

For award of B.Tech. degree in chemical engineering, a student is required to earn a minimum of **163 credits** by planning their overall progress according to these course selection guidelines.

CATEGORY-WISE AND SEMESTER-WISE CREDIT DISTRIBUTION

No.	Category		Credits
1.	Major Common Core	MCC	30
2.	Major Department Core	MDC	52
3.	Major Department Elective	MDE	21
4.	Experiential Learning	EL	8
5.	Research Project/ Thesis/ End-course Internships	P/T/I	12
6.	University-Wide Elective	UWE/ CCC	40*
7.	Core Common Curriculum (including CCC704)		

Total 163

Semester	Credits						
	Total	MCC	MDC	MDE	EL	P/T/I	U/C
First	20	18	0	0	2	0	0
Second	18	12	0	0	2	0	4
Third	21	0	17	0	0	0	4
Fourth	24	0	10	6	0	0	8
Fifth	23	0	16	3	0	0	4
Sixth	24	0	8	6	2	0	8
Seventh	21	0	1	6	2	6	6
Eighth	12	0	0	0	0	6	6

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* A minimum of 16 credits from each category (UWE/CCC) is compulsory.

* Guided UWE/CCCs are compulsory, other UWE/CCC slots and respective credits in semesters 3-8 are choice based.

CATEGORY-WISE COURSES**Major Common Core (MCC)**

No.	Code	Courses	L:T:P	Credits	Level	Credit Points
1.		Engineering Physics	3:1:1	5	100	22.5
2.		Engineering Mathematics – I	3:1:0	4	100	18
3.		Engineering Chemistry and Biology	2:0:0	2	100	9
4.		Introduction to Programming	3:0:1	4	100	18
5.		Basics of Electrical & Electronics Eng.	2:0:1	3	100	13.5
6.		Engineering Mathematics – II	3:1:0	4	100	18
7.		Engineering Mechanics	2:1:0	3	100	13.5
8.		Introduction to Engineering Materials	2:0:0	2	100	9
9.		Sensors and IoT Applications	2:0:1	3	100	13.5

Total 30**135**

Major Department Core (MDC)

No.	Code	Courses	L:T:P	Credits	Level	Cr. Pts.
1.	CHD23x	Material & Energy Balance *	3:0:0	3	200	15
2.	CHD23x	Chemical Eng. Thermodynamics *	3:1:0	4	200	20
3.	CHD23x	Fluid Mechanics *	3:0:0	3	200	15
4.	CHD23x	Mechanical Operations	3:0:0	3	200	15
5.	CHD23x	Data Structures	3:0:1	4	200	20
6.	CHD24x	Introduction to Chem. Engg. Software	0:0:2	2	200	10
7.	CHD24x	Heat Transfer *	3:0:0	3	200	15
8.	CHD24x	Numerical Methods	3:0:0	3	200	15
9.	CHD35x	Chemical Reaction Engineering *	3:1:0	4	300	22
10.	CHD35x	Mass Transfer *	3:1:0	4	300	22
11.	CHD35x	Artificial Intelligence & Machine Learning	3:0:1	4	300	22
12.	CHD35x	Process Dynamics & Control	3:0:0	3	300	16.5
13.	CHD36x	Transport Phenomena	3:0:0	3	300	16.5
14.	CHD36x	Chemical Technology	3:0:0	3	300	16.5
15.	CHD47x	Fluid Mechanics Laboratory	0:0:1	1	400	6
16.	CHD47x	Mechanical Operations Laboratory	0:0:1	1	400	6
17.	CHD47x	Heat Transfer Laboratory	0:0:1	1	400	6
18.	CHD47x	Mass Transfer Laboratory	0:0:1	1	400	6
19.	CHD47x	Process Dynamics & Control Laboratory	0:0:1	1	400	6
20.	CHD47x	Chemical Reaction Eng. Laboratory	0:0:1	1	400	6

Total 52**276.5**

* Courses required by external students for their degree with minors in chemical engineering.

Major Department Elective (MDE)

