("2", "1" and "blank" indicate strong (above40%) moderate (below 40%) and no correlation respectively.)

Program Outcomes (POs):B. Tech-Chemical Engineering: I, II, III & IV years

B. Tech I Semester I

Subject Name:- Engineering Physics ; Subject Code:- KAS101T

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. To solve the classical and wave mechanics problems.	1	2	1	2		1						1
CO2. To develop the understanding of laws of thermodynamics and their application in various processes.2	2	1	1	1	2	1						
CO3. To formulate and solve the engineering problems on Electromagnetism & Electromagnetic Field Theory.	2	1				1						
CO4. To aware of limits of classical physics & to apply the ideas in solving the problems in their parent streams.	2	2		2				1		1		

Subject Name:- Engineering Mathematics-I; Subject Code:- KAS103T

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Remember the concept of matrices and apply for solving linear Simultaneous equations.	2	2	2	2	2	2	2		2	1	2	2
CO2. Understand the concept of limit , continuity and differentiability and apply in the study of Rolle,s , Lagrange,s and Cauchy mean value theorem and Leibnitz theorems.	2	2	1	2	1		1					2
CO3. Identify the application of partial differentiation and apply for evaluating maxima, minima, series and Jacobians.	2	2	2	2	1		1				2	2
CO4. Illustrate the working methods of multiple integral and apply for finding area, volume, centre of mass and centre of gravity.	2	2	1	1		1	1				2	2
CO5. Remember the concept of vector and apply for directional derivatives, tangent and normal planes. Also evaluate line, surface and volume integrals.	2	2		2		2					2	2

Subject Name:- Basic Electrical Engineering; Subject Code:- KEE101T												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Apply the concepts of KVL/KCL and network theorems in solving DC circuits.	2	2	2			1						2
CO2. Analyze the steady state behavior of single phase and three phase AC electrical circuits.	2	2	2									
CO3. Identify the application areas of a single phase two winding transformer as well as an auto transformer and calculate their efficiency. Also identify the connections of a three phase transformer.	2	1		2	1							2
CO4. Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications.	2	1	2			1						
CO5. Describe the components of low voltage electrical installations and perform elementary calculations for energy consumption.	2	1		2								1
Subject Name:- Programming for Problem Solving; Subject Code:- KCS101T												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. To develop simple algorithms for arithmetic and logical problems.	2	2	2						2		1	2
CO2. To translate the algorithms to programs & execution (in C language).	2	2	2						2		1	2
CO3. To implement conditional branching, iteration and recursion.	2	2	2						2			
CO4. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.	2	2	2						2			
CO5. To use arrays, pointers and structures to develop algorithms and programs.	2	2	2						2			2

Subject Name:- Engineering Physics Lab; Subject Code:- KAS151P												
Courese Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**

CO1. To determine the wavelength of sodium light by Newton‟s ring experiment.	1	2	1	2		1				1		1
CO2. To determine the wavelength of sodium light with the help of Fresnel‟s bi-prism.	2	1	1	1	2	1			1			
CO3. To determine the variation of magnetic field with the distance along the axis of a current carrying coil and estimate the radius of the coil.	2	1				1						
CO4. To draw hysteresis (B-H curve) of a specimen in the form of a transformer and to determine its hysteresis loss.	2	2		2				1		1		

Subject Name:- Basic Electrical Engineering Lab; Subject Code:- KEE151P												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Conduct experiments illustrating the application of KVL/KCL and network theorems to DC electrical circuits.	1	2	2			1		1				2
CO2. Demonstrate the behavior of AC circuits connected to single phase AC supply and measure power in single phase as well as three phase electrical circuits.	2	2	1				1					
CO3. Perform experiment illustrating BH curve of magnetic materials.	2	1		2	1							2
CO4. Calculate efficiency of a single phase transformer and DC machine.	2	1	2			1						
CO5. Perform experiments on speed measurement and reversal of direction of three phase induction motor and Identify the type of DC and AC machines based on their construction.	2	1		2				1				1

Subject Name:- Programming for Problem Solving Lab; Subject Code:- KCS151P												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.	2	2	2	1	2	1			2			2
CO2. Demonstrate an understanding of computer programming language concepts.	2	2	2		2				2			2

CO3. Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.	2	2	2	1	2	1			2			2
CO4. Able to define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures.	2	2	2	2	2				2			2
CO5. Develop confidence for self education and ability for life-long learning needed for Computer language.	2	2	2					2	2		1	2

