2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER

IV Semester: 2021-2022 (EVEN Sem)

Course Name: Complex Analysis, Probability And Statistical Methods
Course Code: 18MAT41/C401

Cos	Statements
C401.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C401.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C401.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
C401.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C401.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	2		2									3	2	
CO2	3	2		1									2	3	
CO3	3	2	3	1									3	2	
CO4	2	1	3	1									2	2	
CO5	3	2	3	1									3	3	
Avg	2.6	1.8	3	1.2									2.6	2.4	

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER

IV Semester: : 2021-2022 (EVEN Sem)

Course Name: Design and Analysis of Algorithms
Course   Code: 18CS42 /C402

Cos	Statements
C402.1	Describe computational solution to well known problems like searching, sorting etc.
C402.2	Estimate the computational complexity of different algorithms.
C402.3	Devise an algorithm using appropriate design strategies for problem solving.
C402.4	Applying Dynamic programming to solve the problems
C402.5	Demonstrate the Backtracking technique

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	1	3	1									2	3	
CO2	1		2										3	3	
CO3	3	1	3										2	2	
CO4	1		2	1									2	3	
CO5	2	1	1	1									2	2	
Avg	2	1	2.2	1									2.2	2.6	

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER

IV Semester: 2021-2022 (EVEN Sem)

Course Name: Operating Systems
Course Code: 18CS43 /C403

Cos	Statements
C403.1	Demonstrate need for OS and different types of OS
C403.2	Apply suitable techniques for management of different resources
C403.3	Use processor, memory, storage and file system commands
C403.4	Demonstrate about the Virtual Memory management
C403.5	Realize the different concepts of OS in platform of usage through case studies

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	2	2										3	2	
CO2	2	1	2										3	2	
CO3	1	2	3										3	2	
CO4	3	1	3	1									3	2	
CO5	1	1	3	2									3	2	
Avg	2	1.4	2.6	2.5									3	2	

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER

IV Semester: 2021-2022 (EVEN Sem)

Course Name: Microcontroller and Embedded Systems
Course Code: 18CS44 /C404

Cos	
C404.1	Describe the architectural features and instructions of ARM microcontroller
C404.2	Apply the knowledge gained for Programming ARM for different applications.
C404.3	Interface external devices and I/O with ARM microcontroller.
C404.4	Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C404.5	Develop the hardware /software co-design and firmware design approaches. Demonstrate the need of real time operating system for embedded system applications

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	2	3									3	2	
CO2	2	1	3	1									2	3	
CO3	1	3	3	2									1	3	
CO4	2	3	2	1									2		
CO5	1	3	3										1		
Avg	1.6	2.2	2.6	1.7									1.8	2.6	

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER

IV Semester:2021-2022 (EVEN Sem)

Course Name: Object Oriented Concepts
Course Code:18CS45/C407

Cos	Statements
C407.1	Explain the object-oriented concepts and JAVA.
C407.2	Develop computer programs to solve real world problems in Java.
C407.3	Demonstrate class,Inheritance,Exception handling
C407.4	Develop packages and Interfaces
C407.5	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swings.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	2											3	2	
CO2	1	1	3										3	3	
CO3	2	2	3										2	2	
CO4	2	1	3										3	3	
CO5	2	2	3										2	2	
Avg	2	1.6	3										2.6	2.4	

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER

IV Semester: 2021-2022 (EVEN Sem)

Course Name: : Data Communication
Course Code: : 18CS46/C408

Cos	Statements
C408.1	Explain the various components of data communication.
C408.2	Explain the fundamentals of digital communication and switching.
C408.3	Demonstrate the bandwidth utilization,switching and other techniques
C408.4	Compare and contrast data link layer protocols.
C408.5	Summarize IEEE 802.xx standards

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO 3
CO1	3											2	2		
CO2		2			3							2	2		
CO3		3			2								3		
CO4		3	2		3								2		
CO5		3	2										2		
Avg	3	2.7	2		2.6							2	2.2		

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

8th Semester

COURSE NAME: DESIGN OF PRE-STRESSECONCRETE

COURSE CODE: 18CV81(C801)

COs	STATEMENTS
C801.1	Understand the requirement of PSC members for present scenario.
C801.2	Analyze the stresses encountered in PSC element during transfer and at working.
C801.3	Understand the effectiveness of the design of PSC after studying losses.
C801.4	Capable of analyzing the PSC element and finding its efficiency.
C801.5	Design PSC beam for different requirements.

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

8th Semester

COURSE NAME: REHABILITATION AND RETROFITTING

COURSE CODE: 18CV824(C802)

COs	STATEMENTS
C802.1	Identify the causes for structural (Concrete) deterioration.
C802.2	Assess the type and extent of damage and carry out damage assessment of structures through various types of tests.
C802.3	Recommend maintenance requirements of the buildings and preventive measures against influencing factors.
C802.4	Select suitable material and suggest an appropriate method for repair and rehabilitation.

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

8th Semester

COURSE NAME: PROJECT WORK PHASE-2

COURSE CODE: 18CVP83(C803)

COs	STATEMENTS
C803.1	Describe the project and be able to defend it
C803.2	Develop critical thinking and problem-solving skills
C803.3	Learn to use modern tools and techniques.
C803.4	Communicate effectively and to present ideas clearly and coherently both in written and oral forms.
C803.5	Develop skills to work in a team to achieve common goal.
C803.6	Develop skills of project management and finance.
C803.7	Develop skills of self-learning, evaluate their learning and take appropriate actions to improve it.
C803.8	Prepare them for life-long learning to face the challenges and support the technological changes to meet the societal needs.

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

6th Semester

COURSE NAME: DESIGN OF STEEL STRUCTURAL ELEMENTS

COURSE CODE: 18CV61(C601)

COs	STATEMENTS
C601.1	Possess knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel.
C601.2	Understand the Concept of Bolted and Welded connections.
C601.3	Understand the Concept of Design of compression members, built-up columns and columns splices.
C601.4	Understand the Concept of Design of tension members, simple slab base and gusseted base.
C601.5	Understand the Concept of Design of laterally supported and un-supported steel beams.

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

6th Semester

COURSE NAME: APPLIED GEOTECHNICAL ENGINEERING

COURSE CODE: 18CV62(C602)

COs	STATEMENTS
C602.1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
C602.2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
C602.3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
C602.4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
C602.5	Capable of estimating load carrying capacity of single and group of piles

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

6th Semester

COURSE NAME: HYDROLOGY AND IRRIGATION ENGINEERING

COURSE CODE: 18CV63(C603)

COs	STATEMENTS
C603.1	Understand the importance of hydrology and its components.
C603.2	Measure precipitation and analyze the data and analyze the losses in precipitation
C603.3	Estimate runoff and develop unit hydrographs.
C603.4	Find the benefits and ill-effects of irrigation
C603.5	Find the quantity of irrigation water and frequency of irrigation for various crops.
C603.6	Find the canal capacity, design the canal and compute the reservoir capacity.

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

6th Semester

COURSE NAME: SOLID WASTE MANAGEMENT

COURSE CODE: 18CV642(C604)

COs	STATEMENTS
C604.1	Analyse existing solid waste management system and to identify their drawbacks.
C604.2	Evaluate different elements of solid waste management system.
C604.3	Suggest suitable scientific methods for solid waste management elements.
C604.4	Design suitable processing system and evaluate disposal sites.

