Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution

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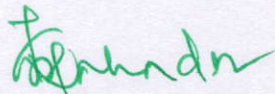
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1.PROGRAM OUTCOMES

Engineering graduates will be able to

PO1.Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

PO2.Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3.Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO4.Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5.Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6.The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7.Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8.Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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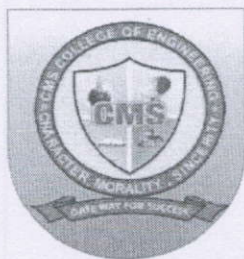
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PO9.Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10.Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12.Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

2.PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1. Exhibit design and programming skills to build and automate business solutions using cutting edge technologies.

PSO2. Strong theoretical foundation leading to excellence and excitement towards research, to provide elegant solutions to complex problems.

PSO3. Ability to work effectively with various engineering fields as a team to design, build and develop system applications.

3. COURSE OUTCOMES (COS) OF THE COMPUTER SCIENCE AND ENGINEERING

I YEAR

CS101	HS3152	PROFESSIONAL ENGLISH - I
CS101.1	To use appropriate words in a professional context	
CS101.2	To gain understanding of basic grammatic structures and use them in right context.	
CS101.3	To read and infer the denotative and connotative meanings of technical texts	
CS101.4	To write definitions, descriptions, narrations and essays on various topics	

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CS102	MA3151	MATRICES AND CALCULUS
CS102.1	Use the matrix algebra methods for solving practical problems.	
CS102.2	Apply differential calculus tools in solving various application problems.	
CS102.3	Able to use differential calculus ideas on several variable functions.	
CS102.4	Apply different methods of integration in solving practical problems.	
CS102.5	Apply multiple integral ideas in solving areas, volumes and other practical problems.	

| CS103	PH3151	ENGINEERING PHYSICS
CS103.1	Understand the importance of mechanics.	
CS103.2	Express their knowledge in electromagnetic waves.	
CS103.3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.	
CS103.4	Understand the importance of quantum physics.	
CS103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands.	

CS104	CY3151	ENGINEERING CHEMISTRY
CS104.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.	
CS104.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.	
CS104.3	To apply the knowledge of phase rule and composites for material selection requirements.	
CS104.4	To recommend suitable fuels for engineering processes and applications.	
CS104.5	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.	

CS105	GE3151	PROBLEM SOLVING AND PYTHON PROGRAMMING
CS105.1	Develop algorithmic solutions to simple computational problems.	

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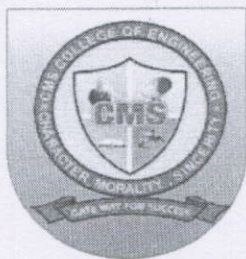
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CS105.2	Develop and execute simple Python programs.
CS105.3	Write simple Python programs using conditionals and loops for solving problems.
CS105.4	Decompose a Python program into functions.
CS105.5	Represent compound data using Python lists, tuples, dictionaries etc.
CS105.6	Read and write data from/to files in Python programs.

| CS106	GE3171	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY
CS106.1	Develop algorithmic solutions to simple computational problems	
CS106.2	Develop and execute simple Python programs.	
CS106.3	Implement programs in Python using conditionals and loops for solving problems.	
CS106.4	Deploy functions to decompose a Python program.	
CS106.5	Process compound data using Python data structures.	
CS106.6	Utilize Python packages in developing software applications.	

CS107	BS3171	PHYSICS AND CHEMISTRY LABORATORY
CS107.1	Understand the functioning of various physics laboratory equipment.	
CS107.2	Use graphical models to analyze laboratory data	
CS107.3	Use mathematical models as a medium for quantitative reasoning and describing physical reality.	
CS107.4	Access, process and analyze scientific information.	
CS107.5	Solve problems individually and collaboratively.	
CS107.6	To analyze the quality of water samples with respect to their acidity, alkalinity, hardness and DO.	
CS107.7	To determine the amount of metal ions through volumetric and spectroscopic techniques	
CS107.8	To analyze and determine the composition of alloys.	
CS107.9	To learn simple method of synthesis of nanoparticles	
CS107.10	To quantitatively analyze the impurities in solution by electro analytical techniques	

