SEM 1				
Theory				
	Sr.No.	**Subject Name**	**Subject code**	**Course outcome**
	1	**Database Management Systems**	**310241**	**CO1:** Analyze and design Database Management System using ER model
				CO2: Implement database queries using database languages
				CO3: Normalize the database design using normal forms
				CO4: Apply Transaction Management concepts in real-time situations
				CO5: Use NoSQL databases for processing unstructured data
				CO6: Differentiate between Complex Data Types and analyze the use of appropriate data types
	2	**Theory Of Computation**	**310242**	**CO1**: Understand formal language, translation logic, essentials of translation, alphabets, language representation and apply it to design Finite Automata and its variants
				CO2: Construct regular expression to present regular language and understand pumping lemma for RE
				CO3: Design Context Free Grammars and learn to simplify the grammar
				CO4: Construct Pushdown Automaton model for the Context Free Language
				CO5: Design Turing Machine for the different requirements outlined by theoretical computer science
				CO6: Understand different classes of problems, classify and analyze them and study concepts of NP completeness
	3	**System Programming and Operating System**	**310243**	**CO1:** Analyze and synthesize basic System Software and its functionality.
				CO2: Identify suitable data structures and Design & Implement various System Software
				CO3: Compare different loading schemes and analyze the performance of linker and loader
				CO4: Implement and Analyze the performance of process scheduling algorithms
				CO5: Identify the mechanism to deal with deadlock and concurrency issues
				CO6: Demonstrate memory organization and memory management policies

	4	**Computer Networks and Security**	**310244**	**CO1:** Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies
				CO2: Illustrate the working and functions of data link layer
				CO3: Analyze the working of different routing protocols and mechanisms
				CO4: Implement client-server applications using sockets
				CO5: Illustrate role of application layer with its protocols, client-server architectures
				CO6: Comprehend the basics of Network Security
	5	**Internet of Things and Embedded System**	**310245**	**CO1:** Understand the fundamentals and need of Embedded Systems for the Internet of Things
				CO2: Apply IoT enabling technologies for developing IoT systems
				CO3: Apply design methodology for designing and implementing IoT applications
				CO4: Analyze IoT protocols for making IoT devices communication
				CO5: Design cloud based IoT systems
				CO6: Design and Develop secured IoT applications
Practical				
	6	**Database Management System Laboratory**	**310246**	**CO1:** Design E-R Model for given requirements and convert the same into database tables
				CO2: Design schema in appropriate normal form considering actual requirements **CO4:** Implement PL/SQL Code block for given requirements
				CO3: Implement SQL queries for given requirements , using different SQL concepts
				CO4: Implement PL/SQL Code block for given requirements
				CO5: Implement NoSQL queries using MongoDB
				CO6: Design and develop application considering actual requirements and using database concepts
				CO1: Analyze the requirements of network types, topology and transmission media
				CO2: Demonstrate error control, flow control techniques and protocols and analyze them

	7	**Computer Network Security and Laboratory**	**310247**	**CO3:** Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms
				CO4: Develop Client-Server architectures and prototypes
				CO5: Implement web applications and services using application layer protocols
				CO6: Use network security services and mechanisms
	8	**Lab Practice I**	**310248**	**CO1:** Implement language translators
				CO2: Use tools like LEX and YACC
				CO3: Implement internals and functionalities of Operating System
				CO4: Design IoT and Embedded Systems based application
				CO5: Develop smart applications using IoT
				CO6: Develop IoT applications based on cloud environment
	9	**Seminar and Telecommunication**	**310249**	**CO1:** Analyze a latest topic of professional interest
				CO2: Enhance technical writing skills
				CO3: Identify an engineering problem, analyze it and propose a work plan to solve it
				CO4: Communicate with professional technical presentation skills
	10	**Audit Course 5**	**310250**	**CO1:** Summarize the principles of proper courtesy as they are practiced in the workplace
				CO2: Apply proper courtesy in different professional situations
				CO3: Practice and apply appropriate etiquettes in the working environment and day to day life
				CO4: Build proper practices personal and business communications of Ethics and Etiquettes

SEM 2

Theory

	Sr.No.	Subject Name	Subject code	Course outcome
	1	**Datascience and Bigdata Analytics**	**310251**	**CO1:** Analyze needs and challenges for Data Science Big Data Analytics
				CO2: Apply statistics for Big Data Analytics
				CO3: Apply the lifecycle of Big Data analytics to real world problems
				CO4: Implement Big Data Analytics using Python programming

				CO5: Implement data visualization using visualization tools in Python programming
				CO6: Design and implement Big Databases using the Hadoop ecosystem
	2	**Web Technology**	**310252**	**CO1:** Implement and analyze behavior of web pages using HTML and CSS
				CO2: Apply the client side technologies for web development
				CO3: Analyze the concepts of Servlet and JSP
				CO4: Analyze the Web services and frameworks
				CO5: Apply the server side technologies for web development
				CO6: Create the effective web applications for business functionalities using latest web development platforms
	3	**Artificial Intelligence**	**310253**	**CO1:** Identify and apply suitable Intelligent agents for various AI applications
				CO2: Build smart system using different informed search / uninformed search or heuristic approaches
				CO3: Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
				CO4: Apply the suitable algorithms to solve AI problems
				CO5: Implement ideas underlying modern logical inference systems
				CO6: Represent complex problems with expressive yet carefully constrained language of representation
	4	**Information Security**	**310254**	**CO1:** Design system using different informed search / uninformed search or heuristic approaches
				CO2: Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
				CO3: Design and develop an expert system
				CO4: Use tools and techniques in the area of Information Security
				CO5: Use the knowledge of security for problem solving
				CO6: Apply the concepts of Information Security to design and develop applications

	5	**Internship**	**310255**	**CO2:** To apply knowledge gained through internships to complete academic activities in a professional manner.
				CO3: To choose appropriate technology and tools to solve given problem.
				CO4: To demonstrate abilities of a responsible professional and use ethical practices in day to day life.
				CO5: Creating network and social circle, and developing relationships with industry people.
				CO6: To analyze various career opportunities and decide carrier goals.
Practical				
	6	**Datascience and Bigdata Analytics Laboratory**	**310256**	**CO1:** Apply principles of Data Science for the analysis of real time problems
				CO2: Implement data representation using statistical methods
				CO3: Implement and evaluate data analytics algorithms
				CO4: Perform text preprocessing
				CO5: Implement data visualization techniques
				CO6: Use cutting edge tools and technologies to analyze Big Data
	7	**Web Technology Laboratory**	**310257**	**CO1:** Understand the importance of website planning and website design issues
				CO2: Apply the client side and server side technologies for web application development
				CO3: Analyze the web technology languages, frameworks and services
				CO4: Create three tier web based applications
	8	**Lab Practice II**	**310258**	**CO1:** Implement language translators
				CO2: Use tools like LEX and YACC
				CO3: Implement internals and functionalities of Operating System
				CO4: Design IoT and Embedded Systems based application
				CO5: Develop smart applications using IoT
				CO6: Develop IoT applications based on cloud environment
	9	**Audit Course 6**	**310259**	**CO1:** Comprehend the importance of Sustainable Energy Systems
				CO2: Correlate the human population growth and its trend to the natural resource degradation and develop the awareness about his/her role towards Sustainable Energy Systems protection

				CO3: Identify different types of natural resource pollution and control measures
				CO4: Correlate the exploitation and utilization of conventional and non-conventional