3rd Semester

Course Name: Data Structures using 'C'

Course Code :21BTTES307

Course outcomes:

CO1: Analyze performance of algorithms and implement various operations on array and sparse matrix.

CO2: Apply the basic operations of stacks and queues to solve real world problems.

CO3: Implement different types of linked list operations and their applications.

CO4: Represent data using trees & graphs to use them in various real life applications.

CO5: Analyze various sorting algorithms and explore different hashing techniques.

Mapping with Program Outcomes (POs)											
PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
1	3										
1		3									
3	2	2									
3		1									
2	3										

Course Name: Object Oriented Programming Using Java

Course Code: 21BTCSETPC301

Course outcomes:

CO1: Knowledge of the structure and model of the Java programming language, (knowledge)

CO2: Use the Java programming language for various programming technologies (understanding)

CO3: Develop software in the Java programming language, (application)

CO4: Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements (analysis)

CO5: Propose the use of certain technologies by implementing them in the Java programming language to solve the given problem (synthesis).

CO6: Choose an engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems. (evaluation)

Mapping with Program Outcomes (POs)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	3										
CO2	2	2										
CO3			2			3						2
CO4		3			3							
CO5		2	3									
CO6	2			3								

Course Name: Computer Organization & Architecture

Course Code: 21BTCSETPC302

Course outcomes:

CO1: To draw the functional block diagram of single bus architecture of a computer.
CO2: To describe the function of the instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set.

CO3: To know the design concept of Control unit and operation of ALU.

CO4: To Analyze cache performance, cache optimizations, memory technologies, Protection via virtual memory and virtual machine

CO5: To assess the performance of a given CPU organization, and apply design techniques to enhance performance using pipelining and parallelism.

Mapping with Program Outcomes (POs)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2										
CO2	2	3	1									
CO3		2	3	1								
CO4	2	3										
CO5	2	3										

Course Name: Data Structures using 'C' Lab

Course Code :21BTPES309

Course Outcomes:

CO1: Implement array operations to solve problems
CO2: Understand stack operations using programming
CO3: Implementation of queue and its operations
CO4: Apply Liked list to solve problems
CO5: Apply tree concept to design the model
CO6: Implement graph to solve routing problems.

Mapping with Program Outcomes (POs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1								
CO2	3	3	3	2								
CO3	3	2	2	2								
CO4	3	2	1	1								
CO5	2	2	1	1								
CO6	2	1	2	3								

Course Name: Object Oriented Programming Using Java Lab

Course Code: 21BTCSEPPC301

Course Outcomes:

CO1: Implement Object oriented features using Java
CO2: Apply the concept of polymorphism and inheritance.
CO3: Implement exception handling
CO4: Develop window-based application using Swing.

Mapping with Program Outcomes (POs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										
CO2			2	3								
CO3			3	3								
CO4	1	2	2		3							

Course Name: Computer Organization and Architecture Lab

Course Code : 21BTCSEPPC302

Course Outcomes:

1. Ability to demonstrate an understanding of the design of the functional units of a digital computer system.
2. Ability to Assemble a new computer system and dis assemble it.
3. To learn about SMPS and gain knowledge about power system of a computer system.
4. To gain knowledge on assembly programming with simulation approach.
5. To gain knowledge on different errors created in a computer system and approaches to resolve.
6. To understand the cache memory organization using simulator.
7. To understand ALU operation using simulator..

