoveryand business continuity for storage and NAS.	Apply (L3)	2
18CS822.5	**Illustrate** the replication andsecurity in storage infrastructure and its management.	Understand (L2)	2

SEMESTER VIII	
Course Code: 18CSS84	Course Name: **Technical Seminar**
Course Teacher: Mrs. ANUPAMA K.	
Course Outcomes: After studying this course, students will be able to:	

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CSS84.1	Understand the various technologies in the areas of computer science and engineering.	L2(Understand)	2
18CSP83.2	Apply the knowledge they have gained to improve the presentation skill	L3(Apply)	2
18CSS84.3	Apply the knowledge they have gained to improve the communication skill	L3(Apply)	2

Course Code: 18CSI85	**Course Name: Internship**
Course Coordinator: Mr. VENKATESH	
Course Outcomes: After studying this course, students will be able to:	

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CSI85.1	**Design** and **develop** engineering skills through specific tasks carried out in a suitable real-world environment and business organization.	Apply (L3)	2
18CSI85.2	**Inspect** the impact of one's developing personal knowledge, practice and skills in society and **Adapt** to the Industry environment and ethical values.	Analyze (L4)	2
18CSI85.3	**Comprehend** the knowledge of engineering and management principles by writing reports and design documentation with presentations.	Analyze (L4)	2
18CSI85.4	**Model** the complex engineering problems and activities by applying appropriate techniques with help of modern IT tools	Analyze (L4)	2

H.O.D
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