Subject Name:- Engineering Graphics and Design Lab ; Subject Code:- KCE151P

Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Understanding of the visual aspects of engineering design.	2				2	1				2		1
CO2. Understanding of engineering graphics standards and solid modeling.	2	2			1							
CO3. Effective communication through graphics.	2	2			1					2		
CO4. Applying modern engineering tools necessary for engineering practice.	2	2			2							
CO5. Appling computer-aided geometric design.	2	2	2							2		
CO6. Analysis of Isometric views.	2	2								2		1
CO7. Creating working drawings.	2		2							2		2

Subject Name:- AI For Engineering ; Subject Code:- KMC101

Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Understand the evolution and various approaches of AI.	2	2	2	2	1						1	2
CO2. Understand data storage, processing, visualization, and its use in regression, clustering etc.	2		1		2					2	1	
CO3. Understand natural language processing and chatbots.	2	2	2									1
CO4. Understand the concepts of neural networks.	2		1		2					1		

CO5. Understand the concepts of face, object, speech recognition and Robots.	2	2										1

Subject Name:- Soft Skills-I ; Subject Code:- KNC101												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Students will be enabled to understand the correct usage of grammar.	2	2	2	2	1						2	2
CO2. Students will apply the fundamental inputs of communication skills in making speech delivery, individual conference, and group communication.	2		1		2		1			2	1	
CO3. Students will evaluate the impact of interpersonal communication on their performance as a professional and in obtaining professional excellence at the workplace.	2	2	2				2					1
CO4. Skills and techniques of persuasion and negotiation would enhance the level of students at multifarious administrative and managerial platforms.	2		1		2					1		
CO5. Student will be able to equip with basics of communication skills and will apply it for practical and oral purposes by being honed up in presentation skills and voice-dynamics.	2	2					2					1

B. Tech I Semester II												
Subject Name:- Engineering Chemistry ; Subject Code:- KAS202T												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Use of different analytical instruments.	2	2		2	2	2	2	2		2	1	2
CO2. Measure molecular/ system properties such as surface tension, viscosity, conductance of solution, chloride and iron content in water.	2	1	1					2	2		1	2
CO3. Measure hardness of water.	2	2	2	2	2	2		1	2	2	2	2

CO4. Estimate the rate constant of reaction.	2	1	2	2				2		1	1	1

Subject Name:- Engineering Mathematics-II ; Subject Code:- KAS203T												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. The effective mathematical tools for the solutions of differential equations that model physical processes.	2	2	2	2	2	2	2		2	2	2	2
CO2. To apply integral calculus in various field of engineering. Apart from some other applications students will have a basic understanding of Beta and Gamma functions.	2	2	2								2	2
CO3. The tool of Fourier series for learning advanced Engineering Mathematics.	2	2	2								2	2
CO4. The tools of differentiation of functions of complex variables that are used in various techniques dealing with engineering problems.	2	2	2		2						2	2
CO5. The tools of integration of functions of complex variables that are used in various techniques dealing with engineering problems.	2	2	2		2						2	2

Subject Name:- Emerging Domain in Electronics Engineering ; Subject Code:- KEC201T												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Understand the concept of PN Junction and devices	2	2	1									
CO2. Understand the concept of BJT, FET and MOFET.	2	2										
CO3. Understand the concept of Operational amplifier	2	2	2						1			
CO4. Understand the concept of measurement instrument.	2	2			1							
CO5. Understand the working principle of different type of sensor and their uses.	2	2										
CO6. Understand the concept of IoT system & Understand the component of IoT system.	2	2			2					2		

Subject Name:- Fundamentals of Mechanical Engineering and Mechatronics; Subject Code:- KME201T												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Understand the concept of stress and strain, factor of safety, beams.	2	2		2		2				2		1
CO2. Understand the basic component and working of internal combustion engines, electric and hybrid vehicles, refrigerator and heat pump, air conditioning.	2	2		2	2	1	1		1			2
CO3. Understand fluid properties, conservation laws, hydraulic machinery used in real life.	2			2		2				2		1
CO4. Understand the working principle of different measuring instrument with the knowledge of accuracy, error and calibration, limit, fit, tolerance and control system.	2	2		2	2	2			1			2
CO5. Understand concept of mechatronics with their advantages, scope and Industrial application, the different types of mechanical actuation system, the different types of hydraulic and pneumatic systems.	2	2	2	2	1	2			1			1
CO6. Apply concepts of strength of material for safe design, refrigeration for calculation of COP, concepts of fluid mechanics in real life.	2	2	2			1				1		1
Subject Name:- Engineering Chemistry Lab ; Subject Code:- KAS252P												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Use of different analytical instruments.	2	2				2		1	2	2	2	2
CO2. Measure molecular/system properties such as surface tension, viscosity etc.	2		2		1	2		1	2			
CO3. Measure conductance of solution, chloride and iron content in water, hardness of water.	2		2		2	2		2			2	
CO4. Estimate the rate constant of reaction.	2	2	1		1	2	2	1	2		2	2
Subject Name:- Electronics Engineering Lab ; Subject Code:- KEC251P												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**