CS108	GE3172	ENGLISH LABORATORY
CS108.1	To listen to and comprehend general as well as complex academic information	
CS108.2	To listen to and understand different points of view in a discussion	

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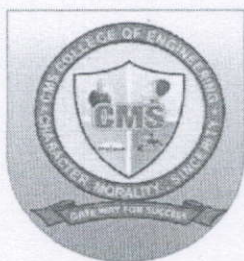
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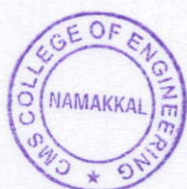
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CS108.3	To speak fluently and accurately in formal and informal communicative contexts
CS108.4	To describe products and processes and explain their uses and purposes clearly and accurately
CS108.5	To express their opinions effectively in both formal and informal discussions

CS109	HS3252	PROFESSIONAL ENGLISH - II
CS109.1	To compare and contrast products and ideas in technical texts.	
CS109.2	To identify and report cause and effects in events, industrial processes through technical texts	
CS109.3	To analyse problems in order to arrive at feasible solutions and communicate them in the written format.	
CS109.4	To present their ideas and opinions in a planned and logical manner	
CS109.5	To draft effective resumes in the context of job search.	

CS110	MA3251	STATISTICS AND NUMERICAL METHODS
CS110.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.	
CS110.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.	
CS110.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.	
CS110.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.	
CS110.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.	

CS111	PH3256	PHYSICS FOR INFORMATION SCIENCE
CS111.1	Gain knowledge on classical and quantum electron theories, and energy band structures	
CS111.2	Acquire knowledge on basics of semiconductor physics and its applications in various devices	
CS111.3	Get knowledge on magnetic properties of materials and their applications in data storage	

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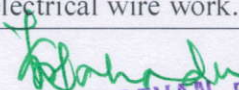| CS111.4	Have the necessary understanding on the functioning of optical materials for optoelectronics
CS111.5	Understand the basics of quantum structures and their applications and basics of quantum computing

CS112	BE3251	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
CS112.1	Compute the electric circuit parameters for simple problems	
CS112.2	Explain the working principle and applications of electrical machines	
CS112.3	Analyze the characteristics of analog electronic devices	
CS112.4	Explain the basic concepts of digital electronics	
CS112.5	Explain the operating principles of measuring instruments	

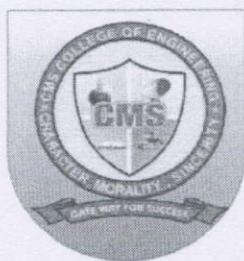| CS113	GE3251	ENGINEERING GRAPHICS
CS113.1	Use BIS conventions and specifications for engineering drawing.	
CS113.2	Construct the conic curves, involutes and cycloid.	
CS113.3	Solve practical problems involving projection of lines.	
CS113.4	Draw the orthographic, isometric and perspective projections of simple solids.	
CS113.5	Draw the development of simple solids.	

CS114	CS3251	PROGRAMMING IN C
CS114.1	Demonstrate knowledge on C Programming constructs	
CS114.2	Develop simple applications in C using basic constructs	
CS114.3	Design and implement applications using arrays and strings	
CS114.4	Develop and implement modular applications in C using functions.	
CS114.5	Develop applications in C using structures and pointers.	
CS114.6	Design applications using sequential and random access file processing.	

CS115	GE3271	ENGINEERING PRACTICES LABORATORY
CS115.1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.	
CS115.2	Wire various electrical joints in common household electrical wire work.	

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CS115.3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.
CS115.4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB

CS116	CS3271	PROGRAMMING IN C LABORATORY
CS116.1	Demonstrate knowledge on C programming constructs.	
CS116.2	Develop programs in C using basic constructs.	
CS116.3	Develop programs in C using arrays.	
CS116.4	Develop applications in C using strings, pointers, functions.	
CS116.5	Develop applications in C using structures.	
CS116.6	Develop applications in C using file processing.	