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

6th Semester

COURSE NAME: NON-CONVENTIONAL ENERGY SOURCES

COURSE CODE: 18ME651(C605)

COs	STATEMENTS
C605.1	Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
C605.2	Know the need of renewable energy resources, historical and latest developments.
C605.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.
C605.4	Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
C605.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications
C605.6	Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.
C605.7	Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications

_____

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

6th Semester

COURSE NAME: SOFTWARE APPLICATION LABORATORY

COURSE CODE: 18CVL66 (C606)

COs	STATEMENTS
C606.1	use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

6th Semester

COURSE NAME: ENVIRONMENTAL ENGINEERING LABORATORY

COURSE CODE: 18CVL67 (C607)

COs	STATEMENTS
C607.1	Acquire capability to conduct experiments and estimate the concentration of different parameters.
C607.2	Compare the result with standards and discuss based on the purpose of analysis.
C607.3	Determine type of treatment, degree of treatment for water and waste water.
C607.4	Identify the parameter to be analyzed for the student project work in environmental stream.

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (EVEN)

6th Semester

COURSE NAME: EXTENSIVE SURVEY PROJECT

COURSE CODE: 18CVEP68 (C608)

COs	STATEMENTS
C608.1	Apply Surveying knowledge and tools effectively for the projects
C608.2	Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, technical and behavioral competencies.
C608.3	Application of individual effectiveness skills in team and organizational context, goal setting, time management, communication and presentation skills.
C608.4	Professional etiquettes at workplace, meeting and general
C608.5	Establishing trust-based relationships in teams & organizational environment
C608.6	Orientation towards conflicts in team and organizational environment, Understanding sources of conflicts, Conflict resolution styles and techniques

Department of Computer Science and Engineering

**2.6.1QlM Programme Outcomes (POs) and Course Outcomes (COs) offered by the department-
EVEN Semester
Academic Year 2021-2022**

SL NO	SEMESTER	SUBJECT/SUBJECT CODE
1	4	Complex Analysis, Probability and Statistical Methods(18MAT41)
2		Design and Analysis of Algorithms (18CS42)
3		Operating System(18CS43)
4		Microcontroller And Embedded Systems (18CS44)
5		Object Oriented Concepts(18CS45)
6		Data Communication(18CS46)
7		Design and Analysis of Algorithm Laboratory(18CSL47)
8		Microcontroller and Embedded Systems Laboratory(18CSL48)
9	6	System Software and Compilers (18CS61)
10		Computer Graphics and Visualization(18CS62)
11		Web Technology and its applications(18CS63)
12		Data Mining and Data Warehousing(18CS641)
13		Conservation Of Natural Resources (18ME651)
14		System Software Laboratory(18CSL66)
15		Computer Graphics Laboratory with Mini Project (18CSL67)
16		Mobile Application Development(18CSMP68)
17	8	Internet of things and applications(18CS81)
18		Storage Area Network(18CS822)

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-IV

Course Name: Complex Analysis, Probability and Statistical Methods   Course Code: 18MAT41/C401

Cos	Statements
C401.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C401.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C401.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
C401.4	Apply greedy and input enhancement methods to solve graph & string based computational problems.
C401.5	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C401.6	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	1
CO2	2	2	1	1	1				2	1		2	1	1	3
CO3	3	3	3	1	1					1		2	2	2	2
CO4	3	3	3	3	1	1		1	1	3		2	3	1	1
CO5	2	3	3	1	2					1		3	2	1	2
AVG	2.6	2.4	2.2	1.4	1.2	1	0	1	1.5	1.5	0	2	1.8	1.2	1.8

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-IV

Course Name: Design and Analysis of Algorithms   **Course Code: 18CS42/C402**

Cos	Statements
C402.1	Describe computational solution to well known problems like searching, sorting etc.
C402.2	Estimate the computational complexity of different algorithms.
C402.3	Devise an algorithm using appropriate design strategies for problem solving.
C402.4	Apply appropriate method to solve a given problem.
C402.5	Describe various methods of algorithm analysis.

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	3	1								1	1	1
CO2	2	2	1	2	1								1	1	3
CO3	3	3	3	3	1								2	2	2
CO4	3	3	3	2	1								3	1	1
CO5	2	3	3	3	2								2	1	2
AVG	2.6	2.4	2.2	2.6	1.2	0	0	0	0	0	0	0	1.8	1.2	1.8

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-IV

Course Name: Operating Systems   **Course Code: 18CS43/C403**

Cos	Statements
C403.1	Demonstrate need for OS and different types of OS
C403.2	Apply suitable techniques for management of different resources
C403.3	Use processor, memory, storage and file system commands
C403.4	Analyse various normalization forms for the given application.
C403.5	Realize the different concepts of OS in platform of usage through case studies

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1	1							1	2	1
CO2	3	1	1	1								2	2	1	2
CO3	3	3	3	3	1								3	3	3
CO4	1	3	3	1	1								2	2	2
CO5	3	3	3	1	3	3						1	3	3	3
AVG	2.6	2.2	2.2	1.4	1.5	2	0	0	0	0	0	1.5	2.2	2.2	2.2

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-IV

Course Name: Microcontroller and Embedded Systems　　　　　　　　**Course Code 18CS44/C404**

Cos	Statements
C404.1	Describe the architectural features and instructions of ARM microcontroller
C404.2	Apply the knowledge gained for Programming ARM for different applications.
C404.3	Interface external devices and I/O with ARM microcontroller. Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C404.4	Develop the hardware /software co-design and firmware design approaches.
C404.6	Demonstrate the need of real time operating system for embedded system applications

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1									1	1	1
CO2	1	1	1	1								2	1	1	2
CO3	2	2	3	2	2						1	1	2	2	2
CO4	2	2	1	2							1	1	2	2	2
CO5	2	2	2	1										1	1
AVG	1.6	1.6	1.6	1.4	2	0	0	0	0	0	1	1.3	1.5	1.4	1.6

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-IV

Course Name: Object Oriented Concepts   **Course Code 18CS45/C405**

Cos	Statements
C405.1	Explain the object-oriented concepts and JAVA.
C405.2	Develop computer programs to solve real world problems in Java.
C405.3	Set up Java JDK environment to create, debug and run simple Java programs .
C405.4	Create multi-threaded programs and event handling mechanisms.
C405.5	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swings.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	1								3	1	1	3
CO2	1	1	2	1								2	1	2	2
CO3	1	1	2	1								2	1	1	2
CO4	1	1	1	1								2	1	2	1
CO5	1	1	1	2								3	1	2	3
AVG	1	1	1.6	1.2	0	0	0	0	0	0	0	2.4	1	1.6	2.2

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-IV

Course Name: Data Communication   **Course Code 18CS46/C406**

Cos	Statements
C406.1	Explain the various components of data communication.
C406.2	Explain the fundamentals of digital communication and switching.
C406.3	Compare and contrast data link layer protocols.
C406.4	Demonstrate Medium Access Control protocols for reliable and noisy channels.
C406.5	Summarize IEEE 802.xx standards .

