

**ACADEMIC CURRICULA**  
**UNDERGRADUATE/ INTEGRATED**  
**POST GRADUATE DEGREE**  
**PROGRAMMES**

**(With exit option of Diploma)**

**(Choice Based Flexible Credit System)**

**Regulations 2021**

**Volume – 1**

**(Revised on July 2024)**



**SRM**  
INSTITUTE OF SCIENCE & TECHNOLOGY  
(Deemed to be University u/s 3 of UGC Act, 1956)

**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**

**(Deemed to be University u/s 3 of UGC Act, 1956)**

**Kattankulathur, Chengalpattu District 603203,**

**Tamil Nadu, India**

### 15. B.Tech. in Chemical Engineering

#### 15. (a) Mission of the Department

Mission Stmt – 1	<i>To facilitate high quality education, well grounded in the fundamental and applied areas of engineering necessary for learners to contribute effectively to chemical and allied industries</i>
Mission Stmt – 2	<i>To educate, prepare, inspire and mentor learners with the technical and professional skill-set necessary to excel as professionals, grow in their careers and contribute to chemical engineering science and technology</i>
Mission Stmt – 3	<i>To inculcate social-responsibility in learners and train them to contribute effectively to science and society</i>

#### 15. (b) Program Educational Objectives (PEO)

PEO – 1	<i>Utilizing their strong fundamental knowledge from the program be able to solve technical problems and contribute to chemical and allied industries</i>
PEO – 2	<i>Pursuing higher studies and/or continuously upgrading their skill-sets with technological advances leading to personal and professional growth and successful careers</i>
PEO – 3	<i>Establishing themselves with successful careers in industry, academia and/or as entrepreneurs that will enable them to address social, economic and environmental challenges and contribute to science and society</i>

#### 15. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3
PEO - 1	3	2	1
PEO - 2	2	3	1
PEO - 3	2	1	3

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

#### 15. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)

	Program Outcomes (PO)												Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	12	PSO-1	PSO-2	PSO-3
	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning			
PEO - 1	3	3	3	3	2	-	-	-	2	2	2	-	3	3	2
PEO - 2	3	3	3	3	2	-	2	2	-	-	-	2	3	2	2
PEO - 3	2	2	2	2	-	3	2	2	3	3	3	2	3	2	3

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

#### PSO – Program Specific Outcomes (PSO)

PSO - 1	<i>Ability to understand and differentiate processes</i>
PSO - 2	<i>Apply the fundamentals to perform computations related to synthesis, design and analysis of chemical processes</i>
PSO - 3	<i>Analyze the process plants from Energy, Environment and Safety related aspects</i>

15. (e) Program Structure: B.Tech. in Chemical Engineering

Humanities & Social Sciences including Management Courses (H)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21LEH101T	Communicative English	2	1	0	3	
21LEH102T	Chinese					
21LEH103T	French					
21LEH104T	German					
21LEH105T	Japanese	2	1	0	3	
21LEH106T	Korean					
21LEH107T	Spanish					
21LEH108T	Russian					
21GNH101J	Philosophy of Engineering	1	0	2	2	
21PDH209T <sup>1</sup>	Social Engineering	2	0	0	2	
21GNH401T	Behavioral Psychology	2	1	0	3	
Total Credits 13						

Engineering Science Courses (S)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21CSS101J	Programming for Problem Solving	3	0	2	4	
21MES101L <sup>1</sup>	Basic Civil and Mechanical Workshop	0	0	4	2	
21MES102L <sup>1</sup>	Engineering Graphics and Design	0	0	4	2	
21EES101T	Electrical and Electronics Engineering	3	1	0	4	
21CHS201T	Introduction to Chemical Engineering	3	0	0	3	
21CHS303J	Computational Methods in Chemical Engineering	2	0	2	3	
21DCS201P <sup>1</sup>	Design Thinking and Methodology	1	2	0	3	
21CSS303T	Data Science	2	0	0	2	
Total Credits 23						

Open Elective Courses (O) (Any 3 Courses)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21CHO101T	Sustainable Energy Engineering	3	0	0	3	
21CHO102T	Petroleum Engineering	3	0	0	3	
21CHO103T	Fundamentals of Chemical Engineering	3	0	0	3	
21CHO104T	Process Plant Safety	3	0	0	3	
21CHO105T	Pollution Abatement	3	0	0	3	
Total Credits 09						

Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21GNP301L <sup>1</sup>	Community Connect	0	0	2	1	
21CHP302L <sup>1</sup>	Project	0	0	6	3	
21CHP303T <sup>1</sup>	MOOC	3	0	0		
21CHP401L	Major Project	0	0	30	15	
21CHP402L	Major Project	0	0	20	10	
21CHP403L	Internship#	0	0	10	5	
Total Credits 19						

