



Course Template for Chemical Engineering

B.Tech	B.Tech - M.Tech. (PG Part - Category - A)	BS/B.Tech-M.Tech (Category - B)	Double Major	Minor	PG Courses
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AP -157
Senate / Agenda / 2015 -16 / 1st/02.9.2015 / ATR

B.TECH

Template No. CHE-1

		Semester							
		1 ST	2 ND	3 RD	4 TH	5 TH	6 TH	7 TH	8 TH
C O U R S E		MTH 101A [11]	CHM 102A [08]	CHE 251A [09]	ESC 201A [14]	CHE 312A [09]	CHE 331A [09]	CHE 453A [11]	HSS-5 (Level -2) [09]
		ESC 101A [14]	MTH 102A [11]	TA 202A [06]	TA 201A [06]	CHE 313A [09]	CHE 381A [11]	CHE 492A [08]	OE -5 [09]
		CHM 101A [03]	LIF 101A [06]	HSS-2 (Level -1) [11]	COM 200A [05]	CHE 352A [05]	CHE 391A [08]	OE -3 [09]	OE -6 [09]
		CHY 103A [11]	PHY 101A [03]	ESO -1 [11] (ESO 201A)	SO -1 [11] (CSO 201A / CSO 202A)	ESO -3 [14] (ESO 205A)	HSS-4 (Level -2) [09]	OE -4 [09]	DE -3 [09]
		PE 101A [03]	PHY 102A [11]	ESO -2 [11] (ESO 208A)	CHE 211A [09]	HSS-3 (Level -2) [09]	UGP -2/ DE -1 [09] (CHE 398A)	UGP -3 / DE -2 [09] (CHE 497A)	DE -4 [09]
					CHE 221A [09]	CHE 300A [02]			
	NG 112A/ HSS -1 (Level -1) [11]	TA 101A [09]		CHE 261A [06]	OE -1 [09]	OE -2 [09]	DE -M2 [05] (Optional)*	UGP -4 [09] (CHE 498A) (Extra Credits)	
		PE 102A [03]			DE -M1 [05] (Optional)*				
Total Credits		53	51	48	60	57 -66	55	46/51	45/54

MINIMUM CREDIT REQUIREMENT FOR GRADUATION:

Institute Core (IC)	: 124	Credits
Department Compulsory (DC)	: 105	Credits
Department Elective (DE)	: 36	Credits
Open Elective (OE)	: 54	Credits
SO / ESO	: 47	Credits
HSS (Level -I)	: 22	Credits
HSS (Level -II)	: 27	Credits
Total	: 415	Credits

REMARKS:

- a) *DE –M1 & M2 are Modular Courses which are optional summer training and may count towards DE credits.
- b) DE credits may include 18 credits from UGP –2 and UGP –3.
- c) UGP –1 and UGP –4 are optional and do not count towards DE/OE credits.
- d) Up to 18 DE credits may be waived from the minimum requirements for students opting for Dual Degree in Chemical Engineering itself.
- e) Up to 36 OE credits may be waived from the minimum requirements for students opting for Dual Degree in another department or the Double Major programme.

B.Tech - M.Tech. (PG Part - Category - A)(from the same department)

Template No. CHE-2

C O U R S E	PG Component				
	7 TH	8 TH	SUMMER	9 TH	10 TH
	CHE 701A [0]	CHE 702A [0]	M.Tech Thesis [09] (CHE 699A)(If required)	M.Tech Thesis [09] (CHE 699A)/DE/ OE PG [09](If required)	M.Tech Thesis [36] (CHE 699A)
	OE PG -1 [09] OE PG -2 [09]	M.Tech Thesis [09] (CHE 699A) DE PG -1 [09]*		M.Tech Thesis [27]	
		DE PG -2 [09]*			
		OE PG -3 [09]			
		OE PG -4 [09]			
		M.Tech Thesis [09]			
Total Credits	18	45	09	36	36

MINIMUM CREDIT REQUIREMENT IN MS PART FOR GRADUATION:

PG Component	:	54	Credits
Thesis	:	81	Credits

Basket - A
CHE611A [09]
CHE621A [09]
CHE631A [09]
CHE641A [09]

REMARKS:

- a) All courses to be taken with the permission of Supervisor / DUGC Convener.
- b) * DE PG 1 & 2 should be selected from Basket –A.
- c) CHE701A and CHE702A (seminar courses) are mandatory.
- d) Course credits and Thesis credits mentioned under the dual degree template are only for the M.Tech part of programme. In addition to these credits, students are required to follow and complete all their graduation requirements for their UG programme.
- e) 18 DE credits may be used from BT minimum requirements to fulfil requirements for the BT –MT dual degree programme. These will be waived from the BT programme and counted towards PG requirements.
- f) Up to 36 OE credits may be used from BT minimum requirements to fulfil requirements for the BT –MT dual degree programme. These will be waived from the BT programme and counted towards PG requirements.

