Articulation Matrix of M.Tech Courses_(I – II semester)_2018-19

CO	STATEMENT	CORRELATION WITH PROGRAM OUTCOMES												CORRELATION WITH PROGRAM SPECIFIC 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	PSO 1	PSO 2	PSO 3
CHT601.1	The students understood the chemical and physical transport processes and their mechanism, heat, mass and momentum transfer analysis of simple processes	3	2	--	1	--	--	--	--	--	1	--	1	2	1	--
CHT601.2	The students understood how to solve differential momentum, heat, and mass balances for 1-D steady state problems and quasi-steady-state problems occurring in laminar	3	3	--	--	--	--	--	--	--	1	--	1	3	2	1
CHT601.3	The students understood how to formulate conservation statements in heat, mass, and momentum at multi-scales from microscopic to macroscopic in both steady	3	2	--	--	--	--	--	--	--	1	--	1	3	1	--
CHT601.4	The students understood how to analyze advanced transport problems in heat, mass, and momentum, both macroscopic and microscopic formulate simultaneous	2	2	--	--	--	--	--	--	--	1	--	1	2	2	1
CHT601	**Transport Phenomena**	**3**	**3**	**--**	**1**	**--**	**--**	**--**	**--**	**--**	**1**	**--**	**1**	**3**	**2**	**1**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CH602.1	Students understood the complex problem solving approach, which help them in solving the practical problems given in the project.	3	3	2	2	3	1	2	1	0	1	0	2	3	2	2
CH602.2	Students understood the basic fundamentals of heat, mass and momentum transfer.	3	3	2	2	3	1	2	1	0	1	0	2	3	3	2
CHT602	**Mathematical Methods in Chemical Engineering**	**3**	**3**	**2**	**2**	**3**	**1**	**2**	**1**	**0**	**1**	**0**	**2**	**3**	**3**	**2**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT603.1	Student understood the kinetics of the chemical reactions involving solid catalysts.	3	3	1	--	--	2	3	2	2	--	--	2	2	1	1
CHT603.2	Effect of mass transfer on overall rate of reaction has been well understood.	3	3	3	2	--	1	2	1	2	--	--	2	3	2	1
CHT603.3	Concept of effectiveness factor and governing resistances for a process made clear.	3	3	3	2	2	2	2	2	2	--	--	2	2	2	--
CHT603.4	Understood the operation and design aspects of various multiphase chemical reactors like Trickle bed reactor, Slurry reactor, Packed bed reactors etc.	3	3	3	3	2	3	3	2	2	--	--	2	3	2	2
CHT603	**Chemical Reactor Analysis**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**--**	**--**	**2**	**3**	**2**	**2**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT604.1	Able to understand how physical world can be modeled	3	3	1	--	1	--	--	--	--	--	--	1	2	2	2
CHT604.2	Understood several mathematical techniques to solve and analyze the physical problems.	3	3	2	2	2	--	--	--	1	--	--	1	3	2	2
CHT604	**Modelling and Simulation**	**3**	**3**	**2**	**2**	**2**	**--**	**--**	**--**	**1**	**--**	**--**	**1**	**3**	**2**	**2**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT605.1	Understand the concepts of multi-component systems and interpret solution properties.	3	3	2	2	1	--	--	1	3	2	1	2	2	2	3
CHT605.2	Perform phase equilibria calculations using various thermodynamic models.	3	2	2	2	3	1	--	1	3	2	2	1	3	2	2
CHT605.3	Calculate parameters of chemical reaction equilibria.	3	1	2	3	3	--	--	1	3	2	2	1	2	2	2
CHT605.4	Understand the concept of Statistical Thermodynamics.	2	3	1	3	2	2	2	2	3	2	3	3	2	3	3
CHT605	**Chemical Engineering Thermodynamics**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**3**	**2**	**3**	**3**	**3**	**3**	**3**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT606.1	Choose a suitable separation technique for separation of product mixture	3	3	1	1	--	1	2	--	1	--	--	1	2	2	1
CHT606.2	Understated the concept of membrane based separation technique	2	2	3	2	1	--	3	2	--	1	2	2	3	2	--
CHT606.3	Understand the fundamental of ion exchange and other advanced separation techniques	1	--	2	3	2	3	1	3	2	3	1	--	1	3	2
CHT606	**Advanced Separation Processes**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT607.1	Understanding of fundamental mathematics and to solve problems of algebraic and differential equations, partial differential equations	3	2	1	--	--	1	--	--	1	1	--	1	2	1	2
CHT607.2	Ability to convert problem solving strategies to procedural algorithms and to write program structures	3	3	2	3	1	--	--	--	1	2	--	1	3	1	1
CHT607.3	Ability to solve engineering problems using computational techniques	3	3	2	2	--	--	--	--	1	2	--	1	2	2	2