Basic Science Courses (B)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21MAB101T	Calculus and Linear Algebra	3	1	0	4	
21CYB101J	Chemistry	3	1	2	5	
21BTB103T	Biology	2	0	0	2	
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4	
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5	
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4	
21MAB202T	Numerical Methods	3	1	0	4	
Total Credits 28						

Professional Core Courses (C)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21CHC101J	Physical and Analytical Chemistry	2	0	2	3	
21CHC202T	Chemical Process Calculations	3	1	0	4	
21CHC203J	Mechanical Operations	2	0	2	3	
21CHC204J	Chemical Engineering Fluid Mechanics	2	0	2	3	
21CHC205J	Heat Transfer	3	0	2	4	
21CHC206T	Chemical Process Technology	3	0	0	3	
21CHC301T <sup>2</sup>	Chemical Engineering Thermodynamics	3	1	0	4	
21CHC302J	Mass Transfer Applications	3	0	2	4	
21CHC304J	Chemical Reaction Engineering	3	0	2	4	
21CHC305J	Process Dynamics, Control and Instrumentation	2	0	2	3	
21CHC306T <sup>2</sup>	Transport Phenomena	3	0	0	3	
21CHC307J	Process Modeling and Simulation	2	0	2	3	
21CHC401J <sup>2</sup>	Process Equipment Design and Drawing	2	0	2	3	
21CHC402T	Process Economics and Project Management	3	0	0	3	
21CSC206T	Artificial Intelligence	2	1	0	3	
Total Credits 50						

Non Credit Courses (M)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21PDM101L <sup>1</sup>	Professional Skills and Practices	0	0	2	0	
21PDM102L <sup>1</sup>	General Aptitude	0	0	2		
21PDM201L <sup>1</sup>	Verbal Reasoning	0	0	2		
21PDM202L <sup>1</sup>	Critical and Creative Thinking Skills	0	0	2		
21PDM301L <sup>1</sup>	Analytical and Logical Thinking Skills	0	0	2		
21PDM302L <sup>1</sup>	Employability Skills and Practices	0	0	2		
21CYM101T <sup>1</sup>	Environmental Science	1	0	0	0	
21LEM101T <sup>1</sup>	Constitution of India	1	0	0	0	
21LEM102T <sup>1</sup>	Universal Human Values – Introduction	1	0	0	0	
21LEM201T <sup>1</sup>	Professional Ethics	1	0	0	0	
21LEM202T <sup>1</sup>	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3	
21LEM301T <sup>1</sup>	Indian Art Form	1	0	0	0	
21LEM302T <sup>1</sup>	Indian Traditional Knowledge	1	0	0	0	
21GNM101L <sup>1</sup>	Physical and Mental Health using Yoga	0	0	2	0	
21GNM102L <sup>1</sup>	National Service Scheme					
21GNM103L <sup>1</sup>	National Cadet Corps					
21GNM104L <sup>1</sup>	National Sports Organization					
Total Credits 03						

Professional Elective Courses (E) (Any 6 Courses)							Professional Elective Courses (E)						
Course Code	Course Title	Hours / Week					Course Code	Course Title	Hours / Week				
		L	T	P	C				L	T	P	C	
21CHE351T	Renewable Energy Engineering	3	0	0	3		21CHE362T	Air Pollution Control Engineering	3	0	0	3	
21CHE352T	Introduction to Biochemical Principles	3	0	0	3		21CHE363T	Wastewater Treatment	3	0	0	3	
21CHE353T	Energy Engineering and Technology	3	0	0	3		21CHE364T	Chemical Process Optimization	3	0	0	3	
21CHE354T	Polymer Technology	3	0	0	3		21CHE365T	Equilibrium Stage Operations	3	0	0	3	
21CHE355T	Industrial Pollution Prevention and Control	3	0	0	3		21CHE366T	Computational Fluid Dynamics	3	0	0	3	
21CHE356T	Enzyme Engineering	3	0	0	3		21CHE367T	Biochemical Process Design	3	0	0	3	
21CHE357T	Fertilizer Technology	3	0	0	3		21CHE368T	Micro Chemical Systems	3	0	0	3	
21CHE358T	Petroleum Technology	3	0	0	3		21CHE369T	Electrochemical Engineering	3	0	0	3	
21CHE359T	Principles of Membrane Separation	3	0	0	3		21CHE370T	Petrochemical Technology	3	0	0	3	
21CHE360T	Safety and Hazard Analysis in Process Industries	3	0	0	3		21CHE371T	Food Technology	3	0	0	3	
21CHE361T	Fundamentals of Desalination	3	0	0	3		21CHE372T	Introduction to Process Plant Simulation	3	0	0	3	
							Total Credits						18