Mapping with Program Outcomes (POs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1								
CO2	3	1	2	1								
CO3	2		2	1								
CO4	3	3	2	2								
CO5	2	2		2								
CO6	2	2	2	1								
CO7	2		2	1								

4th Semester

Course Name: Design and Analysis of Algorithm

CourseCode:21BTCSETPC403

CourseOutcomes: Attheendofthecourse,thestudentswillbeableto:

CO1: Analyzetheasymptoticperformanceofalgorithms

CO2: Understanddifferent algorithmdesigntechniques

CO3: Applyimportantalgorithmicdesignparadigmsandmethodsofanalysis

CO4: Demonstratefamiliaritywithmajor algorithmsanddata structures

CO5: Evaluatedifferentclasses ofproblems:P,NP,NPCompleteandNPHard

CO6: Developalgorithmstoapplyincommon engineeringdesignsituations

Mapping with Program Outcomes (POs)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	3	2									
CO2	3	2	2									1
CO3	2	3	2									1
CO4	1	2	2									
CO5	1	1										
CO6	2	2	3									2

CourseName:**DatabaseEngineering**

CourseCode:**21BTCSETPC404**

Courseoutcomes:

CO1: Differentiatethe databaseconceptsfromconventionalfilestoragesystemanddescribeDBMSarchitecture,relational ,hierarchicalandnetworkdatabasemodels

CO2: AnalyseapplicationdatausingE-Rmodellinganddescribethelogicalandphysicaldatabasedesigns.

CO3: Understandrelationalalgebra,calculus andapplystructured querylanguage(SQL)fordatabasedefinitionandmanipulation.

CO4: Demonstrateanunderstandingof normalizationtheoryandapplysuchknowledgetothenormalizationof adatabase.

CO5: Usetransactionmanagementsystemsandrecovermethods.

MappingwithProgramOutcomes(POs)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3											
CO2	1	3	2									
CO3	3		2									
CO4	2		2									
CO5	2					2				1		

Course Name: Data Communication & Computer Networks

Course Code : 21BTCSETPC405

Courseoutcomes:

CO1: Analyzetheconceptsofnetworks,typesandarchitectures

CO2: Explainvarioustechniquesandmodesoftransmission(AnalogandDigital).

CO3: Identifyerrorfreetransmissionofdataandanalysedatacollisionwithvariousprotocols.

CO4: DescribeIPv4& IPv6addressingschemes,subnets,routingprinciplesandalgorithmsusedinthenetworklayer.

CO5: Explaintheprotocols oftransport&application layersandunderstandtheworkingprinciples ofInternet&theWorldWideWeb.

CO6:Illustratetherealtimeapplicationsofnetworks

MappingwithProgramOutcomes(POs)											
PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
3		2									
3	3										
3	3										
3			3								3
3	3	3	3								3
3	2		1	2							

Course Name: Advanced Computer Architecture

Course Code : 21BTCSETPE401

CourseOutcomes:

CO1: Understandthecost, performance, TrendsinTechnology, powerinIntegratedCircuitsandPrinciplesof computerdesign.

CO2: Analyzetheworkingofpipelining,exploringinstructionlevelparallelism usingstatic,dynamic&advancedtechniquesofschedulingandanalyzethetechniquestoexplore Instructionlevelparallelismandreducingthecost&hazards using dynamicscheduling.

CO3: Analyzemultiprocessors&threadlevelparallelismusingshared,distributedanddirecto rybasedmemorymodels.

CO4: Analyze cache performance,cache optimizations,memory technologies,Protection viavirtualmemoryandvirtualmachine.

CO5: Understandthenetworkingandroutingforparallelsystemwithstudyofdistributedcomputingandcloud computingarchitecture.

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	3	2	3	2	3	2			2	1	1
CO2	3	3	2	2	2	1			2	1	1
CO3	2	2	3	2	3					1	
CO4	3	3	3	2	3				1	1	1
CO5	2	3	3	2	3	1			1	2	1

Course Name: Design and Analysis of Algorithm Lab

Course Code : 21BTCSEPPC404

CourseOutcomes

CO1: Designalgorithmsusingappropriatedesigntechniques(brute-force,greedy,dynamicprogramming,etc.)

CO2: Implementavarietyofalgorithmssuchassorting, graphrelated, combinatorial, etc.,ina highlevellanguage.

CO3: Analyseandcomparetheperformanceof algorithmsusinglanguagefeatures.

CO4: Apply and implement learned algorithm design techniques and data structures to solve real-worldproblems.