CHT607.4	Ability to assess reasonableness of solutions, and select appropriate levels of solution sophistication	3	2	1	2	2	1	1		1	1	--	--	1	2	2
CHT607	**Computational Methods in Chemical Engineering**	**3**	**3**	**2**	**3**	**2**	**1**	**1**	**--**	**1**	**2**	**--**	**1**	**3**	**2**	**2**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT609.1	Students will understand the concepts of water and air pollution, and made aware of legislation and standards pertaining to water and air pollution.	1	1	1	1	--	2	3	2	--	1	1	1	1	2	1
CHT609.2	Students will understand the fundamentals of air pollution and its control.	3	2	3	1	1	1	3	1	1	1	1	--	2	3	1
CHT609.3	Students will understand the design (process) of wastewater treatment plant	3	2	3	1	1	--	3	1	1	1	1	--	1	3	2
CHT609.4	Students will understand solid waste management practices and recovery of useful products	1	1	1	1	1	1	3	1	--	1	1	1	1	2	1
CHT609	**Pollution Control System**	**3**	**2**	**3**	**1**	**1**	**2**	**3**	**2**	**1**	**1**	**1**	**1**	**2**	**3**	**2**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT610.1	Understood the problem formulation with the help of given statements, the graphical solution of linear programming problems of two variables.	3	3	2	2	3	3	1	2	--	1	--	--	3	2	1
CHT610.2	Understood different optimization tool or methods which can solve the real life and industry related problems for single and multi-variables.	3	3	2	3	3	2	1	1	--	1	2	2	3	2	2
CHT610.3	Understood the efficiency of various optimization techniques based on its fast convergence, different optimization techniques which can be used to find out the optimum solution.	1	3	2	3	3	2	3	2	1	3	3	3	3	1	2
CHT610	**Optimization of Chemical Process**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**1**	**3**	**3**	**--**	**3**	**2**	**2**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT612.1	Students understood the fundamentals of transport processes in heterogeneous reactors and catalyst selectivity and deactivation.	1	1	1	--	--	--	1	1	1	--	--	1	1	1	1
CHT612.2	Students designed various heterogeneous reactors operating isothermally, adiabatically, and under non-adiabatic conditions.	3	3	3	--	--	--	1	1	1	--	--	1	3	2	1
CHT612	**Catalyst Theory and Practice**	**3**	**3**	**3**	**2**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**1**	**3**	**2**	**1**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT613.1	To understand the properties and their significance of crude oils and petroleum fractions	3	2	--	1	--	2	2	3	2	--	1	1	2	2	1
CHT613.2	To understand, design and analyze the various petroleum refinery processes including primary, secondary and supporting processes.	3	1	3	3	3	2	1	--	--	1	2	1	3	2	2
CHT613.3	To understand various conversion processes used to produce various petroleum products.	2	2	3	3	3	2	1	--	--	3	2	2	2	2	2
CHT613.4	To get familiarized with challenges involved in refining from viewpoint of environment.	2	1	1	1	--	1	3	--	--	2	1	2	2	3	3
CHT613	**Petroleum Refining Engineering**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**3**

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		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CHT615.1	Learn the fundamentals of cells, cell construction, cell construction chemicals, Enzyme kinetics i.e., enzyme catalyzed reactions, enzyme immobilization.	3	2	1	1	--	2	1	1	1	--	--	--	2	1	1
CHT615.2	Learn the microorganisms growth stages and its quantifications, modeling of growth kinetics, factors affecting the growth, microbial immobilization	3	3	3	2	--	1	1	1	1	--	--	--	2	2	1
CHT615.3	Learn the basics and the design of biochemical reactors -batch and continuous reactors, reactors with recycle, reactors in series etc.	3	3	2	3	--	1	2	--	1	--	--	1	3	2	2
CHT615.4	Recall various unit operation techniques and their use for the separation processes of the cells and biochemical products	2	3	3	3	--	1	3	1	1	--	--	1	3	2	1
CHT615.5	Apply the concepts of biochemical principles for the production of industrial important chemicals by microorganisms, treatment of industrial and municipal wastes.	3	3	3	1	1	2	3	--	1	--	--	1	3	2	1
CHT615	**Bioprocess Engineering**	**3**	**3**	**3**	**3**	**1**	**2**	**3**	**1**	**1**	**--**	**--**	**1**	**3**	**2**	**2**

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation