ACADEMIC CURRICULA

UNDERGRADUATE DEGREE PROGRAMMES

Bachelor of Technology

(B.Tech. - Four Years)

(Choice Based Flexible Credit System)

Regulations 2018

Volume - 1

(Revised in March 2019)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Kancheepuram District 603203, Tamil Nadu, India

7. B.Tech. in Chemical Engineering

7. (a) Mission of the Department

Mission Stmt - 1	*To provide training that help students to develop an ability to meet the expectations of Industry, Academia and Research in the fields of Chemical and allied process industries.*
Mission Stmt - 2	*To develop skills of the students including leadership, project management, creative thinking and trouble shooting.*
Mission Stmt - 3	*To implant ethical, environment and social responsibility among the students.*
Mission Stmt - 4	*To play a role in improving the life of living beings by addressing their issues in rural, urban and industrial sectors using chemical engineering principles.*
Mission Stmt - 5	*To actively participate and contribute in upcoming technological advancements globally and locally, and also to solve the problems arising against sustainable development.*

7. (b) Program Educational Objectives (PEO)

PEO - 1	*To prepare and facilitate graduating students for job opportunities in Research and development, production and process development in oil and gas, petrochemical, plastics and rubber, pharmaceutical, Biotechnology, food and environmental industries.*
PEO - 2	*To empower undergraduate students with skill-sets and tools necessary for pursuing higher education in Chemical engineering and allied areas of technology.*
PEO - 3	*Empower students to become entrepreneurs for small-scale chemical and allied industries.*
PEO - 4	*To enable students to strive towards Sustainable development.*

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

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3	Mission Stmt. - 4	Mission Stmt. - 5
PEO - 1	*H*	*H*	*H*	*H*	*H*
PEO - 2	*H*	*H*	*H*	*H*	*M*
PEO - 3	*H*	*M*	*M*	*M*	*M*
PEO - 4	*M*	*M*	*M*	*M*	*M*

H – High Correlation, M – Medium Correlation, L – Low Correlation

7. (d) Mapping Program Educational Objectives (PEO) to Program Learning Outcomes (PLO)

	Program Learning Outcomes (PLO)														
	Graduate Attributes (GA)												Program Specific Outcomes (PSO)		
	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
PEO - 1	*H*	*H*	*H*	*H*	*H*	*M*	*H*	*M*	*M*	*M*	*H*	*M*	*H*	*H*	*H*
PEO - 2	*H*	*H*	*H*	*H*	*H*	*M*	*H*	*M*	*M*	*M*	*H*	*M*	*H*	*H*	*H*
PEO - 3	*H*	*H*	*H*	*H*	*H*	*M*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*
PEO - 4	*M*	*M*	*M*	*M*	*M*	*M*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*

H – High Correlation, M – Medium Correlation, L – Low Correlation , PSO – Program Specific Outcomes (PSO)

PSO – Program Specific Outcomes (PSO)

PSO - 1	*Ability to understand and differentiate processes*
PSO - 2	*Apply the fundamentals to perform equipment design and process design*
PSO - 3	*Evaluate the process plants from Energy, Environment and Safety related aspects*

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

1. Humanities & Social Sciences including Management Courses (H)

Course Code	Course Title	Hours/ Week L	T	P	C
18LEH101J	English	2	0	2	3
18LEH102J	Chinese	2	0	2	3
18LEH103J	French				
18LEH104J	German				
18LEH105J	Japanese				
18LEH106J	Korean				
18PDH101T	General Aptitude	0	0	2	1
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDH103T	Social Engineering	2	0	0	2
18PDH201T	Employability Skills & Practices	0	0	2	1
	Total Learning Credits				**12**

2. Basic Science Courses (B)

Course Code	Course Title	Hours/ Week L	T	P	C
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18CYB102J	Concepts in Chemistry	3	1	2	5
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18MAB202T	Numerical Methods for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
	Total Learning Credits				**28**