MappingwithProgramOutcomes(POs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3									1
CO2	2	3	3									
CO3	1	3	2									1
CO4	2	3	3									1

Course Name: Database Engineering Lab

Course Code: 21BTCSEPPC405

CourseOutcomes:

CO1: Apply the concept for database design, create database, and develop queries**CO2:** Implementdifferentdatabaseprogramsusingprocedures,function,andcursor.

CO3: Implementdatabasefeaturessuchastriggers,packagesetc.

CO4: ImplementODBC/JDBCconnectivitywithprogramminglanguagesandwriteprogramstostoreandretrievedatabyusingqueries.

CO5: Usetransactionmanagement systemsandrecoverymethods.

MappingwithProgramOutcomes(POs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											
CO2	1	3	2									
CO3	3		2									
CO4	2		2									
CO5	2					2				1		

Course Name: Data Communication & Computer Network Lab

Course Code : 21BTCSEPPC406

CourseOutcomes

CO1: Experiment with transmission media, connector, Hubs, Switches and installation of NIC.

CO2: Implement client server applications with TCP/UDP Socket Programming in a standalone machine and over a network.

CO3: Apply HTTP over TCP/UDP connection with help of a Browser.

CO4: Simulate Datalink layer protocols using NetSim/NS3.

CO5: Develop applications to communicate over heterogeneous networks (Internet).

MappingwithProgramOutcomes(POs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	2							2
CO2	3	2	3	2	2							2
CO3	2	2	3	2	3							2
CO4	2	3	3	3								
CO5	2	2	2	2								

5th Semester

Course Name: Operating Systems

Course Code : 21BTCSETPC506

Course outcomes:

Students will be able to:

CO1:-Explain the types of operating system and ability to create threads.

CO2:- Understand CPU scheduling and and perform interprocess communication.

CO3 :-Understand issues surrounding deadlock handling and able to solve process synchronization problems

CO4:- Explain paging and segmentation methods suitable for virtual memory.

CO5:- Be able to recover and manage disk spaces. Ability to manage files and directory Knowledge of files systems.

Mapping with Program Outcomes (POs)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	1	1	1							
CO2	1	1	1	2							1	
CO3	1	2	3								1	
CO4	1	1		2	2							
CO5	1	2	2	2								

Course Name: Formal Language & Automata Theory

Course Code: 21BTCSETPC507

Course outcomes:

At the end of this course, the students will be able to:

CO 1: Develop and implement mathematical models with DFA, NFA for regular languages and grammar for real life applications.

CO 2: Examine the properties of formal language and automata, their equivalence and conversion techniques

CO 3: Classify and construct grammars for different languages and vice-versa.

CO 4: Construct Turing machines for context sensitive and un-restricted languages.

CO 5: Illustrate the relevance of the Church-Turing thesis, explain the concept of decidability & recursive enumerability, and classify a given language to the P, NP or NPC complexity classes.

Mapping with Program Outcomes (POs): (1: Low, 2: Medium, 3: High)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	2	1							2
CO2	3	2	3	1	3							2
CO3	3	3	3	2	3							2
CO4	2	3	2	2								2
CO5	2	2	2	3								1

Course Name: ADVANCED JAVA

Course Code : 21BTCSETPC508

Course Outcomes:

CO1: Design a desktop application which can used for many kind of clients.
CO2: Develop an application which can also be connected with the database.
CO3: To learn Server-Side Programming using Servlets and Java Server Pages.

CO4: Design a web application which can work as a dynamic web with the help of JDBC.
CO5: To learn the operations perform on data among web applications.

Mapping with Program Outcomes (POs) Low = 1, Medium = 2 , High =3												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	3	1	1	1			2			
CO2	2	2	3	2	1	1			2			
CO3	3	2	3	2	2	1			2			
CO4	2	1	3	2	3	2			2			2
CO5	2	3	3	3	3	3			3	1	1	3

Course Name: Internet & Web Technology

Course Code : 21BTCSETPC509

Course outcomes:

By the end of this course students will be able to:

CO1:-Describe the concepts of World Wide Web, and the requirements of effective web design.