CO1. Distinguish between analog and digital systems.		2			1					1		
CO2. Identify the various digital ICs and understand their operation.		2		1			2		1			
CO3. Apply Boolean laws to simplify the digital circuits.		2		2								
CO4. Design simple logic circuits.		2					1				1	
Subject Name:- English Language Lab ; Subject Code:- KAS254P												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. To facilitate software based learning to provide the required English Language proficiency to students.		2		1			2	1				2
CO2. To acquaint students with specific dimensions of communication skills i.e. Reading,Writing, Listening, Thinking and Speaking.							2	1				2
CO3. To train students to use the correct and error-free writing by being well versed in rules of English grammar.		1		1			2					1
CO4. To cultivate relevant technical style of communication and presentation at their work place and also for academic uses.							1	1				2
CO5. To enable students to apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics.	1	2					1					2
Subject Name:- Mechanical Workshop Lab; Subject Code:- KWS251P												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Use various engineering materials, tools, machines and measuring equipments.	2			2	2							2
CO2. Perform machine operations in lathe and CNC machine.	2			2	2	1			2	1		
CO3. Perform manufacturing operations on components in fitting and carpentry shop.	2		2	2	2	1			2	2		1
CO4. Perform operations in welding, moulding, casting and gas cutting.	2		2	2	2	2						1
CO5. Fabricate a job by 3D printing manufacturing technique.	2	2	2	2		2			1	2	1	2
Subject Name:- Emerging Technology for Engineering ; Subject Code:- KMC202												

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Understand the concepts of internet of things, smart cities and industrial internet of things.	2	2				2				2	2	1
CO2. Understand the concepts of cloud computing.	2	2	2	2								
CO3. Understand the concepts of block chain, cryptocurrencies, smart contracts.												
CO4. Understand design principles, tools, trends in 3 D printing and drones.	2	2	2	2	2	2			2	2		1
CO5. Understand augmented reality (AR), virtual reality (VR), 5G technology, brain computer interface and human brain.	2	2	2	2	2				2	1	2	1

Subject Name:- Soft Skill II; Subject Code:- KNC201

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Students will be able to converse well with effective LSRW skills in English.	2	2		2	1						2	2
CO2. Students will evaluate the importance of conversation in their personal and professional domain and apply it for extending their professional frontiers.	2		1		2		1			2	1	
CO3. Students will learn to apply motivation skills for their individual and professional excellence.	2	2	2				2					1
CO4. Students will utilize their teamwork and their interpersonal communication skills to survive and excel at their work-place.			1		2					1		
CO5. Students will learn to evaluate creativity for their professional innovation and critical thinking for their competence.	2	2					2					1

B. Tech II Semester III

Subject Name:- Maths IV ; Subject Code:- KAS302

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO 1: The idea of Laplace transform of functions and their application	2	2	2	2	2	2	2		2			2

CO 2: The idea of Fourier transform of functions and their applications	2	2	2								1	2
CO 3: The basic ideas of logic and Group and uses.	2	2	2				1				1	2
CO 4: The idea s of sets, relation, function and counting techniques.	2	2	2		2						2	2
Subject Name:- Technical Communication; Subject Code:- KAS301												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO 1: To explain about technical writing needed for an engineer, technical style, barriers to communication & flow of communications Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers.	2	2		2	1						2	2
CO 2: Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.To explain about technical reports, technical research paper writing, Expert Technical Lecture,7 Cs of effective business writing: concreteness, completeness, clarity, conciseness, courtesy, correctness, consideration, C.V./Resume writing, Technical Proposal: Types, Structure & Draft.	2		1		2		1			2	1	
CO 3: Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.To explain about technical presentations in most effective ways i.e classroom presentations ,individual conferencing ,Public Speaking, Modes of presentations, Methods of presentations & Audience Participation	2	2	2				2					1
CO 4: Understand about Interview skills; Objectives of Group Discussion, Seminar/Conferences, hone & Improve his PresentationSkills, Argumentation skills ,Critical thinking ; effective businesscommunication competence: Grammatical; Discourse competence Strategic competence for Solution of communication			1		2					1		
CO 5 : Understand about Code and Content; Stimulus & Response; Encoding process; Decoding process; Pronunciation Etiquette; Syllables; Vowel sounds;	2	2					2					1

Consonant sounds; Tone: Rising tone; Falling Tone; Flow in Speaking; Professional Personality Attributes:Empathy; Considerateness; Leadership; Competence etc.It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.												

Subject Name:- Material And Energy Balance; Subject Code:- KCH 301

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Apply steady-state and unsteady state material and energy balance on a system.	2	1		1			1	2	2	1	1	1
CO2. Analyze all the stiochiometric and balances being applied on asystem undergoing	2	1		1		2	1	2	2	1	1	2
CO3. chemical process.	2	1		1		2	1	2	2	1	1	1
CO4. Design equipment with inlet and outlet; including recycle- bypass streams for a	2	1		1		2		2	2	1	1	2

Subject Name:- Fluid Chemical Engg. Fluid Mechanics; Subject Code:- KCH 302

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Understand the properties and flow of fluid.	2	1				1				1	2	2
CO2. Analyse the model and prototype.	2	1				1				1	2	2
CO3. Explain the factors influencing velocity profiles for laminar and turbulent flow.	2	1				1				1	2	2
CO4. Design the pumps and compressors for optimum operation.	2	1				1				1	2	2

Subject Name:- Heat Transfer Operations; Subject Code:- KCH 303

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. apply basic principles of heat transfer for designing heat transfer systems.	2	1				1				1	2	2
CO2. model heat transport systems and develop predictive correlation.	2	1				1				1	2	2
CO3. assess and evaluate various designs for heat transfers and optimize the solution	2	1				1				1	2	2

Subject Name:- Chemical Engg. Fluid Mechanics Lab; Subject Code:- KCH 351												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Calculate coefficient of discharge through v-notch, venturimeter, and orificemeter..	2	1	2	2			1		2		2	2
CO2. Determine friction losses through different pipes and fittings.	2	1	2	1			1		2		2	2
CO3. Calculate the efficiency of centrifugal pump.	2	1	2	2			1		1		2	2
CO4. Study different types of flow and analyse Bernoulli's law.	2	1	2	1			1		1		2	2
Subject Name:- Heat Transfer Operations Lab; Subject Code:- KCH 352												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Determine the thermal conductivity of different materials.	2	1	2	2			1		2		2	2
CO2. Calculate the rate of heat transfer through different types of heat ex-changers in different flow patterns.	2	1	2	1			1		2		2	2
CO3. Study the natural convection phenomena and temperature distribution in various setups(like composite wall, lagged pipe etc.).	2	1	2	2			1		1		2	2
Subject Name:- Soft Computing Lab; Subject Code:- KCH 353												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Understand the importance of software.	2	1	1			1	1		2		2	2
CO2. Solve basic chemical engineering problems using MS-EXCEL and MATLAB.	2	1	1			1	1		2		2	2
Subject Name:- Mini Project/ Seminar; Subject Code:- KCH 354												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. To develop presentation skills and enhance knowledge on various fields in chemical engineering through technical seminars	2					1	1		2	2	2	2
B. Tech II Semester IV												
Subject Name:- Mechanical Operations; Subject Code:- KCH 401												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**

CO1. Measure the particle size,	2	1		1		1	1				2	2
CO2. Estimate the crushing efficiency of different type's crushers.	2	2		1			1				2	2
CO3. Explain the particle sedimentation.	2	1		1			1				1	1
CO4. Design the storage area for the different types of solids	2	1		1		1	1				1	2
Subject Name:- Chemical Reaction Engineering-I; Subject Code:- KCH 402												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Identify the reaction type and their kinetics.	2	1		1		1	1	2	2	1	1	1
CO2. Design the reactor for the batch and continuous chemical process.	2	1		1		1	1	2	2	1	1	1
CO3. Understand the Ideal and Non – Ideal Reactors.	2	1		1		1	1	2	2	1	1	1
Subject Name:- Chemical Engg. Thermodynamics; Subject Code:- KCH 403												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Identify the thermodynamic property of the pure substance and mixture.	2	2		1		1	1		1		2	2
CO2. Know the basic principles of refrigeration and liquefaction process.	2	2				1	1		1		1	1
CO3. Understand the relation between thermodynamic and chemical reactions	2	2		1		1	1		1		1	1
Subject Name:- Mechanical Operations Lab; Subject Code:- KCH 451												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Measure the particle size.	2	1	2	1		1	2	2	1	1	1	2
CO2. Estimate the crushing efficiency of different type's crushers.	2	2	2	1		1	2	2	1	1	1	2
CO3. Calculate medium and filter resistance of filters.	2	1	2	1		1	2	2	1	1	1	1