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1					1			1	3	1	1	3
CO2	3	1	1					1		1	1	2	1	2	2
CO3	3	2	1					1		1		2	1	1	2
CO4	3	1	1							1		2	1	2	1
CO5	2	1	1					1				3	1	2	3
AVG	1.8	1.2	1	0	0	0	2.8	1	0	1	1	2.4	1	1.6	2.2

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-IV

Course Name: Design and Analysis of Algorithm Laboratory   Course Code 18CSL47/C407

Cos	Statements
C407.1	Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
C407.2	Implement a variety of algorithms such assorting, graph related, combinatorial, etc., in a high level language.
C407.3	Analyze and compare the performance of algorithms using language features.
C407.4	Measure and compare the performance of different algorithms.
C407.5	Apply and implement learned algorithm design techniques and data structuresto solve real-world problems.

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-IV

Course Name: Microcontroller and Embedded Systems Laboratory   Course Code 18CSL48/C408

Cos	Statements
C408.1	Develop and test program using ARM7TDMI/LPC2148
C408.2	Conduct the following experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VI

Course Name: SYSTEM SOFTWARE AND COMPILERS   Course Code: 18CS61 /C601

Cos	Statements
C601.1	Explain system software
C601.2	Design and develop lexical analyzers, parsers and code generators
C601.3	Familiarize with source file, object file and executable file structures and libraries
C601.4	Describe the front-end and back-end phases of compiler and their importance to students
C601.5	Utilize lex and yacc tools for implementing different concepts of system software

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	1								3	1	1	3
CO2	1	1	2	1								2	1	2	2
CO3	1	1	2	1								2	1	1	2
CO4	1	1	1	1								2	1	2	1
CO5	1	1	1	2								3	1	2	3
AVG	1	1	1.6	1.2	0	0	0	0	0	0	0	2.4	1	1.6	2.2

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VI

Course Name: Computer Graphics and Visualization　　　　　**Course Code: 81CS62 /C602**

Cos	Statements
C602.1	Design and implement algorithms for 2D graphics primitives and attributes.
C602.2	Construct geometric objects using Computer Graphics principles and OpenGL APIs
C602.3	Illustrate Geometric transformations on both 2D and 3D objects.
C602.4	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.
C602.5	Decide suitable hardware and software for developing graphics packages using OpenGL.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1					1			1	3	1	1	3
CO2	3	1	1					1		1	1	2	1	2	2
CO3	3	2	1					1		1		2	1	1	2
CO4	3	1	1							1		2	1	2	1
CO5	2	1	1					1				3	1	2	3
AVG	1.8	1.2	1	0	0	0	2.8	1	0	1	1	2.4	1	1.6	2.2

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VI

Course Name: Web Technology and its applications   **Course Code: 18CS63/C603**

Cos	Statements
C603.1	Adapt HTML and CSS syntax and semantics to build web pages.
C603.2	Construct and visually format tables and forms using HTML and CSS
C603.3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
C603.4	Appraise the principles of object oriented development using PHP
C603.5	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	3
CO2	2	3	1	1	1							1	1	2	2
CO3	2	2	1	2	1							1	1	1	2
CO4	1	3	2	1	1							1	1	1	1
CO5	3	2	2	1	1							1	1	1	3
AVG	2.2	2.2	1.4	1.2	1	0	0	0	0	0	0	1	1	1.2	2.2

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VI

Course Name: Data Mining and Data Warehousing   **Course Code: 18CS641 /C604**

Cos	Statements
C604.1	Identify data mining problems and implement the data warehouse
C604.2	Write association rules for a given data pattern.
C604.3	Explain rules related to association, classification and clustering analysis.
C604.4	Compare and contrast between different classification and clustering algorithms
C604.5	Choose between classification and clustering solution.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1									1	1	1
CO2	1	1	1	1								2	1	1	2
CO3	2	2	3	2	2						1	1	2	2	2
CO4	2	2	1	2							1	1	2	2	2
CO5	2	2	2	1										1	1
AVG	1.6	1.6	1.6	1.4	2	0	0	0	0	0	1	1.3	1.5	1.4	1.6

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

<u>**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**</u>

<u>**ACADEMIC YEAR: 2021-22**</u>

<u>**EVEN SEMESTER-VI**</u>

Course Name: CONSERVATION OF NATURAL RESOURCES   **Course Code: 18ME651 /C605**

Cos	Statements
C605.1	Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
C605.2	Know the need of renewable energy resources, historical and latest developments.
C605.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.
C605.4	Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
C605.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VI

Course Name: System Software Laboratory   **Course Code: 18CSL66 /C606**

Cos	Statements
C606.1	To make students familiar with Lexical Analysis and Syntax Analysis phases of Compiler Design and implement programs on these phases using LEX & YACC tools and/or C/C++/Java
C606.2	To enable students to learn different types of CPU scheduling algorithms used in operating system.
C606.3	Implement and demonstrate Lexer"s and Parser"s .
C606.4	Evaluate different algorithms required for management, scheduling, allocation and communication used in operating system.

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VI

Course Name: COMPUTER GRAPHICS LABORATORY WITH MINI PROJECT   Course Code: 18CSL66 /C606

Cos	Statements
C606.1	Apply the concepts of computer graphics
C606.2	Implement computer graphics applications using OpenGL
C606.3	Animate real world problems using OpenGL .

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VI

Course Name: Mobile Application Development   **Course Code: 18CSMP68 /C606**

Cos	Statements
C606.1	Create, test and debug Android application by setting up Android development environment
C606.2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
C606.3	Infer long running tasks and background work in Android applications
C606.4	Demonstrate methods in storing, sharing and retrieving data in Android applications
C606.5	Describe the steps involved in publishing Android application to share with the world

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	3	1								1	1	1
CO2	2	2	1	2	1								1	1	3
CO3	3	3	3	3	1								2	2	2
CO4	3	3	3	2	1								3	1	1
CO5	2	3	3	3	2								2	1	2
AVG	2.6	2.4	2.2	2.6	1.2	0	0	0	0	0	0	0	1.8	1.2	1.8

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VIII

Course Name: Internet of things and applications   **Course Code: 18CS81/C801**

Cos	Statements
C801.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
C801.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
C801.3	Appraise the role of IoT protocols for efficient network communication.
C801.4	Elaborate the need for Data Analytics and Security in IoT
C801.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1								2	3	1	3
CO2	2	1	3	3	2	2			2	1		3	3	2	1
CO3	2	1	2	1	1	2			2	2		2	3	3	1
CO4	3	1	1	2	1	1			1	3		2	3	1	1
CO5	1	1	1	13	1	1			1	1	3	3	3	1	3
AVG	2.2	1	1.6	4	1.2	1.5	0	0	1.5	1.7	3	2.4	3	1.6	1.8

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

EVEN SEMESTER-VIII

Course Name: Storage Area Network　　　　　　　　　**Course Code: 18CS822/C802**

Cos	Statements
C802.1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
C802.2	Explain components and the implementation of NAS
C803.3	Describe CAS architecture and types of archives and forms of virtualization
C804.4	Illustrate the storage infrastructure and management activities
C805.5	Understand the various replication techniques and security implementation of SAN

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1	2	1						3	1	1	3
CO2	1	3	1	1	2					1		2	1	2	2
CO3	1	2	1	1	2					1	1	2	1	1	2
CO4	1	3		1	1					3	3	2	1	1	1
CO5	1	2		1	1							3	1	2	3
AVG	1	2.2	1	1	1.6	1	0	0	0	1.6	2	2.4	1	1.4	2.2