CO2:-Develop web pages using the HTML and CSS features with different layouts as per need of applications.

CO3:-Use the JavaScript to develop the dynamic web pages

CO4:-Understand and use XML in web development

CO5:-Understand and use PHP in web development.

Mapping with Program Outcomes (POs)												
COn	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2		1								
CO2	1	2	1	2								
CO3	1	2	3	1								
CO4	1	1	1	2	2							
CO5	1	2	2	2		1						2

Course Name: Machine Learning

Course Code : 21BTCSETPE504

Course Outcomes:

CO1 Apply supervised learning to solve related real-life problems.

CO2 Analyse a problem and select the most suitable supervised model for the same.

CO3 Apply classification & regression models such as SVM and decision models.

CO4 Preform clustering of given data with extraction of important features.

CO5 Apply the concepts of reinforcement learning to solve relevant real-life problems

Mapping with Program Outcomes (POs) Low = 1, Medium = 2 , High =3												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	1								
CO2	2	3		2	1							
CO3	3		2									
CO4	2	1		2								
CO5	2	1	1	2								

Course Name: Micro Processor and Micro Controller

Course Code : 21BTCSETOE501

Course outcomes:
Students will be able to:
CO1: Explain the architecture, pins & signals, programming model, instruction execution of 8085 Micro-processor and its interfacing with memory and I/O devices.
CO2: Explain the architecture, pins & signals, programming model, instruction execution of 8086 Micro-processor and its interfacing with memory and I/O devices.
CO3: Explain the concepts of embedded ICs, RISC and CISC processors and 8051 Micro-controller to solve simple problems using assembly language programming.
CO4: Design Micro-controller based interfacing for different applications.
CO5: Demonstrate peripheral interfacing with advanced programming of Micro-processors and Micro-controllers for real-time applications.

Mapping with Program Outcomes (POs)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2									
CO2	3	2	2			2						
CO3	3	3	2									
CO4	2	3	3			1						1
CO5	2	3	3			1						1

Course Name: Operating system Lab

Course Code : 21BTCSEPPC508

CO1: Read, understand and trace the execution of various unix commands and editors.

CO2: Develop programs using Shell Programming.

CO3: Analyze the performance of various CPU Scheduling Algorithms.

CO4: Implement various memory allocation methods.

CO5:-Analyze the performance of the various Page Replacement Algorithms.

Mapping with Program Outcomes (POs)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	3	1							1	
CO2	2	3	3	2							1	
CO3	3	2	3	1							1	
CO4	3	2	2	1							1	
CO5	2	3	3	2							1	

Course Name: Advanced JAVA Programming Lab

Course Code: 21BTCSEPPC509

Course Outcomes:

1. Develop an application which can also be connected with the database.
2. To learn Server-Side Programming using Servlets and Java Server Pages.
3. Design a web application which can work as a dynamic web with the help of JDBC.
4. To learn the operations perform on data among web applications.

Mention the modified / newly topics added in the syllabus:

NIL

Mapping with Program Outcomes (POs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2							2			
CO2	3	2							2			
CO3	2	1	3	2	3	2			2			2
CO4	2	3	3	3	3	3			3	1	1	3

Course Name: Web Technology Lab

Course Code : 21BTCSEPPC510

CO1: Develop web pages using HTML, DHTML and Cascading Styles sheets
CO2: Develop web pages using HTML, DHTML and Cascading Styles sheets.
CO3 :Develop a dynamic web pages using JavaScript (client side programming).
CO4 :Develop an interactive web applications using ASP.NET.
CO5 :Build and consume web services.
CO6 :Develop a Program using XML.

Mapping with Program Outcomes (POs)

Cos	PO1		PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2									
CO2	3	3	1		2							2
CO3	3	2	2									
CO4	2	2	3									2
CO5	2	1	3		3							
CO6	1	2	2		2							2

Course Name: Software Engineering

Course Code : 21BTCSETPC610

Course outcomes:
Students will be able to:
CO1: Describe fundamentals of software engineering and life cycle models and building of software products based on their characteristics.

CO2: Apply various requirement analysis tools for the requirement engineering process

CO3: Create high-level & detail-level design of a software using various design methodologies..

CO4: Code, review, test and maintain software products confirming to quality standards

CO5: Maintain software products confirming to quality standards

Mapping with Program Outcomes (POs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1		2		1	2	1			
CO2	3	2	2		2		3	3	2			
CO3	2	3	2		2		2	2	2			
CO4	2	3	3		2		2	2	2			
CO5	2	3	3		2		1	2	1			

Course Name: Compiler Design

Course Code : 21BTCSETPC611

Course Outcomes:

Upon completion of the course, graduates will be able to –

CO1: Review different phases and passes of compiler and its underlying formal models such as finite stateautomata, and their connection to language definition through regular expressions and grammars.

CO2: Differentiate various parser construction techniques.

CO3: Able to use formal attributed grammars for specifying the syntax and semantics of programming languages and able to generate intermediate code generation.

CO4: Able to generate the code for the target machine.

CO5: Use code optimization techniques to improve the performance of a program in terms of speed & space.

Mapping with Program Outcomes (POs)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2										2
CO2	1	2										
CO3	2	1	3								2	2
CO4	2	2	2								2	3
CO5	2	2	2									1

Course Name: Internet Of Things

Course Code : 21BTCSETPE607

Course outcomes:

Students will be able to:

CO1. Describe various layers of IoT protocol stack and describe protocol functionalities.

CO2. Evaluate efficiency trade-offs among alternative communication models for an efficient IoT application design.

CO3. Comprehend advanced IoT applications and technologies from the basics of IoT.

CO4. Understand working principles of various sensor for different IoT platforms.

CO5. Estimate the cost of hardware and software for low cost design IoT applications.

Mapping with Program Outcomes (POs)												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2							3		2
CO2	2	3	3	3								
CO3	3	2										
CO4	2	3	3									
CO5	2	3	2									

Course Name: Cloud Computing

Course Code : 21BTCSETPE610

Course Outcomes:

CO1: Articulate the main concepts, key technologies, strengths, and limitations of cloud computing
CO2: Discuss several applications for state-of-the-art cloud computing
CO3: Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
CO4: Explain the core issues of cloud computing such as security, privacy, and interoperability.
CO5: Provide the appropriate cloud computing solutions and recommendations according to the applications used.

Mapping with Program Outcomes (POs) Low = 1, Medium = 2 , High =3												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	1	2				1			2
CO2	2	3	2	2	1				2			1
CO3	3	3	2									1
CO4	2	1		2				2	1			2
CO5	2	1	1	1					1			2

7th Semester

7th Semester	21BTTHS606	Entrepreneurship Development	L-T-P 3-0-0	Credit 3

After reading this subject, students will be able to:

CO1	Know the various concepts related to entrepreneurship and intrapreneurship and know their classifications.
CO2	Able to identify opportunities in the market according to the entrepreneurial environments.
CO3	Get knowledge about the capital flow and its management to start up and run a business.
CO4	Identify the shortfalls and causes of business failures.
CO5	Get knowledge about different policies made by Government and other regulatory authorities.

CO-PO Matrices												
Sl No	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	-	-	-	1	-	2	1	3	1	1	1	3
CO2	1	-	2	3	3	3	2	3	3	1	2	3
CO3	-	-	-	1	3	3	-	1	1	1	3	3
CO4	1	-	2	3	3	3	2	3	3	1	3	3
CO5	-	-	-	-	-	3	3	3	1	1	3	3
Avg.	**1**	**-**	**2**	**2**	**3**	**2.8**	**2**	**2.6**	**1.8**	**1**	**2.4**	**3**

Course Name: Cryptography and Network Security

Course Code : 21BTCSETPE713

Course outcomes:

CO1:-Identify security objectives & threats and enumerate necessary services & mechanisms foreffective counter measures.