CS117	GE3272	COMMUNICATION LABORATORY
CS117.1	Speak effectively in group discussions held in a formal /semi formal contexts.	
CS117.2	Discuss, analyze and present concepts and problems from various perspectives to arrive at suitable solutions	
CS117.3	Write emails, letters and effective job applications.	
CS117.4	Write critical reports to convey data and information with clarity and precision	
CS117.5	Give appropriate instructions and recommendations for safe execution of tasks	

II YEAR

CS201	MA3354	DISCRETE MATHEMATICS
CS201.1	Have knowledge of the concepts needed to test the logic of a program.	
CS201.2	Have an understanding in identifying structures on many levels.	
CS201.3	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.	
CS201.4	Be aware of the counting principles	
CS201.5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.	

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CS202	CS3351	DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION
CS202.1	Design various combinational digital circuits using logic gates	
CS202.2	Design sequential circuits and analyze the design procedures	
CS202.3	State the fundamentals of computer systems and analyze the execution of an instruction	
CS202.4	Analyze different types of control design and identify hazards	
CS202.5	Identify the characteristics of various memory systems and I/O communication	

| CS203	CS3352	FOUNDATIONS OF DATA SCIENCE
CS203.1	Define the data science process	
CS203.2	Understand different types of data description for data science process	
CS203.3	Gain knowledge on relationships between data	
CS203.4	Use the Python Libraries for Data Wrangling	
CS203.5	Apply visualization Libraries in Python to interpret and explore data	

CS204	CS3301	DATA STRUCTURES
CS204.1	Define linear and non-linear data structures.	
CS204.2	Implement linear and non-linear data structure operations.	
CS204.3	Use appropriate linear/non-linear data structure operations for solving a given problem.	
CS204.4	Apply appropriate graph algorithms for graph applications.	
CS204.5	Analyze the various searching and sorting algorithms.	

CS205	CS3391	OBJECT ORIENTED PROGRAMMING
CS205.1	Apply the concepts of classes and objects to solve simple problems.	
CS205.2	Develop programs using inheritance, packages and interfaces.	
CS205.3	Make use of exception handling mechanisms and multithreaded model to solve real world problems.	
CS205.4	Build Java applications with I/O packages, string classes, Collections and generics concepts.	
CS205.5	Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications.	

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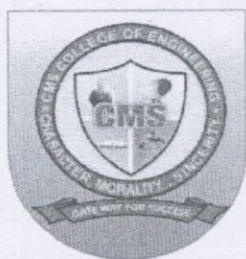
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CS206	CS3311	DATA STRUCTURES LABORATORY
CS206.1	Implement Linear data structure algorithms.	
CS206.2	Implement applications using Stacks and Linked lists.	
CS206.3	Implement Binary Search tree and AVL tree operations.	
CS206.4	Implement graph algorithms.	
CS206.5	Analyze the various searching and sorting algorithms.	

CS207	CS3381	OBJECT ORIENTED PROGRAMMING LABORATORY
CS207.1	Design and develop java programs using object oriented programming concepts.	
CS207.2	Develop simple applications using object oriented concepts such as package, exceptions.	
CS207.3	Implement multithreading, and generics concepts.	
CS207.4	Create GUIs and event driven programming applications for real world problems.	
CS207.5	Implement and deploy web applications using Java.	

CS208	CS3361	DATA SCIENCE LABORATORY
CS208.1	Make use of the python libraries for data science.	
CS208.2	Make use of the basic Statistical and Probability measures for data science.	
CS208.3	Perform descriptive analytics on the benchmark data sets.	
CS208.4	Perform correlation and regression analytics on standard data sets.	
CS208.5	Perform correlation and regression analytics on standard data sets	

CS209	CS3452	THEORY OF COMPUTATION
CS209.1	Construct automata theory using Finite Automata.	
CS209.2	Write regular expressions for any pattern.	
CS209.3	Design context free grammar and Pushdown Automata.	
CS209.4	Design Turing machine for computational functions.	
CS209.5	Differentiate between decidable and undecidable problems.	