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - IV

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name   : Complex Analysis, Probability and Statistical Theory
Course Code   : 18MAT41

Cos	Statements
C301.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory
C301.2	Utilize conformal transformation and complex integral arising in aero foil theory, fluid flow visualization and image processing
C301.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field
C301.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data
C301.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1													
CO2	1													
CO3	1	1		1		1								
CO4	1													
CO5	1	1		1										
AVERAGE	1	0.4		0.4		1								

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - IV

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name   : Analog Circuits
Course Code   : 18EC42

Cos	Statements
C303.1	Understand the characteristics of BJTs and FETs.
C303.2	Design and analyze BIT and FET amplifier circuits
C303.3	Design sinusoidal and non-sinusoidal oscillators
C303.4	Understand the functioning of linear ICs
C303.5	Design of Linear IC based circuits

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1													
CO2	2			1		1							2	
CO3	2												2	
CO4	2			1									1	
CO5	2					1							2	
AVERAGE	1.8			0.4		0.4							1.4	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - IV

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name   : Control System
Course Code   : 18EC43

Cos	Statements
C304.1	Develop the mathematical model of mechanical and electrical systems.
C304.2	Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method
C304.3	Determine the time domain specifications for first and second order systems
C304.4	Determine the stability of a system in the time domain using Routh- Hurwitz criterion and Root-locus technique
C304.5	Determine the s stability of a system in the frequency domain using Nyquist and bode plots

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1												1	
CO2	1												1	
CO3	1			1		1							1	
CO4	1												1	
CO5	1												1	
AVERAGE	1			1		1							1	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - IV

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name   : Engineering Statics and Linear Algebra
Course Code   : 18EC44

Cos	Statements
C306.1	Analyze and evaluate single and multiple random variables
C306.2	Identify and associate Random Variables and Random Processes in Com-munication events
C306.3	Analyze and model the Random events in typical communication events to extract quantitative statistical parameters
C306.4	Analyze and model typical signal sets in terms of a basis function set of Amplitude, phase and frequency
C306.5	Demonstrate by way of simulation or emulation the ease of analysis em-ploying basis functions, statistical representation and Eigen values.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1				1		1								
CO2	1													
CO3	1			1										
CO4		1				1								
CO5	1												1	
AVERAGE	0.6	1		0.4		0.4							1	

_____

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - IV

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name   : Signals and Systems
Course Code   : 18EC45

Cos	Statements
C305.1	Analyze the different types of signals and systems
C305.2	Determine the linearity, causality, time-invariance and stability proper-ties of continuous and discrete time systems.
C305.3	Evaluate the convolution sum and integral
C305.4	Represent continuous and discrete signals & systems in frequency domain using Fourier representations
C305.5	Analyze discrete time signals and systems using Z-transforms

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1													
CO2	1			1		1								
CO3	1												1	
CO4	1			1		1								
CO5	1													
AVERAGE	1			0.4		0.4							1	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - IV

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Microcontroller
Course Code   : 18EC46

Cos	Statements
C305.1	Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, Interfacing of 8051 to external memory and Instruction set of 8051
C305.2	Write 8051 Assembly level programs using 8051 instructions set.
C305.3	Explain the Interrupt system, operation of Timers/Counters and Serial port of 8051
C305.4	Write 8051 Assembly language programs to generate square wave on 8051 I/O port pin using interrupt and C Programme to send & receive serial data using 8051 serial port

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1													
CO2				1		1							1	
CO3				1		1								
CO4				1		1								
AVERAGE	1			0.75		0.75							1	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

<u>ODD SEMESTER - IV</u>

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Microcontroller Laboratory
Course Code   : 18ECL47

Cos	Statements
C305.1	Enhance programming skills using Assembly language and C.
C305.2	Write Assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051.
C305.3	Interface different input and output devices to 8051 and control them using Assembly language programs
C305.4	Interface the serial devices to 8051 and do the serial transfer using C programming
C305.5	Develop applications based on Microcontroller 8051

Co-Po Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
CO1	1	1											2	
CO2	1			1										
CO3	2	1				1							1	
CO4	2												2	
CO5	2												2	
AVERAGE	1.6	0.4		1		1							1.4	

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - IV

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Analog Circuit Laboratory
Course Code : 18ECL48

Cos	Statements
C305.1	Analyze Frequency response of JFET/MOSFET amplifier
C305.2	Design BJT/FETs amplifier with and without feedback and evaluate their performance characteristics
C305.3	Apply the knowledge gained in the design of BJT/FET circuits in Oscillators
C305.4	Design analog circuits using OPAMPs for different applications
C305.5	Simulate and analyze analog circuits that uses ICs for different electronic applications

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1													
CO2	2												2	
CO3	1			1		1								
CO4	2			1		1							1	
CO5	1			1		1							1	
AVERAGE	1.4			0.6		0.6							0.8	

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VI

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Digital Communication
Course Code   : 18EC61

Cos	Statements
C605.1	Associate and apply the concepts of Band pass sampling to well specified Signals and channels
C605.2	Analyze and compute performance parameters and transfer rates for low pass and band pass symbol under ideal and corrupted non band limited channels
C605.3	Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted band limited channels
C605.4	Demonstrate that band pass signals subjected to corruption and distortion in a band limited channel can be processed at the receiver to meet specified performance criteria.
C605.5	Understand the principles of spread spectrum communications

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1			1		1							1	
CO2														
CO3			1			2							2	
CO4	2												2	
CO5	2			1		1								
AVERAGE	1		1	0.4		0.8							1	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VI

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Embedded System
Course Code   : 18EC62

Cos	Statements
C605.1	Describe the architectural features and instructions of 32-bit microcontroller ARM Cortex M3
C605.2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications
C605.3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C605.4	Develop the hardware /software co-design and firmware design approaches

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1										1	
CO2	1			1		1								
CO3	1													
CO4	1													
AVERAGE	1	1	1	1		1							1	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VI

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Microwave and Antenna
Course Code   : 18EC63

Cos	Statements
C605.1	Describe the use and advantages of microwave transmission
C605.2	Analyze various parameters related to microwave transmission lines and waveguides
C605.3	Identify microwave devices for several applications
C605.4	Analyze various antenna parameters necessary for building a RF system
C605.5	Recommend various antenna configurations according to the applications

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1	1								2	
CO2	2	1	1										1	
CO3	1		1	1									1	
CO4		1	2	2									1	
CO5	1	1	1										1	
AVERAGE	1.2	1.2	1.2	0.8	1								1.2	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VI

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Operating System
Course Code   : 18EC641

Cos	Statements
C605.1	Explain the goals, structure, operation and types of operating systems.
C605.2	Apply scheduling techniques to find performance factors
C605.3	Explain organization of file systems and IOCS.
C605.4	Apply suitable techniques for contiguous and non-contiguous memory allocation
C605.5	Describe message passing, deadlock detection and prevention methods.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1										1	
CO2	1	1	1										1	
CO3	2	1	1										1	
CO4	1	1	1		1								1	
CO5		1	1		1								1	
AVERAGE	1.2	1	1		1								1	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VI

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Python Application Programming
Course Code : 18EC646

Cos	Statements
C605.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions
C605.2	Demonstrate proficiency in handling Strings and File Systems
C605.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use regular Expressions.
C605.4	Interpret the concepts of Object-Oriented Programming as used in Python
C605.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1										1	1
CO2	2	2	1		1								1	
CO3	1	1	1	1										
CO4	1	1	1	1										
CO5	2	1	1	1		1							1	
AVERAGE	1.4	1.2	1	0.6	1	1							0.6	1

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VI

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Embedded System Laboratory
Course Code : 18ECL67

Cos	Statements
C605.1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language
C605.2	Develop assembly language programs using ARM Cortex M3 for different applications
C605.3	Interface external devices and I/O with ARM Cortex M3.
C605.4	Develop C language programs and library functions for embedded system applications
C605.5	Analyze the functions of various peripherals, peripheral registers andpowersavingmodesofARMCortexM3

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1									1	
CO2	2	1	1		1								1	
CO3	2	1	1	1									1	
CO4	1	1	1										1	
CO4	1	1	1										1	
AVERAGE	1.6	1	1	1	1								1	

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VI

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Communication Laboratory
Course Code   : 18ECL67

Cos	Statements
C605.1	Design and test circuits for analog modulation and demodulation schemes viz., AM, FM, etc.
C605.2	Determine the characteristics and response of microwave waveguide
C605.3	Determine characteristics of micros trip antennas and devices & compute the parameters associated with it
C605.4	Designandtestthedigitalandanalogmodulationcircuitsanddisplaythewaveforms.
C605.5	Simulate the digital modulation systems and compare the error performance of basic digital modulation schemes

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1									2	
CO2	1	1											1	
CO3	1	1											1	
CO4	1	1	1										1	
CO5	1	1		1									1	
AVERAGE	1.2	1	1	1									1	

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VIII

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Wireless and Cellular Communication
Course Code   : 18EC81

Cos	Statements
C805.1	UnderstandtheCommunicationtheorybothPhysicalandnetwork¬ingassociatedwithGSM, CDMA&LTE4Gsystems
C805.2	Explain concepts of propagation mechanisms like Reflection, Dif¬fraction ,Scattering in wireless channels
C805.3	Develop a scheme for idle mode, call setup, call progress and handling and call tear down in a GSM cellular network
C805.4	Develop a scheme for idle mode, call setup, call progress handling and call tear down in a CDMA cellular network
C805.5	Understand the Basic operations of AirinterfaceinaLTE4Gsystem.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1										1	
CO2	2	1	1	1	1								1	
CO3	1	1	1	1									1	
CO4	2	1	1		1								1	
CO5	2	1	1	1									1	1
AVERAGE	1.8	1	1	1	0.4								1	1

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VIII

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Network Security

Course Code   : 18EC82

Cos	Statements
C805.1	Explain network security services and mechanisms and explain security concepts
C805.2	Understand the concept of Transport Level Security and Secure Socket Layer
C805.3	Explain Security concerns in Internet Protocol security
C805.4	Explain Intruders, Intrusion detection and Malicious Software
C806.5	DescribeFirewalls,FirewallCharacteristics,BiasingandConfiguration

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1		1							1	1
CO2	2	1	1										1	1
CO3	1	1	1										1	1
CO4	2	1	1										1	1
CO5	2	1	1										1	1
AVERAGE	1.8	1	1	1		1							1	1

_____

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

EVEN SEMESTER-IV

Course Name: Complex Analysis, Probability and Statistical Methods   **CourseCode:18MAT41/C401**

Cos	Statements
C401.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C401.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C401.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
C401.4	Apply greedy and input enhancement methods to solve graph & string based computational problems.
C401.5	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C401.6	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	1
CO2	2	2	1	1	1				2	1		2	1	1	3
CO3	3	3	3	1	1					1		2	2	2	2
CO4	3	3	3	3	1	1		1	1	3		2	3	1	1
CO5	2	3	3	1	2					1		3	2	1	2
AVG	2.6	2.4	2.2	1.4	1.2	1	0	1	1.5	1.5	0	2	1.8	1.2	1.8

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

EVEN SEMESTER-IV

CourseName: Design and Analysis of Algorithms   **CourseCode:18CS42/C402**

Cos	Statements
C402.1	Describe computational solution to well known problems like searching, sorting etc.
C402.2	Estimate the computational complexity of different algorithms.
C402.3	Devise an algorithm using appropriate design strategies for problem solving.
C402.4	Apply appropriate method to solve a given problem.
C402.5	Describe various methods of algorithm analysis.

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	3	1								1	1	1
CO2	2	2	1	2	1								1	1	3
CO3	3	3	3	3	1								2	2	2
CO4	3	3	3	2	1								3	1	1
CO5	2	3	3	3	2								2	1	2
AVG	2.6	2.4	2.2	2.6	1.2	0	0	0	0	0	0	0	1.8	1.2	1.8

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

EVEN SEMESTER-IV

CourseName:Operating Systems   Course Code:18CS43/C403

Cos	Statements
C403.1	Demonstrate need for OS and different types of OS
C403.2	Apply suitable techniques for management of different resources
C403.3	Use processor, memory, storage and file system commands
C403.4	Analyse various normalization forms for the given application.
C403.5	Realize the different concepts of OS in platform of usage through case studies

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1	1							1	2	1
CO2	3	1	1	1								2	2	1	2
CO3	3	3	3	3	1								3	3	3
CO4	1	3	3	1	1								2	2	2
CO5	3	3	3	1	3	3						1	3	3	3
AVG	2.6	2.2	2.2	1.4	1.5	2	0	0	0	0	0	1.5	2.2	2.2	2.2

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

EVEN SEMESTER-IV

CourseName: Microcontroller and Embedded Systems **Course Code18CS44/C404**

Cos	Statements
C404.1	Describe the architectural features and instructions of ARM microcontroller
C404.2	Apply the knowledge gained for Programming ARM for different applications.
C404.3	Interface external devices and I/O with ARM microcontroller. Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C404.4	Develop the hardware /software co-design and firmware design approaches.
C404.6	Demonstrate the need of real time operating system for embedded system applications

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1									1	1	1
CO2	1	1	1	1								2	1	1	2
CO3	2	2	3	2	2						1	1	2	2	2
CO4	2	2	1	2							1	1	2	2	2
CO5	2	2	2	1										1	1
AVG	1.6	1.6	1.6	1.4	2	0	0	0	0	0	1	1.3	1.5	1.4	1.6

_____

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

EVEN SEMESTER-IV

CourseName: Object Oriented Concepts   **Course Code18CS45/C405**

Cos	Statements
C405.1	Explain the object-oriented concepts and JAVA.
C405.2	Develop computer programs to solve real world problems in Java.
C405.3	Set up Java JDK environment to create, debug and run simple Java programs .
C405.4	Create multi-threaded programs and event handling mechanisms.
C405.5	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swings.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	1								3	1	1	3
CO2	1	1	2	1								2	1	2	2
CO3	1	1	2	1								2	1	1	2
CO4	1	1	1	1								2	1	2	1
CO5	1	1	1	2								3	1	2	3
AVG	1	1	1.6	1.2	0	0	0	0	0	0	0	2.4	1	1.6	2.2

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

EVEN SEMESTER-IV

CourseName:Data Communication   **Course Code18CS46/C406**

Cos	Statements
C406.1	Explain the various components of data communication.
C406.2	Explain the fundamentals of digital communication and switching.
C406.3	Compare and contrast data link layer protocols.
C406.4	Demonstrate Medium Access Control protocols for reliable and noisy channels.
C406.5	Summarize IEEE 802.xx standards .

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1					1			1	3	1	1	3
CO2	3	1	1					1		1	1	2	1	2	2
CO3	3	2	1					1		1		2	1	1	2
CO4	3	1	1							1		2	1	2	1
CO5	2	1	1					1				3	1	2	3
AVG	1.8	1.2	1	0	0	0	2.8	1	0	1	1	2.4	1	1.6	2.2

_____

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

EVEN SEMESTER-IV

CourseName: Design and Analysis of Algorithm Laboratory   **Course Code18CSL47/C407**

Cos	Statements
C407.1	Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
C407.2	Implement a variety of algorithms such assorting, graph related, combinatorial, etc., in a high level language.
C407.3	Analyze and compare the performance of algorithms using language features.
C407.4	Measure and compare the performance of different algorithms.
C407.5	Apply and implement learned algorithm design techniques and data structuresto solve real-world problems.

_____

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

EVEN SEMESTER-IV

CourseName: Microcontroller and Embedded Systems Laboratory   Course Code18CSL48/C408

Cos	Statements
C408.1	Develop and test program using ARM7TDMI/LPC2148
C408.2	Conduct the following experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.

Department of Mechanical Engineering
ACADEMIC YEAR 2021-22
Course Outcomes

Subject: APPLIED THERMODYNAMICS		Subject Code:18ME42
Course Outcomes		
CO1	Apply thermodynamic concepts to analyze the performance of gas power cycles.	
CO2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.	
CO3	Understand combustion of fuels and performance of I C engines.	
CO4	Apply Thermodynamic concepts to determine performance parameters of refrigeration and air-conditioning systems.	
CO5	Understand the working principle of Air compressors and Steam nozzles, applications, relevance of air and identify methods for performance improvement	

Subject: FLUID MECHANICS		Subject Code:18ME43
Course Outcomes		
CO1	Identify and calculate the key fluid properties used in the analysis of fluid behavior. Explain the principles of pressure, buoyancy and floatation	
CO2	Apply the knowledge of fluid statics, kinematics and dynamics while addressing problems mechanical and chemical engineering.	
CO3	Describe the principles of fluid kinematics and dynamics.	
CO4	Explain the concept of boundary layer in fluid flow and apply dimensional analysis to for dimensionless numbers in terms of input output variables.	
CO5	Illustrate and explain the basic concept of compressible flow and CFD	

Subject: KINEMATICS OF MACHINES		Subject Code:18ME44
Course Outcomes		
CO1	Identify the kinematic link, kinematic pairs, chains, mechanisms, mobility, and inversions.	
CO2	Determine the velocities and accelerations of linkages and joints of mechanisms graphical method.	
CO3	Apply the Freudenstein's equation to determine the velocities and accelerations by analytical method for slider crank mechanism and other applications.	
CO4	Analyse different cams and sketch the cam profiles for various motions of the follower, motion characteristics.	
CO5	Evaluate the velocity ratio and torque in various types of gear trains.	

Subject: METAL CASTING AND WELDING		Subject Code:18ME45B
Course Outcomes		
CO1	Describe the casting process and prepare different types of cast products.	
CO2	Compare the Gas fired pit, Resistance, Coreless, Electrical and Cupola Metal Furnaces.	
CO3	Understand the Solidification process and Casting of Non-Ferrous Metals	
CO4	Describe the Metal Arc, TIG, MIG, Submerged and Atomic Hydrogen Welding processes etc. used in manufacturing	
CO5	Describe methods for the quality assurance of components made of casting and joining process	

Subject: MECHANICAL MEASUREMENTS AND METROLOGY		Subject Code:18ME46B
Course Outcomes		
CO1	Understand the objectives of metrology, methods of measurement, standards of measurement & various measurement parameters	
CO2	Understand limits, fits and tolerance and the working of comparators	
CO3	Describe measurement of major & minor diameter, pitch, angle and effective diameter of screw threads and gears	
CO4	Explain measurement systems, transducers, intermediate modifying devices and terminating devices	
CO5	Understand the measurement of force, Torque and Pressure	

Subject: MECHANICAL MEASUREMENTS AND METROLOGY LAB		Subject Code:18MEL47B
Course Outcomes		
CO1	Understand the Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometer	
CO2	Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set	
CO3	Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats and mechanical comparator	
CO4	Determine the screw thread parameters using gear tooth profile using gear tooth Vernier/Gear tooth micrometer	
CO5	Analyse tool forces using Lathe/Drill tool dynamometer	

Subject: FOUNDRY, FORGING AND WELDING LAB	**Subject Code:**18MEL48B
Course Outcomes	
CO1	Identify the properties of moulding sand (Tension,compression,shear&permeability)
CO2	Build sand moulds using hand tools ,patterns and cores
CO3	Estimate the raw material required for change of cross s ection and dimensions.
CO4	Demonostrate the forging operations

Subject: FINITE ELEMENT METHODS		Subject Code:18ME61
Course Outcomes		
CO1	Identify the application and characteristics of FEA elements such as bars, beams, plane and iso-parametric elements.	
CO2	Develop element characteristic equation and generation of global equation.	
CO3	Formulate and solve Axi-symmetric and heat transfer problems	
CO4	Apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts, heat transfer, fluid flow, axi-symmetric and dynamic problems	
CO5	Solve for field variables in heat transfer , fluid flow problems, axi-symmetric and dynamic problems	

Subject: DESIGN OF MACHINE ELEMENTS II		Subject Code:18ME62
Course Outcomes		
CO1	Apply design principles for the design of mechanical system involving springs, belts, pulleys and wire ropes	
CO2	Design different types of gears and simple gear boxes for relevant applications	
CO3	Understand the design principles of brakes and clutches	
CO4	Apply design concepts of hydrodynamics bearings for different applications and select anti friction bearings for different applications using the manufacturers, catalogue	
CO5	Apply the engineering design tools to product design	

Subject: Heat transfer		Subject Code:18ME63
Course Outcomes		
CO1	Understand the modes of heat transfer and apply the basic laws to formulate engineering systems.	
CO2	Understand and apply the basic laws of heat transfer to extended surface, composite material and unsteady state heat transfer problems	
CO3	Analyze heat conduction through numerical methods and apply the fundamental principle to solve radiation heat transfer problems.	
CO4	Analyze heat transfer due to free and forced convective heat transfer.	
CO5	Understand the design and performance analysis of heat exchangers and their practical applications, Condensation and Boiling phenomena	

Subject: NON-TRADITIONAL MACHINING		Subject Code:18ME641
Course Outcomes		
CO1	Understand the compare traditional and non-traditional machining process and recognize the need for Non- traditional machining process.	
CO2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM	
CO3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations.	
CO4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM.	
CO5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM	