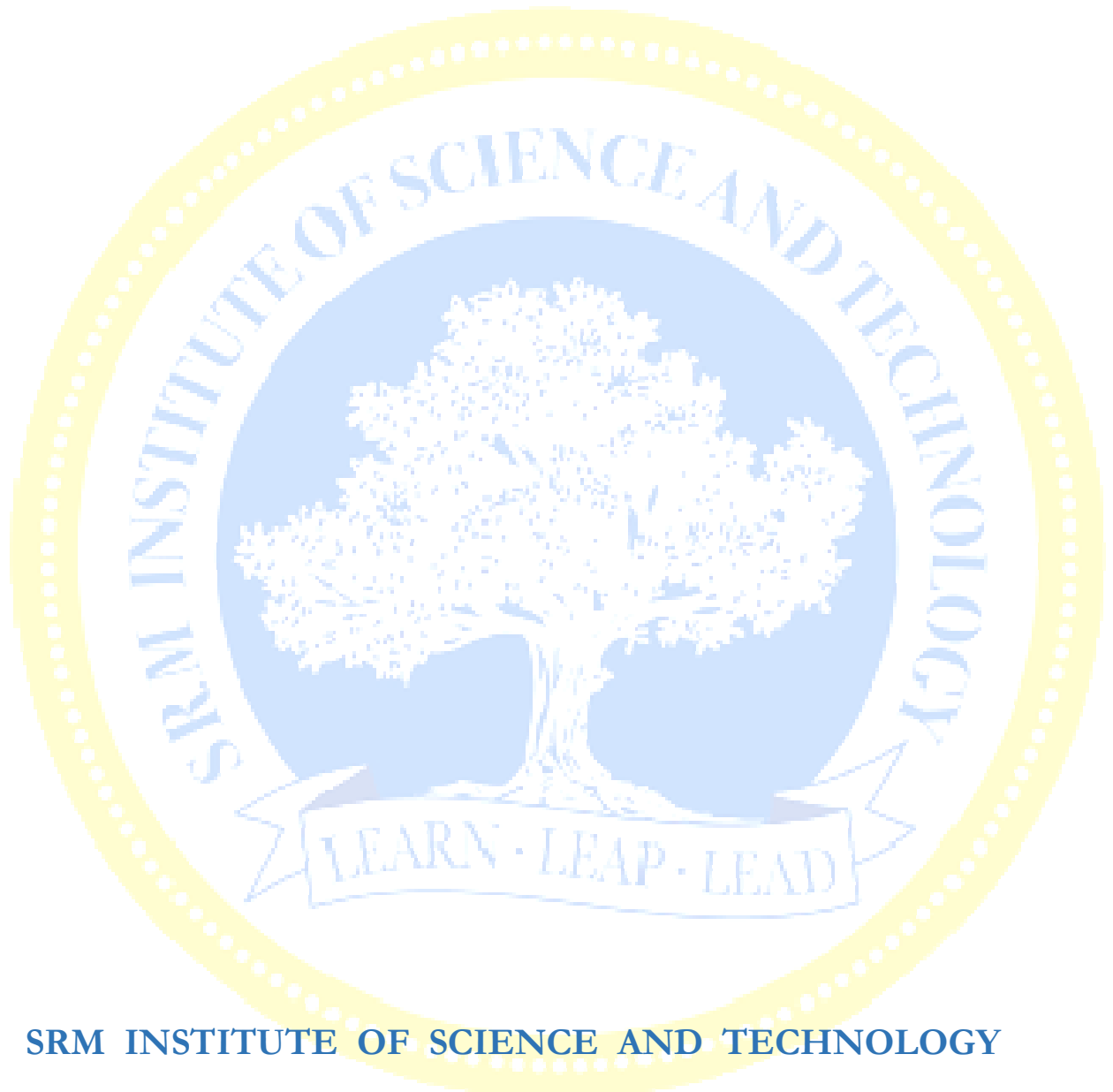
**15. (f) Programme Articulation: B.Tech. in Chemical Engineering**

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# 15. (g) Implementation Plan: B.Tech. in Chemical Engineering