CS210	CS3491	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
CS210.1	Use appropriate search algorithms for problem solving.	
CS210.2	Apply reasoning under uncertainty.	

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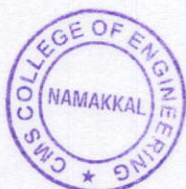
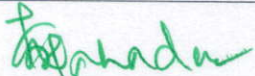| CS210.3	Build supervised learning models.
CS210.4	Build ensembling and unsupervised models.
CS210.5	Build deep learning neural network models.

CS211	CS3492	DATABASE MANAGEMENT SYSTEMS
CS211.1	Construct SQL Queries using relational algebra.	
CS211.2	Design database using ER model and normalize the database.	
CS211.3	Construct queries to handle transaction processing and maintain consistency of the database.	
CS211.4	Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database.	
CS211.5	Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement.	

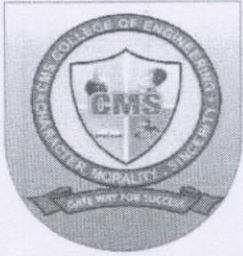| CS212	CS3401	ALGORITHMS
CS212.1	Analyze the efficiency of algorithms using various frameworks.	
CS212.2	Apply graph algorithms to solve problems and analyze their efficiency.	
CS212.3	Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems.	
CS212.4	Use the state space tree method for solving problems.	
CS212.5	Solve problems using approximation algorithms and randomized algorithms.	

CS213	CS3451	INTRODUCTION TO OPERATING SYSTEMS
CS213.1	Analyze various scheduling algorithms and process synchronization.	
CS213.2	Explain deadlock prevention and avoidance algorithms.	
CS213.3	Compare and contrast various memory management schemes.	
CS213.4	Explain the functionality of file systems, I/O systems, and Virtualization	
CS213.5	Compare iOS and Android Operating Systems.	

CS214	GE3451	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY
CS214.1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.	
CS214.2	To identify the causes, effects of environmental pollution and natural disasters and	

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	contribute to the preventive measures in the society.
CS214.3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
CS214.4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
CS214.5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.

CS215	CS3461	OPERATING SYSTEMS LABORATORY
CS215.1	Define and implement UNIX Commands.	
CS215.2	Compare the performance of various CPU Scheduling Algorithms.	
CS215.3	Compare and contrast various Memory Allocation Methods.	
CS215.4	Define File Organization and File Allocation Strategies.	
CS215.5	Implement various Disk Scheduling Algorithms.	

CS216	CS3481	DATABASE MANAGEMENT SYSTEMS LABORATORY
CS216.1	Create databases with different types of key constraints	
CS216.2	Construct simple and complex SQL queries using DML and DCL commands.	
CS216.3	Use advanced features such as stored procedures and triggers and incorporate in GUI based application development.	
CS216.4	Create an XML database and validate with meta-data (XML schema).	
CS216.5	Create and manipulate data using NOSQL database.	

III YEAR

CS301	CS3591	COMPUTER NETWORKS
CS301.1	Explain the basic layers and its functions in computer networks	
CS301.2	Understand the basics of how data flows from one node to another.	
CS301.3	Analyze routing algorithms.	
CS301.4	Describe protocols for various functions in the network	
CS301.5	Analyze the working of various application layer protocols	

CS302	CS3501	COMPILER DESIGN

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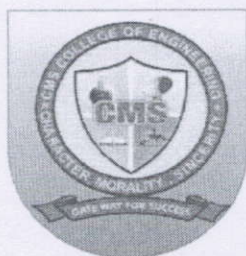
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CS302.1	Understand the techniques in different phases of a compiler.
CS302.2	Design a lexical analyser for a sample language and learn to use the LEX tool
CS302.3	Apply different parsing algorithms to develop a parser and learn to use YACC tool
CS302.4	Understand semantics rules (SDT), intermediate code generation and run-time environment.
CS302.5	Implement code generation and apply code optimization techniques