Subject: NON-CONVENTIONAL ENERGY SOURCES	**Subject Code:**18ME651
Course Outcomes	
CO1	To introduce the concepts of solar energy, its radiation, collection, storage and application.
CO2	To introduce the concepts and applications of Wind energy, Biomass energy, Geothermal energy and Ocean energy as alternative energy sources.
CO3	To explore society's present needs and future energy demands
CO4	To examine energy sources and conversion of energy including non-renewable ,renewable energy sources into useful energy .
CO5	To get exposed to energy conservation methods

Subject: COMPUTER AIDED MODELLING AND ANALYSIS LAB	**Subject Code:**18MEL66
Course Outcomes	
CO1	Analyze the structural members like bars, trusses, and beams for different loads.
CO2	Determine the stresses in plates under plane stress conditions.
CO3	Solve for temperature distribution in 1D and 2D members under conduction and convection heat transfer.
CO4	Analyze bars and beams for dynamic response

Subject: HEAT TRANSFER LAB	**Subject Code:**18MEL67
Course Outcomes	
CO1	Perform experiments to determine the thermal conductivity of a metal rod and emissivity of a test plate
CO2	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin
CO3	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values
CO4	Determine Boiling of Liquid and Condensation of Vapour and Estimate the performance of a refrigerator
CO5	Calculate temperature distribution of study and transient heat conduction through a plane wall, cylinder and fin

Subject: MINI-PROJECT	**Subject Code:**18MEMP68
Course Outcomes	
CO1	Practice acquired knowledge within the chosen area of technology for project development.
CO2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
CO3	Reproduce, improve and refine technical aspects for engineering projects by applying the knowledge of design/solve complex engineering problems by the usage of modern tools.
CO4	Work as an individual or in a team in development of technical projects.
CO5	Communicate and report effectively project related activities and findings.

Subject: ENERGY ENGINEERING		Subject Code:18ME81
Course Outcomes		
CO1	Understand the construction and working of steam generators and their accessories.	
CO2	Identify renewable energy sources and their utilization	
CO3	Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, nuclear, hydel and tidal.	

Subject: TRIBOLOGY		Subject Code:18ME822
Course Outcomes		
CO1	Understand the fundamentals of tribology and associated parameters	
CO2	Apply concepts of tribology for the performance analysis and design of components experiencing relative motion	
CO3	Analyse the requirements and design hydrodynamic journal and plane slider bearings for a given application	
CO4	Select proper bearing materials and lubricants for a given tribological application	
CO5	Apply the principles of surface engineering for different applications of tribology	

Department of Basic Science

2.6.1 QlM Programme Outcomes (POs) and Course Outcomes (COs) offered by the department (EVEN and ODD) ACY 2021-2022

I YEAR COURSES

Sl. No	Course Name	Course Code
1	Calculus and Differential Equations	21MAT11
2	Engineering Physics	21PHY12/22
3	Basic Electrical Engineering	21ELE13/21ELE23
4	Engineering Visualization	21EVN15/25
5	Engineering Physics Laboratory	21PHYL16/26
6	Basic Electrical Engineering Laboratory	21ELE17/27
7	Communicative English	21EGH18
8	Innovation and Design Thinking	21ITD19
9	Engineering Chemistry	21CHE12/22
10	Problem-Solving Through Programming	21PSP23/13
11	Basic Electronics & Communication Engineering	21ELN14/24
12	Elements of Mechanical Engineering	21EME15/25
13	Engineering Chemistry Laboratory	21CHEL16/26
14	Computer Programming Laboratory	21CPL27/17
15	Scientific Foundations of Health	21SFH19/29
16	Professional Writing Skills in English	21EGH28
17	Advanced Calculus and Numerical Methods	21MAT21

HOD

DEPARTMENT OF BASIC SCIENCE

ACADEMIC YEAR 2021-22

COURSE OUTCOMES OF I YEAR

Course Name: CALCULUS AND DIFFERENTIAL EQUATIONS
Course Code: 21MAT11[C101]

COs	STATEMENT
C101.1	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.
C101.2	Learn the notion of partial differentiation to calculate rate of change of multivariate functions and solve problems related to composite functions and Jacobian.
C101.3	Solve first-order linear/nonlinear ordinary differential equations analytically using standard methods
C101.4	Demonstrate various models through higher order differential equations and solve such linear ordinary differential equations.
C101.5	Test the consistency of a system of linear equations and to solve them by direct and iterative methods.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C101.1	3	2											3	1	
C101.2	3	2											3		
C101.3	3	2											3	1	
C101.4	3	2											3		
C101.5	3	2											3		

_____

Course Name: Engineering Physics
Course Code: 21PHY12/22 [C102]

COs	STATEMENT
C102.1	Interpret the types of mechanical vibrations and their applications, the role of Shock waves in various fields.
C102.2	Demonstrate the quantization of energy for microscopic system.
C102.3	Apply LASER and Optical fibers in opto electronic system.
C102.4	Illustrate merits of quantum free electron theory and applications of Hall effect.
C102.5	Analyze the importance of XRD and Electron Microscopy in Nano material characterization

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C102.1	2	2											2		
C102.2	2	2											2		
C102.3	2	2											3		
C102.4	2	2											1		
C102.5	2	2											1		

Course Name: BASIC ELECTRICAL ENGINEERING
Course Code: 21ELE13/21ELE23 [C103]

COs	STATEMENT
C103.1	Analyze basic DC and AC electric circuits.
C103.2	Explain the working principles of transformers and electrical machines.
C103.3	Explain the concepts of electric power transmission and distribution of power.
C103.4	Understand the wiring methods, electricity billing, and working principles of circuit protective devices and personal safety measures.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C103.1	3	3											3		
C103.2	3	3											3		
C103.3	3					2							3		
C103.4	3					2		2					3	1	

Course Name: Engineering Visualization
Course Code: 21EVN15/25 [C104]

COs	STATEMENT
C104.1	Understand and visualize the objects with definite shape and dimensions
C104.2	Analyze the shape and size of objects through different views
C104.3	Develop the lateral surfaces of the object
C104.4	Create a 3D view using CAD software.
C104.5	Identify the interdisciplinary engineering components or systems through its graphical representation.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C104.1	3	3			3							1	2	3	
C104.2	3	3			3							1	2	3	
C104.3	3	3			3							1	2	3	
C104.4	3	3			3							1	2	3	
C104.5	3	3			3							1	2	3	

Course Name: ENGINEERING PHYSICS LABORATORY
Course Code: 21PHYL16/26 [C105]

COs	STATEMENT
C105.1	Understand the measuring techniques
C105.2	Operate different instruments and be capable to analyze the experimental results.
C105.3	Construct the circuits and their analysis.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C105.1	3			3											
C105.2	3			3									1		
C105.3	3			3											

Course Name: BASIC ELECTRICAL ENGINEERING LABORATORY
Course Code: 21ELE17/27 [C106]

COs	STATEMENT
C106.1	Verify KCL and KVL and maximum power transfer theorem for DC circuits.
C106.2	Compare power factors of different types of lamps.
C106.3	Demonstrate the measurement of the impedance of an electrical circuit and power consumed by a 3-phase load.
C106.4	Analyze two-way and three-way control of lamps.
C106.5	Explain the effects of open and short circuits in simple circuits.
C106.6	Interpret the suitability of earth resistance measured.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C106.1	2	2				1				1			3		
C106.2	2	2				1				1			1		
C106.3	2	1				1				1			1		
C106.4	2	2				1				1					
C106.5	2					1	1	1		1					