Semester – I							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21LEH101T	Communicative English	2	1	0	3		
21MAB101T	Calculus and Linear Algebra	3	1	0	4		
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5		
21MES102L <sup>1</sup>	Engineering Graphics and Design	0	0	4	2		
21EES101T	Electrical and Electronics Engineering	3	1	0	4		
21CYM101T <sup>1</sup>	Environmental Science*	1	0	0	0		
21PDM101L <sup>1</sup>	Professional Skills and Practices	0	0	2	0		
21LEM101T <sup>1</sup>	Constitution of India	1	0	0	0		
Total Credits					18		
Semester – II							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21LEH102T	Chinese						
21LEH103T	French						
21LEH104T	German						
21LEH105T	Japanese	2	1	0	3		
21LEH106T	Korean						
21LEH107T	Spanish						
21LEH108T	Russian						
21GNH101J	Philosophy of Engineering	1	0	2	2		
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4		
21CYB101J	Chemistry	3	1	2	5		
21CHC101J	Physical and Analytical Chemistry	2	0	2	3		
21CSS101J	Programming for Problem Solving	3	0	2	4		
21BTB103T	Biology	2	0	0	2		
21MES101L <sup>1</sup>	Basic Civil and Mechanical Workshop	0	0	4	2		
21PDM102L <sup>1</sup>	General Aptitude*	0	0	2	0		
21GNM101L <sup>1</sup>	Physical and Mental Health using Yoga						
21GNM102L <sup>1</sup>	National Service Scheme	0	0	2	0		
21GNM103L <sup>1</sup>	National Cadet Corps						
21GNM104L <sup>1</sup>	National Sports Organization						
Total Credits					25		
Semester – III							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4		
21CHC202T	Chemical Process Calculations	3	1	0	4		
21CHC203J	Mechanical Operations	2	0	2	3		
21CHC204J	Chemical Engineering Fluid Mechanics	2	0	2	3		
21PDH209T <sup>1</sup>	Social Engineering	2	0	0	2		
21CHS201T	Introduction to Chemical Engineering	3	0	0	3		
21LEM201T <sup>1</sup>	Professional Ethics	1	0	0	0		
21PDM201L <sup>1</sup>	Verbal Reasoning	0	0	2	0		
21LEM202T <sup>1</sup>	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3		
Total Credits					22		
Semester – IV							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21MAB202T	Numerical Methods	3	1	0	4		
21CSC206T	Artificial Intelligence	2	1	0	3		
21CHC205J	Heat Transfer	3	0	2	4		
21CHC206T	Chemical Process Technology	3	0	0	3		
E	Professional Elective – I	3	0	0	3		
21DCS201P <sup>1</sup>	Design Thinking and Methodology	1	2	0	3		
21PDM202L <sup>1</sup>	Critical and Creative Thinking Skills	0	0	2	0		
Total Credits					20		
Semester – V							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21CHC301T <sup>2</sup>	Chemical Engineering Thermodynamics	3	1	0	4		
21CHC302J	Mass Transfer Applications	3	0	2	4		
21CHS303J	Computational Methods in Chemical Engineering	2	0	2	3		
21CHC304J	Chemical Reaction Engineering	3	0	2	4		
O	Open Elective – I	3	0	0	3		
E	Professional Elective – II	3	0	0	3		
21PDM301L <sup>1</sup>	Analytical and Logical Thinking Skills	0	0	2	0		
21LEM301T <sup>1</sup>	Indian Art Form	1	0	0	0		
21GNP301L <sup>1</sup>	Community Connect	0	0	2	1		
Total Credits					22		
Semester – VI							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21CSS303T	Data Science	2	0	0	2		
21CHC305J	Process Dynamics, Control and Instrumentation	2	0	2	3		
21CHC306T <sup>2</sup>	Transport Phenomena	3	0	0	3		
21CHC307J	Process Modeling and Simulation	2	0	2	3		
E	Professional Elective – III	3	0	0	3		
E	Professional Elective – IV	3	0	0	3		
21CHP303T <sup>1</sup>	MOOC	3	0	0	3		
21CHP302L <sup>1</sup>	Project	0	0	6	3		
O	Open Elective – II	3	0	0	3		
21PDM302L <sup>1</sup>	Employability Skills and Practices	0	0	2	0		
21LEM302T <sup>1</sup>	Indian Traditional Knowledge	1	0	0	0		
Total Credits					23		
Semester – VII							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21GNH401T	Behavioral Psychology	2	1	0	3		
21CHC401J <sup>2</sup>	Process Equipment Design and Drawing	2	0	2	3		
21CHC402T	Process Economics and Project Management	3	0	0	3		
E	Professional Elective – V	3	0	0	3		
E	Professional Elective – VI	3	0	0	3		
O	Open Elective – III	3	0	0	3		
Total Credits					18		
Semester – VIII							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21CHP401L	Major Project	0	0	30	15		
21CHP402L	Major Project	0	0	20	10		
21CHP403L	Internship#	0	0	10	5		
Total Credits					15		

#Students have to register either 21CHP401L or 21CHP402L and 21CHP403L both in eighth semester



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