CO4. Estimate the pressure drop in packed and fluidized bed	2	1	2	1		1	2	2	1	1	1	1
Subject Name:- Chemical Reaction Engg lab.; Subject Code:- KCH 452												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Analyse the reaction type and their kinetics.	2	2	2			2	1	2	2		1	2
CO2. Design the reactor for the batch and continuous chemical process Lab	2	1	2			2	1	2	2		1	2
Subject Name:- Numerical Methods Of Analysis Lab; Subject Code:- KCH 453												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Compare thecomputational methods for advantages and drawback,	**2**	**2**	**1**	**1**	**1**	**1**		**1**	**1**		**2**	**2**
CO2. Implement the computational methods using any ofexisting programming languages, test such methods and compare between them,	**2**	**2**	**1**	**1**	**1**						**1**	
CO3. Identify thesuitable computational technique for a specific type of problems and develop the computational method that is suitable for the underlying problem.	**2**	**2**	**2**	**1**	**1**				**1**			**2**
Subject Name:- Computer system Security; Subject Code:- KNC401												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats.	1			1		1			2	2	2	2
CO2. To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats.	1	1				2	2	2	1	1	1	
CO3. To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	1			1		1		2	2	1	1	1
CO4. To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios.				1		1		2	1	2	1	
CO5. To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	2	1		1		1		2	1	1	2	

B. Tech II Semester V

Subject Name:- MASS TRANSFER – I ; Subject Code:- KCH 501

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Understand the principles of molecular diffusion and basic laws of mass transfer	2	2		1		1	1			1	2	1
CO2. Utilize mass transfer concepts to design gas absorption systems.	2	2		1		1	1			1	2	1
CO3. Discuss the basics of humidification process and its application	2	2		1		1	1			1	2	2
CO4. Explain the concept and mechanism of drying operations.	2	2		1		1	1			1	2	2
CO5. Analyze the concept of crystallization process and identification of suitable crystallizer	2	2		1		1	1			1	2	2

Subject Name:- CHEMICAL REACTION ENGINEERING - II; Subject Code:- KCH 502

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Classify catalysts and predict physical properties of catalyst, surface area, void volume, solid density pore volume distribution.	2	1		1		1	1	2	2	1	1	1
CO2. Understand the nature and mechanism of catalytic reactions and predict the rate controlling step reactions.	2	1		1		1	1	2	2	1	1	1
CO3. Analyze the various contacting pattern for two phase system.	2	1		1		1	1	2	2	1	1	1
CO4. Predict the rate equation for heterogeneous reactions and understand the effect of velocity, particle size and fluid properties on rate of reactions controlled by mass transfer	2	1		1		1	1	2	2	1	1	1
CO5. Analyze the best kinetic regimes for mass transfer and reaction and predict the rate equation.	2	1		1		1	1	2	2	1	1	1
CO6. Understand the nature and mechanism of Biochemical reactions.	2	1		1		1	1	2	2	1	1	1
CO7. Understand the working of Biochemical and polymerization reactors.	2	1		1		1	1	2	2	1	1	1

Subject Name:- PROCESS DYNAMICS & CONTROL ; Subject Code:- KCH 503

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Demonstrate fundamental understanding of process control.	2	1		1		1		1	1			2
CO2. Develop transfer function (input-output) and models for linear dynamical processes.	2	1		1				1	1	1	1	2
CO3. Characterize the dynamics and stability of processes based on mathematical analysis.	2	1				1			1	1	1	2
CO4. Develop the mathematical model of various chemical processes.	2	2		1		1		1	1	1	1	
CO5. Explain different control modes and their application in controlling various processes.	2	1		1		1		1		1	1	2
CO6. Explain the working of different controllers and valves.	2	2		1		1		1		1	1	2
CO7. Demonstrate the working and application of SCADA and DCS.	2	1		1		1		1		1		

Subject Name:- Departmental Elective-I -OPTIMIZATION TECHNIQUES; Subject Code:- KCH052

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Understand the role of optimization in a chemical process plants.	2	2							1	1	2	2
CO2. Formulate mathematical models for optimization problems.	2	2							1		2	2
CO3. Analysis of degree of freedom and complexity of solutions to an optimization problem.	2	2							1	1	2	2
CO4. Understand and analyze the various methods used for unconstrained one dimensional search.	2	1							1		2	2

Subject Name:- Departmental Elective-II - PROCESS FLOW SHEET SIMULATION ; Subject Code:- KCH 056