CO2:-Explain the mathematical foundation of cryptography through modular arithmetic, linear algebra, number theory, factorization and discrete logarithm.

CO3:-Analyze the performance of traditional symmetric key cryptography techniques and modern symmetric key ciphers like DES and AES.

CO4:-Apply public key cryptography and Hash algorithms in encryption, data integrity, authentication, digital signature, and key exchange.

CO5:-Apply cryptography techniques in various network security protocols like SSL, TLS, PGP,S/MIME, and IPsec and understand E-mail Security.

Mapping with Program Outcomes (POs)												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2	1	1						3		3
CO2	3	3	1	1						3		3
CO3	3	3	3	2		2				3		2
CO4	3	3	3	2		2				3		3
CO5	1	3	3	2		2				3		3

Course Name: Computer Graphics

Course Code : 21BTCSETPE717

Course outcomes:

By the end of this course students will be able to:

CO1:Describe the basics of computer graphics and its applications.

CO2: Explore the standard line, circle, and area filling algorithms.

CO3: Design various transformation models in 2D and 3D spaces.

CO4: Apply the design principles to generate curves and mapping using projection.

CO5: Explore hidden lines and surface detection techniques with color models.

Mapping with Program Outcomes (POs)												
COn	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	1	2	1					1	1	1	2
CO2	3	1	2	1			1			2	1	3
CO3	3	2	3	2								
CO4	1	1	2			2						
CO5	3	2	2	1			1			2		1

Course Name: ARTIFICIAL INTELLIGENCE

Course Code : 21BTCSETOE707

Course outcomes:

By the end of this course students will be able to:

CO1:-Ability to comprehend AI to analyze and map real-world activities to the digital world

CO2:-Ability to identify problems that are amenably solved by AI methods

CO3:-Understand probabilistic reasoning and knowledge representationtechniques.

CO4:-Ability to design and carry out an empirical evaluation of different AI algorithms by using different learning methods.

CO5:-Understand the concept of expert system and Natural Language Processing.

Mapping with Program Outcomes (POs) Low = 1, Medium = 2 , High =3												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	1	3	-	-	-	-	-	-	
CO2	2	2	1	3	1	-	-	-	-	-	-	
CO3	3	3	2	2	3	-	-	-	-	-	-	
CO4	2	2	1	1	3	-	-	-	-	-	-	
CO5	3	3	2	2	3	-	-	-	-	-	-	

Course Name: Real Time System

Course Code : 21BTCSETOE713

Course outcomes:

By the end of this course students will be able to:

CO1:-Enumerate the need and the challenges in the design of hard and soft real time systems.

CO2:-Compare different scheduling algorithms and the schedulability criteria.

CO3:- Determine schedulability of a set of periodic tasks given a scheduling algorithm.

CO4:-Apply the basics of RTOS in interpretation of real time systems and real time databases.

CO5:-Interpret the basics of real time communication by the knowledge of real time models and protocols and Integrate resource access mechanisms with the scheduling techniques and develop integrated schedulibility criteria.

Mapping with Program Outcomes (POs)												
COn	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	2	3	1	1						
CO2	3	1	3	3	1	1						
CO3	3	1	3	3	1	1						
CO4	3	1	3	3	1	1						
CO5	3	1	2	3	1	1						

Course Name: Data Analytics

Course Code: 21BTCSETOE710

Course outcomes: After completion of this course, students would be able to:

CO1: Explain how data is collected, managed and stored for data science

CO2: Understand the data, performing preprocessing, processing, and data visualization to get insights from data.

CO3: Use different python packages for mathematical, scientific applications and for web data analysis.

CO4: Perform data wrangling with scikit-learn applying exploratory data analysis.

CO5: Develop the model for data analysis and evaluate the model performance.

Mapping with Program Outcomes (POs)												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3								2
CO2	3	3	2	3				2				2
CO3	3	2	2	2								1
CO4	3	2	2	1				1				1
CO5	2	2	1	1				1				1