No.	Code	Courses	L:T:P	Credits	Level	Cr. Pts.
Pool 1 – Modelling and Simulation Specialization (12 credits)						
1.	CHD24x	Introduction to Modelling and Simulation	3:0:0	3	200	15
2.	CHD35x	Computational Fluid Dynamics	2:0:1	3	300	16.5
3.	CHD36x	Mod. & Sim. of Engineering Systems	3:0:0	3	300	16.5
4.	CHD47x	Molecular Simulation	3:0:0	3	400	18
Pool 2 – Bioenergy and Biomaterials Specialization (12 credits)						
1.	CHD24x	Industrial Pollution & Waste Management	3:0:0	3	200	15
2.	CHD35x	Waste to Biomaterials	3:0:0	3	300	16.5
3.	CHD36x	Biomass Conversion to Bioenergy	2:0:1	3	300	16.5
4.	CHD47x	Microreactor Tech. for Biofuel Production	3:0:0	3	400	18
Pool 3 – Common Pool (9 credits compulsory from this pool)						
5.	CHD24x	Advanced Chemical Engineering Thermo.	3:0:0	3	200	15
6.	CHD35x	Petroleum Refining Operations	3:0:0	3	300	16.5
7.	CHD36x	Process Equipment Design	3:0:0	3	300	16.5
8.	CHD36x	Nanocatalyst Synth. & Characterisation	3:0:0	3	300	16.5
9.	CHD47x	Process Engineering	3:0:0	3	400	18
10.	CHD47x	Process Safety	3:0:0	3	400	18
Total				21		115.5

Experiential Learning (EL)

No.	Code	Courses	L:T:P	Credits	Level	Cr. Pts.
1.		Introduction to Engineering	1:0:1	2	400	12
2.		CAD and 3D Printing	0:1:1	2	400	12
3.	CHD36x	Experiential Learning – I (Career dev.)	-	2	400	12
4.	CHD47x	Experiential Learning - II (Career dev.)	-	2	400	12
Total				8		48

Research Project/ Thesis/ End-course Internships (P/T/I)

No.	Code	Courses	L:T:P	Credits	Level	Credit Points
1.	CHD47x	Minor Project	0:0:6	6	400	36
2.	CHD48x	Major Project	0:0:6	6	400	36

Total 12 72

Computational Mechanics Cross-Domain Specialization Elective
(Common MDE by Departments of Chemical, Mechanical, Civil Engineering)

No.	Code	Courses	L:T:P	Credits
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Set 1 (6 credits)

1.	CHD35x	Finite Element Methods	2:0:1	3
2.	CHD35x	Computational Fluid Dynamics	2:0:1	3
3.	CHD36x	Mod. & Sim. of Eng. Sys. (Compulsory)	3:0:0	3

Set 2 (6 credits)

1.		Fracture Mechanics	3:0:0	3
2.		Continuum Mechanics	3:0:0	3
3.		Advanced Mechanics of Composites	3:0:0	3
4.		Opt. Meth. for Eng. Process & Design	3:0:0	3
5.		Multiphase Flows	2:0:1	3
6.	CHD47x	Molecular Simulation	3:0:0	3

Total 12

* Remaining 21-12 = 9 MDE credit requirements as per respective departments.

SEMESTER-WISE COURSES

First Semester

No.	Code	Courses	L:T:P	Type	Credits	Level	Credit Points
1.		Engineering Physics	3:1:1	MCC	5	100	22.5
2.		Engineering Mathematics – I	3:1:0	MCC	4	100	18
3.		Engineering Chemistry and Biology	2:0:0	MCC	2	100	9
4.		Introduction to Programming	3:0:1	MCC	4	100	18
5.		Basics of Electrical & Electronics Eng.	2:0:1	MCC	3	100	13.5
6.		Introduction to Engineering	1:0:1	EL	2	400	12

Total 20 93

Credits Summary

	MCC	MDC	MDE	EL	P/T/I	U/C	Total Cr. Pt.	
Sem.	18	0	0	2	0	0	20	93
Cum.	18	0	0	2	0	0	20	93

Second Semester

No.	Code	Courses	L:T:P	Type	Credits	Level	Credit Points
1.		Engineering Mathematics – II	3:1:0	MCC	4	100	18
2.		Engineering Mechanics	2:1:0	MCC	3	100	13.5
3.		Introduction to Engineering Materials	2:0:0	MCC	2	100	9
4.		Sensors and IoT Applications	2:0:1	MCC	3	100	13.5
5.		CAD and 3D Printing	0:1:1	EL	2	400	12
6.	CCC704	Env. & Sustainability (guided CCC)	3:1:0	U/C	4	200	20

Total 18 86

Credits Summary

	MCC	MDC	MDE	EL	P/T/I	U/C	Total Cr. Pt.	
Sem.	12	0	0	2	0	4	18	86
Cum.	30	0	0	4	0	4	38	179

Third Semester

No.	Code	Courses	L:T:P	Type	Credits	Level	Credit Points
1.	CHD23x	Material & Energy Balance *	3:0:0	MDC	3	200	15
2.	CHD23x	Chemical Eng. Thermodynamics *	3:1:0	MDC	4	200	20
3.	CHD23x	Fluid Mechanics *	3:0:0	MDC	3	200	15
4.	CHD23x	Mechanical Operations	3:0:0	MDC	3	200	15
5.		Data Structures & Algorithms	3:0:1	MDC	4	200	20
6.		UWE/CCC		U/C	4	100	18

Total 21 103

Credits Summary

	MCC	MDC	MDE	EL	P/T/I	U/C	Total Cr. Pt.	
Sem.	0	17	0	0	0	4	21	103
Cum.	30	17	0	4	0	8	59	282

Fourth Semester

No.	Code	Courses	L:T:P	Type	Credits	Level	Credit Points
1.	CHD24x	Introduction to Chem. Engg. Software	0:0:2	MDC	2	200	10
2.	CHD24x	Heat Transfer *	3:0:0	MDC	3	200	15
3.	CHD24x	Numerical Methods	3:0:0	MDC	3	200	15
4.	CHD24x	Elective from Pool 1/2	3:0:0	MDE	3	200	15
5.	CHD24x	Elective from Pool 3	3:0:0	MDE	3	200	15
6.	CHD44x	Fluid Mechanics Laboratory	0:0:1	MDC	1	400	6
7.	CHD44x	Mechanical Operations Laboratory	0:0:1	MDC	1	400	6
8.	MAT161	Applied Linear Algebra (guided UWE)	3:1:0	U/C	4	200	20
9.		UWE/CCC		U/C	4	100	18

Total 24 120

Credits Summary

	MCC	MDC	MDE	EL	P/T/I	U/C	Total Cr. Pt.	
Sem.	0	10	6	0	0	8	24	120
Cum.	30	27	6	4	0	16	83	402

Fifth Semester

No.	Code	Courses	L:T:P	Type	Credits	Level	Credit Points
1.	CHD35x	Chemical Reaction Engineering *	3:1:0	MDC	4	300	22
2.	CHD35x	Mass Transfer *	3:1:0	MDC	4	300	22
3.		Artificial Intelligence & Machine Learning	3:0:1	MDC	4	300	22
4.	CHD35x	Process Dynamics & Control	3:0:0	MDC	3	300	16.5
6.	CHD35x	Elective from Pool 1/2/3	3:0:0	MDE	3	300	16.5
7.	CHD45x	Heat Transfer Laboratory	0:0:1	MDC	1	400	6
8.		UWE/CCC		U/C	4	100	18
Total					23		123

Credits Summary

	MCC	MDC	MDE	EL	P/T/I	U/C	Total Cr. Pt.	
Sem.	0	16	3	0	0	4	23	123
Cum.	30	43	9	4	0	20	106	525

Sixth Semester

No.	Code	Courses	L:T:P	Type	Credits	Level	Credit Points
1.	CHD36x	Transport Phenomena	3:0:0	MDC	3	300	16.5
2.	CHD36x	Elective from Pool 1/2	3:0:0	MDE	3	300	16.5
3.	CHD36x	Elective from Pool 3	3:0:0	MDE	3	300	16.5
4.	CHD36x	Chemical Technology	3:0:0	MDC	3	300	16.5
5.	CHD46x	Mass Transfer Laboratory	0:0:1	MDC	1	400	6
6.	CHD46x	Process Dynamics & Control Laboratory	0:0:1	MDC	1	400	6
7.	CHD46x	Experiential Learning - I	-	EL	2	400	12
8.	EWE101	Natural Gas Engineering (guided UWE)	3:0:0	U/C	3	200	15
9.		UWE/CCC		U/C	5	200	25

Total 24 130

Credits Summary

	MCC	MDC	MDE	EL	P/T/I	U/C	Total Cr. Pt.	
Sem.	0	8	6	2	0	8	24	130
Cum.	30	51	15	6	0	28	130	655

Seventh Semester

No.	Code	Courses	L:T:P	Type	Credits	Level	Credit Points
1.	CHD47x	Chemical Reaction Eng. Laboratory	0:0:1	MDC	1	400	6
2.	CHD47x	Elective from Pool 1/2	3:0:0	MDE	3	400	18
3.	CHD47x	Elective from Pool 3	3:0:0	MDE	3	400	18
4.	CHD47x	Experiential Learning - II	-	EL	2	400	12
5.	CHD47x	Minor Project	0:0:6	P/T/I	6	400	36
6.		UWE/CCC		U/C	6	200	30

Total 21 120

Credits Summary

	MCC	MDC	MDE	EL	P/T/I	U/C	Total Cr. Pt.	
Sem.	0	1	6	2	6	6	21	120
Cum.	30	52	21	8	6	34	151	775

Eighth Semester

No.	Code	Courses	L:T:P	Type	Credits	Level	Credit Points
1.	CHD48x	Major Project	0:0:6	P/T/I	6	400	36
2.		UWE/CCC		U/C	6	200	30
Total					12		66

Credits Summary

	MCC	MDC	MDE	EL	P/T/I	U/C	Total Cr. Pt.	
Sem.	0	0	0	0	6	6	12	66
Cum.	30	52	21	8	12	40	163	841