AP –159
Senate / Agenda / 2015 –16 / 1st/02.9.2015 / ATR

BS/B.Tech-M.Tech (Category - B) (from the other department)

Template No. CHE-3

C O U R S E	UG Pre-Requisites		PG Component				
	Odd semester	Even semester	7 TH	8 TH	SUMMER	9 TH	10 TH
	ESO 204A [11]/ CHE 211A [09]*	CHE 331A [09]	CHE 701A [0]	CHE 702A [0]	M.Tech Thesis [09] (CHE 699A) (If required)	M.Tech Thesis [09] (CHE 699A)/ DE PG [09] (If required)	M.Tech Thesis [36] (CHE 699A)
			DE PG -1 [09], DE PG -2 [09]				
CHE 611A [09], DE PG -3 [09]							
CHE 621A [09]							
	ESO 201A [11]/ CHE 221A [09]*		CHE 631A [09]/ CHE 633A [09]			M.Tech Thesis [27] (CHE 699A)	
			M.Tech Thesis [09] (CHE 699A)				
Total Credits	18/22	09	63		09	36	36

MINIMUM CREDIT REQUIREMENT IN MT PART FOR GRADUATION:

PG Component : 54 Credits
 Thesis : 81 Credits

REMARKS:

- a) *The ESO courses may be substituted by the CHE courses only with permission of the CHEDUGC convener.
- b) CHE701A and CHE702A (seminar courses) are mandatory.
- c) All courses to be taken with the permission of Supervisor / DUGC Convener.
- d) Course credits and Thesis credits mentioned under the dual degree template are only for the M.Tech part of programme. In addition to these credits, students are required to follow and complete all their graduation requirements for their UG programme.
- e) Up to 36 OE credits may be used from the parent department's BT / BS minimum requirements To fulfil requirements for the BT –MT dual degree programme. These will be waived from the parent department's BT programme requirements and counted towards PG requirements.

DOUBLE MAJOR

Template No. CHE-4

Pre-Requisites		
C O U R S E	Odd semester	Even semester
	ESO 201A [11]	CSO 201A [11]/ CSO 202A [11]
	ESO 208A [11]	
	ESO 205A [14]	
	Mandatory CHE Courses	
	CHE 251A [09]	CHE 211A [09]
	CHE 312A [09]	CHE 221A [09]
	CHE 313A [09]	CHE 261A [06]
	CHE 352A [05]	CHE 331A [09]
	CHE 453A [11]	CHE 381A [11]
	CHE 492A [08]	CHE 391A [08]
Total Credits	51	52

TOTAL MANDATORY CREDITS FOR SECOND MAJOR IN CHEMICAL ENGINEERING: 103 Credits

REMARKS:

- a) Depending on overlap with courses contents of parent department, some equivalent CHE courses may be waived on a case-to-case basis.
- b) Up to 36 OE credits may be waived from the parent department BT / BS graduation requirements when they are used to fulfil requirements for the double major.

MINOR

Template No. CHE-5

TITLE	CHEMICAL ENGINEERING	
C O U R S E		CHE 251A [09]
		CHE 261A [09]
		CHE 313A [09]
		CHE 331A [09]
Total		36

Post Graduate Courses

Department of chemical engineering offers several core and elective courses for the students enrolled in Ph.D., M.Tech. and M.S.(Research) programmes, below given minimum course requirements for different PG programmes.

	Programme	Minimum course requirement
	Ph.D.students joining after M.Tech.	Minimum course requirement is four . Any one course from (ChE641, ChE642) and one from (ChE611, ChE621, ChE631). The other two course can be taken from the list of electives.
	Ph.D. students joining directly after B.Tech.	Minimum course requirement is eight . Three must be from the compulsory courses (ChE611, ChE621, ChE631), one from (ChE641, ChE642) and the rest four can be taken from the list of electives.
	M.Tech.	Minimum course requirement is six . Two must be taken from the compulsory courses (ChE611, ChE621, ChE631), one from (ChE641/ChE642), and the rest three can be taken from the list of electives. Student may take another course from the compulsory basket as an elective.
	M.S.	Minimum course requirement is four . Two must be taken from the compulsory courses (ChE611, ChE621, ChE631, ChE641 (or) ChE642), and two more from the list of electives. Student may take another course from the compulsory basket as an elective.

In addition to the usual courses, MS and MTech students are required to register for **zero** credit M.Tech. Seminar(ChE701) and Ph.D. students are required to register for **zero** credit Ph.D. Seminar(ChE801).

Core courses offered

Course No	Course Title
ChE611	Transport Phenomena
ChE621	Thermodynamics
ChE631	Reaction Engineering
ChE641	Mathematical Methods
ChE642	Numerical Methods
ChE701	M.Tech. Seminar
ChE801	Ph.D. Seminar

Elective courses offered

Course No.	Course Title
ChE652A	Optimization
ChE643A	Mesoscale And Continuum Simulations In Chemical Engineering
ChE663A	Convective Heat and Mass transport
ChE633A	Heterogeneous Catalysis
ChE613A	Rheology of Complex Fluids
ChE659A	Process Engineering Principles in Microfabrication
ChE677A	Introduction to Polymer Physics
ChE632A	Multiphase Reactor Design
ChE636A	Numerical simulation of fluid flow through porous media
ChE672A	Polymer Processing
ChE623A	Thermodynamics of fluids and fluid mixtures
ChE687A	Quantum Chemical Design of Electrochemical, Catalytic and Separation Engineering Materials
ChE616A	Granular Flow
ChE668A (or) ChE614A	Principles of non-Newtonian fluid mechanics (or) Introduction to hydrodynamic stability
ChE678A	Mechanics of soft materials
ChE622A	Introduction to molecular simulations
ChE664A	Electrochemical Energy Conversion and Storage
ChE684A	Introduction to Systems Biology
ChE665A	Statistical Mechanics and Kinetics for Engineers