3. Engineering Science Courses (S)

Course Code	Course Title	Hours/ Week L	T	P	C
18MES101L	Engineering Graphics and Design	1	0	4	3
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5
18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3
18CSS101J	Programming for Problem Solving	3	0	4	5
18CHS201J	Physical and Analytical Chemistry	3	0	2	4
18PYS201T	Materials Science	3	0	0	3
18CHS204T	Engineering Thermodynamics	3	0	0	3
	Total Learning Credits				**26**

4. Professional Core Courses (C)

Course Code	Course Title	Hours/ Week L	T	P	C
18CHC203T	Chemical Process Calculations	3	1	0	4
18CHC205T	Chemical Engineering Fluid Mechanics	3	0	0	3
18CHC206T	Mechanical operations	3	0	0	3
18CHC207T	Heat Transfer	4	0	0	4
18CHC301T	Chemical Engineering Thermodynamics	3	0	0	3
18CHC208T	Principles of Mass Transfer	3	0	0	3
18CHC209L	Chemical Engineering Laboratory - I	0	0	4	2
18CHC302T	Chemical Reaction Engineering	3	0	0	3
18CHC303T	Mass Transfer Applications	3	0	0	3
18CHC304T	Chemical Process Technology	4	0	0	4
18CHC305L	Chemical Engineering Laboratory - II	0	0	4	2
18CHC306T	Transport Phenomena	3	0	0	3
18CHC307T	Reactor Analysis and Catalysis	3	0	0	3
18CHC308T	Process Dynamics, Control and Instrumentation	3	0	0	3
18CHC401J	Process Equipment Design and Drawing	2	0	2	3
18CHC402T	Process Economics and Project Management	3	0	0	3
18CHC403J	Process Modeling and Simulation	2	0	2	3
18CHC309L	Chemical Engineering Laboratory - III	0	0	4	2
18CHC350T	Comprehension	0	1	0	1
	Total Learning Credits				**55**

5. Professional Elective Courses (E)
(Any 5 Elective Courses)

Course Code	Course Title	Hours/ Week L	T	P	C
18CHE351T	Renewable Energy Engineering	3	0	0	3
18CHE352T	Biochemical Principles	3	0	0	3
18CHE353T	Energy Engineering and Technology	3	0	0	3
18CHE354T	Polymer Technology	3	0	0	3
18CHE355T	Sustainable Engineering	3	0	0	3
18CHE356T	Industrial Pollution Prevention and Control	3	0	0	3
18CHE357T	Enzyme Engineering	3	0	0	3
18CHE358T	Fertilizer Technology	3	0	0	3
18CHE359T	Petroleum Technology	3	0	0	3
18CHE360T	Principles of Membrane Separation	3	0	0	3
18CHE361T	Safety & Hazard Analysis in Process Industries	3	0	0	3
18CHE362T	Fundamentals of Desalination	3	0	0	3
18CHE363T	Air Pollution Control Engineering	3	0	0	3
18CHE364T	Fine Chemicals Technology	3	0	0	3
18CHE365T	Waste Water Treatment	3	0	0	3
18CHE366T	Chemical Process Optimization	3	0	0	3
18CHE367T	Equilibrium Stage Operations	3	0	0	3
18CHE368T	Computational Fluid Dynamics	3	0	0	3
18CHE369T	Biochemical Process Design	3	0	0	3
18CHE370T	Micro Chemical Systems	3	0	0	3
18CHE371T	Electrochemical Engineering	3	0	0	3
18CHE372T	Petrochemical Technology	3	0	0	3
18CHE373T	Food Technology	3	0	0	3
18CHE374T	Computational Techniques in Chemical Eng.,	3	0	0	3
18CHE375T	Introduction to Process Plant Simulation	3	0	0	3
	Total Learning Credits				**15**

6. Open Elective Courses (O)

Course Code	Course Title	Hours/ Week L	T	P	C
18CHO101T	Sustainable Energy Engineering	3	0	0	3
18CHO102T	Petroleum Engineering	3	0	0	3
18CHO103T	Introduction to Chemical Engineering	3	0	0	3
18CHO104T	Process Plant Safety	3	0	0	3
18CHO105T	Pollution Abatement	3	0	0	3
18CHO106T	Introduction to Proteomics	3	0	0	3
	Total Learning Credits				**9**

7. Project Work, Seminar, Internship In Industry / Higher Technical Institutions (P)

Course Code	Course Title	Hours/ Week L	T	P	C
18CHP101L	Massive Open Online Course - I	0	0	2	1
18CHP102L	Industrial Training-I				
18CHP103L	Seminar - I				
18CHP104L	Massive Open Online Course - II	0	0	2	1
18CHP105L	Industrial Training-II				
18CHP106L	Seminar - II				
18CHP107L	Minor Project	0	0	6	3
18CHP108L	Internship (4-6 weeks)				
18CHP109L	Project	0	0	20	10
18CHP110L	Semester Internship				
	Total Learning Credits				**15**

Mandatory Courses (M)

Code	Course Title	L	T	P	C
18LEM102J	Value Education	1	0	1	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
18GNM102L	NSS	0	0	2	0
18GNM103L	NCC				
18GNM104L	NSO				
18LEM109T	Indian Traditional Knowledge	1	0	0	0
18LEM110L	Indian Art Form	0	0	2	0
18CYM101T	Environmental Science	1	0	0	0
18PDM101L	Professional Skills and Practices	0	0	2	0
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development				
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM204L	Business Basics for Entrepreneurs				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management				
18LEM101T	Constitution of India	1	0	0	0

7. (f) Program Articulation: B.Tech. in Chemical Engineering

Course Code	Course Name	Program Learning Outcomes (PLO)													
		Graduate Attributes												PSO	
		Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
18CHC203T	Chemical Process Calculations	H	H	M	M	H	L	L	L	L	L	L	H	H	M	L
18CHC205T	Chemical Engineering Fluid Mechanics	H	H	H	M	M	L	L	L	L	L	L	H	H	H	L
18CHC206T	Mechanical operations	H	H	H	M	M	L	L	L	L	L	L	H	H	H	L
18CHC207T	Heat Transfer	H	H	H	M	M	L	L	L	L	L	L	H	H	H	L
18CHC301T	Chemical Engineering Thermodynamics	H	H	H	M	M	L	L	L	L	L	L	H	H	H	L
18CHC208T	Principles of Mass Transfer	H	H	H	M	M	L	L	L	L	L	L	M	H	H	L
18CHC209L	Chemical Engineering Laboratory - I	H	H	H	M	M	L	L	L	H	L	L	H	H	H	L
18CHC302T	Chemical Reaction Engineering	H	H	H	M	M	L	L	L	L	L	L	H	H	H	L
18CHC303T	Mass Transfer Applications	H	H	H	M	M	L	L	L	L	L	L	M	H	H	L
18CHC304T	Chemical Process Technology	H	L	H	M	L	L	L	L	L	L	L	H	H	H	L
18CHC305L	Chemical Engineering Laboratory - II	H	H	M	M	M	L	L	L	H	L	L	H	H	M	L
18CHC306T	Transport Phenomena	H	H	M	M	L	L	L	L	L	L	L	M	H	M	L
18CHC307T	Reactor Analysis and Catalysis	H	H	H	M	M	L	L	L	L	L	L	M	H	H	L
18CHC308T	Process Dynamics, Control and Instrumentation	H	H	H	M	M	L	L	L	L	L	L	H	H	H	L
18CHC401J	Process Equipment Design and Drawing	H	H	H	M	H	L	L	L	L	L	L	H	H	H	L
18CHC402T	Process Economics and Project Management	H	H	M	L	M	H	H	L	L	L	H	H	H	M	M