Courese Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Synthesize a flowsheet for the process on paper and implement this in a simulation program.	2	1				1		1	1	1	2	2
CO2. Deal with ASPEN PLUS/HYSIS/PRO II/Design II/UniSim/OLI Pro/Aspen Custom Modeler/TK-Solver.	2	1	1		2	1		1	1	2	2	2
CO3. Use process flowsheet simulations to solve problems in the chemical industry.	2	1				1		1	1	1	2	2
CO4. Estimate the thermo-physical properties for the chemical species and	2				2				1	2	2	2

identify the correct models to use.												
CO5. Design a distillation column, feed height and number of trays in a column.	1		1					1	1		2	2
Subject Name:- MASS TRANSFER-1 LAB; Subject Code:- KCH 551												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Analyze the data on diffusion coefficient and mass transfer coefficient.	2	2	2			1	1		1		1	2
CO2. Study the characteristic of Packed bed absorption column	2	2	2			1	1		2		1	2
CO3. Discuss the working of a cooling tower and temperature drop in a fluid inside it.	2	2	2			1	1		2		1	2
CO4. Understand the working mechanism of crystallizer and dryer	2	2	2			1	1		2		1	2
Subject Name:- PROCESS DYNAMICS & CONTROL LAB ; Subject Code:- KCH 552												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Operate and handle the interacting and non-interacting systems in industries.	2	1	2	1		2	2	1	1		1	2
CO2. Understand the various input behaviours.	2	1	2	1		1	2	1	1		1	2
CO3. Understand the working of various valves in industries and understand the function of each small unit attached to it.	2	1	2	1		2	1	2	1		2	2
CO4. Select and operate different types of controllers used in industries.	2	1	2	1		1	1	1	1		1	2

Subject Name:- PROCESS MODELING & SIMULATION LAB; Subject Code:- KCH 553												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Analyze steady-state and unsteady state material and energy balance on a system.	2	2	2		2	1	1	2	2	1	1	2
CO2. Analyze physical and chemical phenomena involved in various chemical processes.	2	2	2		2	1	1	1	2	1	1	1
CO3. Develop mathematical models for various chemical engineering plant based processes.	2	2	2		2	1	1	2	2	1	1	1
CO4. Use various simulation approaches such as sequential, simultaneous, and equation oriented.	2	2	2		2	1	1	1	2	1	1	2

CO5. Simulate a chemical process using process simulators (ASPEN Plus/ ASPEN Hysys/ MATLAB/ PRO-II/ CHEMCAD/ FlowTran/ Fluent/ MATLAB etc..	2	2	2		2	1	1	2	2	1	1	1
Subject Name:- MINI PROJECT OR INTERNSHIP ASSESSMENT; Subject Code:- KCH 554												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Understand and workout the project problem	2					1	1		2	2	2	2
CO2. Gain experience to make a project report.	2					1	1		2	2	2	2
CO3. Acquire the necessary confidence to carry out main project in the final year.	2					1	1		2	2	2	2
Subject Name:- Constitution of India and Law; Subject Code:- KNC501												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Have general knowledge and legal literacy about Indian Constitution and thereby it helps to take up competitive examinations & to manage/face complex societal issues in society		2				1	2	2	2	2	1	1
CO2. To educate the students about their obligations, responsibilities, privileges and rights, duties and get insights on administrative and judicial setup of the country.		2				1	2	2	2	2	2	1
CO3. Inculcate national and patriotic spirit among the students as responsible citizens of the country.		2				1	2	2	2	2	2	1
CO4. To impart knowledge about state and central policies, fundamental duties, electoral process, amendment procedure and emergency provisions.		2				1	2	2	2	2	2	1
CO5. Impart the ethical values, responsibilities and obligations of the professional to the society and the nation. Educate the engineering students about the scope and aim of professional ethics, their responsibilities, virtues like honesty, integrity and reliability, the risk and liability in engineering profession.		2				1	1		2	1	2	1
B. Tech III Semester VI												
Subject Name:- MASS TRANSFER –II; Subject Code:- KCH 601												

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Understand the basics of distillation process for separation.	2	2		1		1	1			1	2	1
CO2. Analyze the distillation process for binary and multicomponent mixtures.	2	2		1		1	1			1	2	1
CO3. Determine the number of stages required for separation of liquid-liquid and solid-liquid extraction process.	2	2		1		1	1			1	2	2
CO4. Understand the adsorption mechanism and adsorption equilibrium.	2	2		1		1	1			1	2	2
Subject Name:- TRANSPORT PHENOMENON; Subject Code:- KCH 602												
Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Understand the chemical and physical transport processes and their mechanism.	2	2		1		1	2	2	2	2	1	1
CO2. Do heat, mass and momentum transfer analysis samultaneously.	2	2		1		1	2	2	2	2	2	1
CO3. Analyze industrial problems along with appropriate approximations and boundary conditions.	2	2		1		1	2	2	2	2	2	1
CO4. Develop steady and time dependent solutions along with their limitations.	2	2		1		1	2	2	2	2	2	1