CS303	CB3491	CRYPTOGRAPHY AND CYBER SECURITY
CS303.1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities.	
CS303.2	Apply the different cryptographic operations of symmetric cryptographic algorithms	
CS303.3	Apply the different cryptographic operations of public key cryptography	
CS303.4	Apply the various Authentication schemes to simulate different applications.	
CS303.5	various cyber crimes and cyber security	

CS304	CS3551	DISTRIBUTED COMPUTING
CS304.1	Explain the foundations of distributed systems (K2)	
CS304.2	Solve synchronization and state consistency problems (K3)	
CS304.3	Use resource sharing techniques in distributed systems (K3)	
CS304.4	Apply working model of consensus and reliability of distributed systems (K3)	
CS304.5	Explain the fundamentals of cloud computing (K2)	

CS305	CCS334	BIG DATA ANALYTICS
CS305.1	Describe big data and use cases from selected business domains.	
CS305.2	Explain NoSQL big data management.	
CS305.3	Install, configure, and run Hadoop and HDFS.	
CS305.4	Perform map-reduce analytics using Hadoop.	
CS305.5	Use Hadoop-related tools such as HBase, Cassandra, Pig, and Hive for big data analytics	

CS306	CCS375	WEB TECHNOLOGIES
CS306.1	Construct a basic website using HTML and Cascading Style Sheets	
CS306.2	Build dynamic web page with validation using Java Script objects and by applying	

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		different event handling mechanisms
CS306.3		Develop server side programs using Servlets and JSP.
CS306.4		Construct simple web pages in PHP and to represent data in XML format.
CS306.5		Develop interactive web applications.

CS307	CCS356	OBJECT ORIENTED SOFTWARE ENGINEERING
CS307.1		Compare various Software Development Lifecycle Models.
CS307.2		Evaluate project management approaches as well as cost and schedule estimation strategies.
CS307.3		Perform formal analysis on specifications.
CS307.4		Use UML diagrams for analysis and design
CS307.5		Architect and design using architectural styles and design patterns, and test the system

CS308	CS3691	EMBEDDED SYSTEMS AND IOT
CS308.1		Explain the architecture of embedded processors.
CS308.2		Write embedded C programs.
CS308.3		Design simple embedded applications.
CS308.4		Compare the communication models in IOT
CS308.5		Design IoT applications using Arduino/Raspberry Pi /open platform.

CS309	CCS339	CRYPTOCURRENCY AND BLOCKCHAIN TECHNOLOGIES
CS309.1		Understand emerging abstract models for Blockchain Technology
CS309.2		Identify major research challenges and technical gaps existing between theory and practice in the crypto currency domain.
CS309.3		It provides conceptual understanding of the function of Blockchain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable.
CS309.4		Apply hyperledger Fabric and Ethereum platform to implement the Block chain Application

CS310	CCS341	DATA WAREHOUSING
CS310.1		Design data warehouse architecture for various Problems

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CS310.2	Apply the OLAP Technology
CS310.3	Analyse the partitioning strategy
CS310.4	Critically analyze the differentiation of various schema for given problem
CS310.5	Frame roles of process manager & system manager

CS311	CCS352	MULTIMEDIA AND ANIMATION
CS311.1	Get the bigger picture of the context of Multimedia and its applications	
CS311.2	Use the different types of media elements of different formats on content pages	
CS311.3	Author 2D and 3D creative and interactive presentations for different target multimedia applications.	
CS311.4	Use different standard animation techniques for 2D, 21/2 D, 3D applications	
CS311.5	Understand the complexity of multimedia applications in the context of cloud, security, big data streaming, social networking, CBIR etc.,	

CS312	OEE351	RENEWABLE ENERGY SYSTEM
CS312.1	Attained knowledge about various renewable energy technologies	
CS312.2	Ability to understand and design a PV system.	
CS312.3	Understand the concept of various wind energy system.	
CS312.4	Gained knowledge about various possible hybrid energy systems	
CS312.5	Attained knowledge about various application of renewable energy technologies	

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