18CHC403J	Process Modeling and Simulation	H	H	M	M	H	L	L	L	L	L	L	M	H	M	L
18CHC309L	Chemical Engineering Laboratory -III	H	H	M	M	M	L	L	L	H	L	L	M	H	M	L
18CHE351T	Renewable Energy Engineering	H	M	M	L	L	M	M	M	L	L	L	H	H	M	H
18CHE352T	Introduction to Biochemical Principles	H	M	M	L	L	L	L	L	L	L	L	H	H	M	L
18CHE353T	Energy Engineering and Technology	H	M	M	L	L	L	L	L	L	L	L	H	H	M	L
18CHE354T	Polymer Technology	H	L	L	L	L	L	L	L	L	L	L	H	H	L	L
18CHE355T	Sustainable Engineering	H	L	M	L	L	M	M	M	L	L	L	H	H	M	H
18CHE356T	Industrial Pollution Prevention and Control	H	L	M	L	L	M	M	M	L	L	L	H	H	M	H
18CHE357T	Enzyme Engineering	H	M	M	L	L	L	L	L	L	L	L	H	H	M	L
18CHE358T	Fertilizer Technology	H	L	M	L	L	M	M	L	L	L	L	M	H	M	M
18CHE359T	Petroleum Technology	H	L	M	L	L	L	L	L	L	L	L	H	H	M	M
18CHE360T	Principles of Membrane Separation	H	M	H	L	L	L	L	L	L	L	L	M	H	H	H
18CHE361T	Safety & Hazard Analysis In Process Industries	H	L	L	L	L	H	H	M	L	L	L	H	H	L	H
18CHE362T	Fundamentals of Desalination	H	M	H	L	L	L	L	L	L	L	L	M	H	H	M
18CHE363T	Air Pollution Control Engineering	H	M	M	L	L	M	M	M	L	L	L	H	H	M	H
18CHE364T	Fine Chemicals Technology	H	L	M	L	L	L	L	L	L	L	L	M	H	M	L
18CHE365T	Waste Water Treatment	H	L	H	L	L	M	M	M	L	L	L	H	H	H	H
18CHE366T	Chemical Process Optimization	H	H	H	M	L	L	L	L	L	L	L	H	H	H	L
18CHE367T	Equilibrium Stage Operations	H	H	H	M	M	L	L	L	L	L	L	H	H	H	L
18CHE368T	Computational Fluid Dynamics	H	H	H	M	H	L	L	L	L	L	L	H	H	H	L
18CHE369T	Biochemical Process Design	H	H	H	M	M	L	L	L	L	L	L	H	H	H	L
18CHE370T	Micro Chemical Systems	H	H	M	M	L	L	L	L	L	L	L	M	H	M	L
18CHE371T	Electrochemical Engineering	H	L	L	L	L	M	M	L	L	L	L	H	H	L	M
18CHE372T	Petrochemical Technology	H	L	L	L	L	L	L	L	L	L	L	L	H	L	M
18CHE373T	Food Technology	H	L	L	L	L	M	M	L	L	L	L	L	H	L	M
18CHE374T	Computational Techniques in Chemical Engineering	H	H	H	M	H	L	L	L	L	L	L	L	H	H	L
18CHE375T	Introduction to Process Plant Simulation	H	H	H	M	H	L	L	L	L	L	L	L	H	H	L
18CHP101L	Massive Open Online Course - I	H	M	M	M	M	M	M	M	M	L	L	M	H	M	M
18CHP102L	Industrial Training-I	H	M	M	M	M	M	M	M	M	L	L	M	H	M	M
18CHP103L	Seminar - I	H	M	M	M	M	M	M	M	M	L	L	M	H	M	M
18CHP104L	Massive Open Online Course - II	H	M	M	M	M	M	M	M	M	L	L	M	H	M	M
18CHP105L	Industrial Training-II	H	M	M	M	M	M	M	M	M	L	L	M	H	M	M
18CHP106L	Seminar - II	H	M	M	M	M	M	M	M	M	L	L	M	H	M	M
18CHP107L	Minor Project	H	H	H	M	H	M	M	M	M	H	M	H	H	H	M
18CHP108L	Internship (4-6 weeks)	H	H	H	M	H	M	M	M	M	H	M	H	H	H	M
18CHP109L	Project	H	H	H	M	H	M	M	M	M	H	M	H	H	H	M
18CHP110L	Semester Internship	H	H	H	M	H	M	M	M	M	H	M	H	H	H	M
	Program Average	H	H	H	H	M	M	M	L	M	M	M	H	H	H	M