Subject Name:- CHEMICAL TECHNOLOGY; Subject Code:- KCH 603												
Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Understand the plant process and flow sheet.	2		1			2	1	1	1	1	1	2
CO2. Keep up the productivity while maintaining all safety norms stipulated, during their job.	2					2	2		2		2	2
CO3. Solve Engineering problems that are likely to come across during the operation of plants.	2		1			1	1	1	1	1	2	2
CO4. Suggest alternative manufacturing process in terms of Economic viability of the product.	2		1			2	2	1	1		1	2
CO5. Have enhanced employability.	2					1	2	1	1	1	2	2
Subject Name:- Departmental Elective- III (FUNDAMENTALS OF POLYMER SCIENCE AND ENGINEERING); Subject Code:- KCH 061*												
Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}

CO1. Evaluate the different molecular weight and size of the polymers. Identify the various polymers.	2			1		1	1	2	2	2	2	1
CO2. Understand the structure-properties relationship of polymeric materials. Decide which test methods are suitable for the measurement of various properties such as rheology and mechanical properties of polymers.	2			1		1	1	2	2	2	2	1
CO3. Understand the various mechanism of polymerization and choose suitable techniques for polymer synthesis.	2			1		1	1	2	2	2	1	1
CO4. Understand and analyze the various methods used for manufacturing polymers.	2			1		1	1	2	2	2	1	1
CO5. Identify various polymer processing techniques used for the fabrication of polymer-based products.	2			1		1	1	2	2	2	2	1
Subject Name:- CHEMICAL TECHNOLOGY LAB; Subject Code:- KCH 651												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Understand the basic concepts of production processes.	2		2			2	2	1	2	1	2	1
CO2. Conduct experimental procedure for manufacture of soap, organic chemicals etc and analyze them.	2		2			1	2	1	2	2	2	1
CO3. Make the students aware of basic safety considerations during handling of chemicals, glass ware usage, instruments used in analysis and production activities.	2		2			1	2	1	2	2	2	1
CO4. Enhance their practical knowledge and thus their employability	2		2				2	1	1	1	2	2
Subject Name:- MASS TRANSFER-II LAB; Subject Code:- KCH 652												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Analyze the data on Analyze vapor-liquid equilibrium and Boiling point diagram.	2	2	2			1	1		1		1	2
CO2. Discuss the performance of distillation column.	2	2	2			1	1		2		1	2
CO3. Explain the adsorption kinetics and isotherm at solid-liquid interface.	2	2	2			1	1		2		1	2
CO4. Understand the separation process by Liquid- Liquid Extraction and solid liquid extraction.	2	2	2			1	1		2		1	2
Subject Name:- TECHNICAL PRESENTATION**; Subject Code:-** KCH 653												

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Improve their communication skill.	2					1	1		2	2	2	2
CO2. How to write refined report of any technical topics.	2					1	1		2	2	2	2
CO3. To learn new challenging area of their domain.	2					1	1		2	2	2	2
CO4. Knowledge of the application of Artificial Intelligence in Chemical Engineering.	**2**					**1**	**1**		**2**	**2**	**2**	**2**
CO5. Knowledge of automation through on ERP module training.	**2**					**1**	**1**		**2**	**2**	**2**	**2**

B. Tech IV Semester VII

Subject Name:- OPEN ELECTIVE COURSE-1 (Understanding the Human Being comprehensively Human Aspiration Audits fulfillments);
Subject Code:- ROE074

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. To help the students having the clarity about human aspirations, goal, activities and purpose of life.	2				1	2	2	2	2	1	1	
CO2. To facilitate the competence to understand the harmony in nature/existence and participation of human being in the nature/existence.	2				1	2	2	2	2	2	1	
CO3. To help the students to develop the understanding of human tradition and its various components.	2				1	2	2	2	2	2	1	

Subject Name:- DEPTT ELECTIVE COURSE-3 (IPA & Waste Management); Subject Code:- RCH072

Course Outcomes	2				1	1		2	1	2	1	PO_{12}
CO1. The students will get the knowledge of pollution control in process and waste management according to the environment standards specific to the following types of industries: chemical process and allied industries, food processing and allied industries, textile and allied industries, metallurgical and mining industries, cement and allied industries and mechanical, electrical, electronics and allied industries.	2					2	2	1		1	2	2
CO2. The students will acquaint with the industrial environmental management skills.	2					2	2	1		1	2	2

Subject Name:- DEPTT ELECTIVE COURSE-4(Project Engg & Management); Subject Code:- RCH076												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Students will be able to calculate the profitability, rate of return on investments and cost estimation.	2	2		1					1		2	2
CO2. After acquiring the knowledge in this subject, students become familiar with various aspects related to economics and can apply them for economic evaluation of chemical process and decide its economical feasibility and will make the students well aware about economic evaluation of dissertation work that they will undertake in final year of their curriculum.	2	2							1		2	2
Subject Name:- Process Modeling & Simulation; Subject Code:- RCH701												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. The students would develop an understanding of the mathematical treatment of typical chemical engineering processes.	2	2	2	1	2	1	2	2	1	1	1	1
CO2. The students are able to comprehend the concept of model formulation, analysis of variables, parameters, and degree of freedom for the solution of mathematical models through simulation.	2	2	2	1	2	1	2	2	1	1	1	1