Course Name: Communicative English

Course Code: 21EGH18 [C107]

COs	STATEMENT
C107.1	Understand and apply the Fundamentals of Communication Skills in their communication skills.
C107.2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
C107.3	To impart basic English grammar and essentials of language skills as per present requirement.
C107.4	Understand and use all types of English vocabulary and language proficiency.
C107.5	Adopt the Techniques of Information Transfer through presentation.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C107.1										2		2			
C107.2										1		1			
C107.3										2		1			
C107.4										1		2			
C107.5										3		3			1

Course Name: INNOVATION AND DESIGN THINKING

Course Code: 21IDT19 [C108]

COs	STATEMENT
C108.1	Appreciate various design process procedure
C108.2	Generate and develop design ideas through different technique
C108.3	Identify the significance of reverse Engineering to Understand products
C108.4	Draw technical drawing for design ideas

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C108.1	3														
C108.2	3														
C108.3	3														
C108.4	3														1

_____

Course Name: ENGINEERING CHEMISTRY

Course Code: 21CHE12/22 [C109]

COs	STATEMENT
C109.1	Discuss the electrochemical energy systems such as electrodes and batteries.
C109.2	Explain the fundamental concepts of corrosion, its control and surface modification methods namely electroplating and electroless plating
C109.3	Enumerate the importance, synthesis and applications of polymers. Understand properties and application of nanomaterials.
C109.4	Describe the principles of green chemistry, understand properties and application alternative fuels.
C109.5	Illustrate the fundamental principles of water chemistry, applications of volumetric and analytical instrumentation

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C109.1	3	1			1	1									
C109.2	3	2				1						1			
C109.3	3					1							2		
C109.4	3					2	1					1	1		
C109.5	3					2								1	

_____

Course Name: PROBLEM-SOLVING THROUGH PROGRAMMING
Course Code: 21PSP23/13 [C110]

COs	STATEMENT
C110.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
C110.2	Apply programming constructs of C language to solve the real-world problem
C110.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C110.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
C110.5	Design and Develop Solutions to problems using modular programming constructs using functions

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C110.1	3	2	2										3		
C110.2	3	3	2	3									3		
C110.3	2	3	3	2	2								3	1	
C110.4	2	3	3	2									3	1	
C110.5	3	2	2	2									3	2	

Course Name: **BASIC ELECTRONICS & COMMUNICATION ENGINEERING**
Course Code: **21ELN14/24 [C111]**

COs	STATEMENT
C111.1	Describe the concepts of electronic circuits encompassing power supplies, amplifiers and oscillators.
C111.2	Present the basics of digital logic engineering including data representation, circuits and the microcontroller system with associated sensors and actuators.
C111.3	Discuss the characteristics and technological advances of embedded systems.
C111.4	Relate to the fundamentals of communication engineering spanning from the frequency spectrum to the various circuits involved including antennas.
C111.5	Explain the different modes of communications from wired to wireless and the computing involve

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C111.1	3	1											1		
C110.2	3	1											2		
C110.3	3	1											2		
C110.4	3	1											3		
C110.5	3	1											1		

_____

Course Name: ELEMENTS OF MECHANICAL ENGINEERING

Course Code: 21EME15/25 [C112]

COs	STATEMENT
C112.1	Understand basic concepts of mechanical engineering in the fields of energy and its utilization, materials technology, manufacturing techniques, and transmission systems through demonstrations.
C112.2	Understand the application of energy sources in Power generation and utilization, Engineering materials, manufacturing, and machining techniques leading to the latest advancements and transmission systems in day to day activities
C112.3	Apply the skills in developing simple mechanical elements and processes

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C112.1	3						1						2		
C112.2	3						1						2		
C112.3	2				1								2	3	

Course Name: ENGINEERING CHEMISTRY LABORATORY
Course Code: 21CHEL16/26 [C113]

COs	STATEMENT
C113.1	Determine the pKa and coefficient of Viscosity of a given organic liquid
C113.2	Estimate the amount of substance present in the given solution using Potentiometer Conductometric and Colorimetric.
C113.3	Determine the total hardness and chemical oxygen demand in the given solution by volumetric analysis method
C113.4	Estimate the percentage of Nickel, copper and Iron in the given analyte solution by titration method.
C113.5	Demonstrate flame photometric estimation of sodium & potassium and the synthesis of nanomaterials by Precipitation method.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C113.1	3	1													
C113.2	3	1											1		
C113.3	3	1					1								
C113.4	3	1													
C113.5	3	1											1		

Course Name: COMPUTER PROGRAMMING LABORATORY
Course Code: 21CPL27/17 [C114]

COs	STATEMENT
C114.1	Define the problem statement and identify the need for computer programming
C114.2	Make use of C compiler, IDE for programming, identify and correct the syntax and syntactic errors in programming
C114.3	Develop algorithm, flowchart and write programs to solve the given problem
C114.4	Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving.
C114.5	Document the inference and observations made from the implementation

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C114.1	3	2	2										2		
C114.2	3	3	2										3		
C114.3	3	3	3										2		
C114.4	3	3	3	1									2	2	
C114.5	1														

Course Name: Scientific Foundations of Health
Course Code: 21SFH19/29 [C115]

COs	STATEMENT
C115.1	To understand Health and wellness (and its Beliefs)
C115.2	To acquire Good Health & It's balance for positive mindset
C115.3	To inculcate and develop the healthy lifestyle habits for good health
C115.4	To Create of Healthy and caring relationships to meet the requirements of MNC and LPG world
C115.5	To adopt the innovative & positive methods to avoid risks from harmful habits in their campus & outside the campus.
C115.6	To positively fight against harmful diseases for good health through positive mindset.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C115.1						1		1	1	1		1			
C115.2						1		1	1	1		1		1	
C115.3						1		1	1	1		1			
C115.4						1		1	1	1		1			
C115.5						1		1	1	1		1	1		
C115.6								1	1	1		1			

_____

Course Name: Professional Writing Skills in English
Course Code: 21EGH28 [C201]

COs	STATEMENT
C201.1	To understand and identify the Common Errors in Writing and Speaking.
C201.2	To Achieve better Technical writing and Presentation skills.
C201.3	To read Technical proposals properly and make them to Write good technical reports.
C201.4	Acquire Employment and Workplace communication skills.
C201.5	To learn about Techniques of Information Transfer through presentation in different level.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C201.1										2		2			
C201.2										2		2			
C201.3										2		2		1	
C201.4										2		2			1
C201.5										2		2			

_____

Course Name: ADVANCED CALCULUS AND NUMERICAL METHODS
Course Code: 21MAT21 [C202]

COs	STATEMENT
C202.1	Apply the concept of change of order of integration and change of variables to evaluate multiple integrals and their usage in computing the area and volume.
C202.2	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the inter dependence of line, surface and volume integrals.
C202.3	Formulate physical problems to partial differential equations and to obtain solution for standard practical PDE's
C202.4	Apply the knowledge of numerical methods in modelling of various physical and engineering phenomena
C202.5	Solve first order ordinary differential equations arising in engineering problems.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C202.1	3	2													
C202.2	3	2													
C202.3	3	2											2		
C202.4	3	2											2	2	
C202.5	3	2											2	2	