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

Semester – I

Code	Course Title	Hours/ Week L	T	P	C
18LEH10XJ	Chinese / French / German / Japanese/ Korean	2	0	2	3
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18CYB102J	Concepts in Chemistry	3	1	2	5
18CSS101J	Programming for Problem Solving	3	0	4	5
18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3
18PDM101L	Professional Skills and Practices	0	0	2	0
18LEM102J	Value Education	1	0	1	0
18GNM102L	NSS	0	0	2	0
18GNM103L	NCC				
18GNM104L	NSO				
Total Learning Credits					**20**

Semester – II

Code	Course Title	Hours/ Week L	T	P	C
18LEH101J	English	2	0	2	3
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18MES101L	Engineering Graphics and Design	1	0	4	3
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5
18PDH101T	General Aptitude	0	0	2	1
18LEM101T	Constitution of India	1	0	0	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
Total Learning Credits					**21**

Semester – III

Code	Course Title	Hours/ Week L	T	P	C
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18CHS201J	Physical and Analytical Chemistry	3	0	2	4
18CHS204T	Engineering Thermodynamics	3	0	0	3
18CHC203T	Chemical Process Calculations	3	1	0	4
18CHC205T	Chemical Engineering Fluid Mechanics	3	0	0	3
18PDH103T	Social Engineering	2	0	0	2
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development				
18CYM101T	Environmental Science	1	0	0	0
Total Learning Credits					**20**

Semester – IV

Code	Course Title	Hours/ Week L	T	P	C
18MAB202T	Numerical Methods for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
18PYS201T	Materials Science	3	0	0	3
18CHC206T	Mechanical operations	3	0	0	3
18CHC207T	Heat Transfer	4	0	0	4
18CHC208T	Principles of Mass Transfer	3	0	0	3
18CHC209L	Chemical Engineering Laboratory - I	0	0	4	2
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM204L	Business Basics for Entrepreneurs				
Total Learning Credits					**23**

Semester – V

Code	Course Title	Hours/ Week L	T	P	C
18CHC301T	Chemical Engineering Thermodynamics	3	0	0	3
18CHC302T	Chemical Reaction Engineering	3	0	0	3
18CHC303T	Mass Transfer Applications	3	0	0	3
18CHC304T	Chemical Process Technology	4	0	0	4
18CHC305L	Chemical Engineering Laboratory - II	0	0	4	2
	Professional Elective – 1	3	0	0	3
	Professional Elective – 2	3	0	0	3
	Open Elective – 1	3	0	0	3
18CHP101L	Massive Open Online Course - I	0	0	2	1
18CHP102L	Industrial Training-I				
18CHP103L	Seminar – 1				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management				
18LEM110L	Indian Art Form	0	0	2	0
Total Learning Credits					**25**

Semester - VI

Code	Course Title	Hours/ Week L	T	P	C
18CHC306T	Transport Phenomena	3	0	0	3
18CHC307T	Reactor Analysis and Catalysis	3	0	0	3
18CHC308T	Process Dynamics, Control and Instrumentation	3	0	0	3
18CHC309L	Chemical Engineering Laboratory - III	0	0	4	2
18CHC350T	Comprehension	0	1	0	1
	Professional Elective – 3	3	0	0	3
	Professional Elective – 4	3	0	0	3
	Open Elective – 2	3	0	0	3
18CHP104L	Massive Open Online Course - II	0	0	2	1
18CHP105L	Industrial Training-II				
18CHP106L	Seminar - II				
18PDH201T	Employability Skills and Practices	0	0	2	1
18LEM109T	Indian Traditional Knowledge	1	0	0	0
Total Learning Credits					**23**

Semester - VII

Code	Course Title	Hours/ Week L	T	P	C
18CHC401J	Process Equipment Design and Drawing	2	0	2	3
18CHC402T	Process Economics and Project Management	3	0	0	3
18CHC403J	Process Modeling and Simulation	2	0	2	3
	Professional Elective – 5	3	0	0	3
	Open Elective – 3	3	0	0	3
18CHP107L	Minor Project	0	0	6	3
18CHP108L	Internship (4-6 weeks)				
Total Learning Credits					**18**

Semester - VIII

Code	Course Title	Hours/ Week L	T	P	C
18CHP109L	Project	0	0	20	10
18CHP110L	Semester Internship				
Total Learning Credits					**10**