Subject Name:- CAD Lab; Subject Code:- RCH751												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. The students are able to understand the simulation techniques for solving mathematical models of chemical engineering processes by means of computer programming and use of simulation software.	2	2	2	1	2	1	1	2	1	2	1	2
CO2. The students exhibit the skill of usage of software in simulating Chemical Engineering Problems.	2	2	2	1	2	1	1	2	1	2	1	1
Subject Name:- Energy Lab; Subject Code:- RCH752												

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. The students will develop the skills to handle the equipments at laboratory scale and can co-relate the theoretical aspects by performing experiments related to energy technology.	1	1	2			1	2			2	2	2
CO2. The students will develop the skill of presenting the results in form of written reports.CO5. Graduates will demonstrate skills to use modern engineering tools, software and equipments to analyze multidisciplinary problems.	1	1	2			1	1			1	2	2
Subject Name:- Industrial Training**; Subject Code:-** RCH753												
Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. An understanding of industrial operations, equipment used and industrial work atmosphere.	1	1	2			1	2			2	2	2
CO2. An ability to understand and handle industrial scale problems.	1	1	2			1	1			1	2	2

Subject Name:- Project-1; Subject Code:- RCH754												
Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. The student is able to incorporate his entire knowledge of chemical engineering principles to an industrial or academic problem.	2	2	1	2		1	1		2	2	2	2
CO2. The students to show their abilities to exhibit experimental, analytical and communication skills and make a record of the findings in the form of a report or thesis.	2	2	1	2		1	1		2	2	2	2
B. Tech IV Semester VIII												
Subject Name:- OPEN ELECTIVE COURSE-2 (Values, Relationship & Ethical Human Conduct-For a Happy & Harmonious Society); Subject Code:- ROE088												
Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. To explore human values. In this course students will be exposed to paradoxes of happiness, and dilemmas of transcendence and social transformation.	2				1	2	2	2	2	1	1	

CO2. To develop a practical philosophy of social transformation, which aims at creating a just order in which all are happy. If continuous happiness is the human aspiration then there should also be a human program to fulfill basic human aspirations.	2				1	2	2	2	2	2	1	
CO3. To question received notions of dichotomies of the Oriental and the Occidental, traditional and modern, and personal and social, and develop an integrated approach to value education based on natural acceptance of all, mutual fulfillment and co-existence.	2				1	2	2	2	2	2	1	
CO4. To provide perspectives on choices. It sensitizes them to short term and long term consequences of their decisions for themselves and for the larger society.	2				1	2	2	2	2	2	1	
CO5. After completing this course a student must be wiser not only to choose his/her career in a technical field but also to adopt a line of action for nation building.	2				1	1		2	1	2	1	
Subject Name:- DEPTT ELECTIVE COURSE-5 (Fertilizer Technology); Subject Code:- RCH081												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Introduction with the fertilizer technique.	1					1	2			1		1
CO2. Develop knowledge of different fertigation processes.weldments.	1					2	2			1		1
Subject Name:- DEPTT ELECTIVE COURSE-6 (Petroleum Refining); Subject Code:- RCH086												
Course Outcomes	**PO_1**	**PO_2**	**PO_3**	**PO_4**	**PO_5**	**PO_6**	**PO_7**	**PO_8**	**PO_9**	**PO_{10}**	**PO_{11}**	**PO_{12}**
CO1. Introduction with the petroleum refinery worldwide.	2					1	2	1	2		1	2
CO2. Develop knowledge of different refining processes.	2					1	2	1	1	1	1	2
CO3. Develop knowledge of safety and pollution control in the refining industries.	2					1	2	1	1	1	1	2
CO4. To find the suitable refining technology for maximizing the gasoline yield.	2					1	2	2		1		1
Subject Name:- Seminar; Subject Code:- RCH851												

Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. Improve their communication skill.	1			1		1	1	1	2	2		2
CO2. This seminar will help them to enhance their personality.	1					1	1	2	2	2		2
CO3. To learn new challenging area of their domain.	1					1	1	1	2	2		1
Subject Name:- Project-2; Subject Code:- RCH852												
Course Outcomes	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}
CO1. The student is able to incorporate his entire knowledge of chemical engineering principles to an industrial or academic problem.	2	2	1	2		1	1		2	2	2	2
CO2. The students to show their abilities to exhibit experimental, analytical and communication skills and make a record of the findings in the form of a report or thesis.	2	2	1	2		1	1		2	2	2	2

PROGRAM OUTCOMES (POs)

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.