

COURSE STRUCTURES FOR UG PROGRAMME

Department of Chemical Engineering and Technology

B.Tech. Course Structure (without Minor or Second Major 2025-26 onwards)

Category	B.Tech. with Internship Program Components	Proposed	Recommended	
			Minimum	Maximum
HLM	Humanities, Social Science, Language and Management	11	10	--
IS	Institute Science	24	22	--
IE	Institute Engineering	17	15	--
EP	Engineering Drawing (Manual and Computer Aided), Manufacturing Practices, and Practice courses of Department/ School	8	8	--
^o DC+DE	Department/Program Core +Elective	75	68	--
OE	Open Electives	6	6	--
Indl/RI/SUE	Industrial/research internship/Start-up or Entrepreneurship	15	15	--
DP	Exploratory project	3	3	3
^æ Total		159	^æ 147	^æ 165
*SP	*Stream Projects for B.Tech. Honors	10	10	10
		169	^æ 157	^æ 175

^oDC+DE: The Department or Program Core (DC) should typically be between 50 to 70% of the total DC+DE credits

^æ Shows the minimum and the maximum credit limits for a B.Tech. degree.

B.Tech. Course Structure for Chemical Engineering (2025-2026 onwards) without minor or Second Major

UG-CRC Code	Course Code	Course Name	L–T–P			Credits
Discipline_Name : 4-Year B.Tech. I-Semester						
	HLM101	Universal Human Values	2	0	0	2
	PE101	Elementary Physical Education	0	1	3	2.5
	CP101	Creative Practices #	0	1	3	2.5
		Total	2	2	6	7
	HLM102	English	2	0	0	2
		Total	4	2	6	9
#Creative Practices course to be announced by Dean Academic Office						
*Basic English course to be taken by student as recommended after Diagnostic Test						

Note: 1. Per semester load should not exceed 22 credits.

2. It is recommended that departments limit the maximum total credits to 161. Otherwise, because of the extra load the students may avoid taking a Minor discipline. The calculation of total credits excludes Basic English, Creative Practice, and Elementary Physical Education.

Chemical Engineering: 4-Year B.Tech. I-Semester						
	PHY101	Physics - I: Classical, Relativistic & Quantum Mechanics	3	1	2	5
	CY101	Chemistry – I	2	1	2	4
	MA101	Engineering Mathematics – I	3	1	0	4
	CHO101	Process Calculations	2	1	0	3
	HLM101	Universal Human Values	2	0	0	2
	ME105	Manufacturing Practice – I	0	0	3	1.5

UG-CRC Code	Course Code	Course Name	L-T-P			Credits
		Total	12	4	7	19.5
L: Lecture Hours, T: Tutorials Hours, P: Practical Or Laboratory Hours, C: Credits						
Chemical Engineering: 4-Year B.Tech. II-Semester						
	MA102	Engineering Mathematics – II	3	1	0	4
	EO101	Fundamentals of Electrical Engineering	3	1	0	4
	CSO101	Computer Programing	3	1	2	5
	ME104	Engineering Drawing	1	0	3	2.5
	ME106	Manufacturing Practices – II	0	0	3	1.5
	CHE101	Chemical Engineering Thermodynamics	3	1	0	4
		Total	13	4	8	21
# Students can study one HLM course from the bouquet of HLM choices given.						
Chemical Engineering: 4-Year B.Tech. III-Semester						
	MA201	Mathematical Methods	3	1	0	4
	CHO201	Fluid Mechanics	3	1	0	4
	MO201	Material Science	3	0	0	3
	CHE201	Fluid Particle Mechanics	2	0	0	2
	CHE202	Chemical Reaction Engineering	3	0	0	3
	CHE203	Heat Transfer Operations	3	0	0	3
	CHE291	Exploratory Project	0	0	6	3
		Total	17	2	6	22
# CHO102 and CHO103 will be offered for other departments in even semester						
Chemical Engineering: 4-Year B.Tech. IV-Semester**						
	MA203	Numerical Techniques	3	0	0	3
	CHE204	Mass Transfer Operations I	3	0	0	3
	CHE205	Process Dynamics & Control	3	0	0	3
	CHE221	Industrial Pollution and Control	3	0	0	3
	CHE222	Computational Chemical Engineering	1	0	2	2
	CHE281	Fluid Particle Mechanics Lab	0	0	2	1
	CHE282	Chemical Reaction Engineering Lab	0	0	2	1
	CHO202	Heat and Mass Transfer (For Other Departments)	0	0	0	0
	DE - 1	Departmental Elective (DE) – 1	3	0	0	3
	HLM	HLM-2	2	1	0	3
		Total	16	0	6	22
**CHO202 Heat and Mass Transfer for other departments as IE						
Pool for DE-1						
	CHE231	Biochemical Engineering	3	0	0	3
	CHE241	Fluidization Engineering	3	0	0	3
	CHE251	Safety and Hazard Analysis	3	0	0	3
	CHE232	Advanced Chemical Reaction Engineering	3	0	0	3
Chemical Engineering: 4-Year B.Tech. V-Semester						
	CHE311	Mass Transfer Operations II	3	0	0	3
	CHE312	Transport Phenomena	3	0	0	3
	CHE313	Process Instrumentation	2	0	0	2
	CHE314	Energy Resource Utilization	3	0	0	3
	CHE381	Heat Transfer Operations Lab	0	0	2	1
	CHE382	Instrumentation and Process Control Lab	0	0	2	1
	CHE383	Industrial Pollution and Control Lab	0	0	2	1
	CHE384	Energy Resource Utilization Lab	0	0	2	1
	OE - 1	Open Elective – 1	3	0	0	3
		Total	14	0	8	18
Chemical Engineering: 4-Year B.Tech. VI-Semester						
II.CHE391/ RI.CHE392/ SE.CHE393		Internship	0	0	30	15
	DE - 2	DE2 (SWAYAM/NPTEL)	3	0	0	3
		Total	3	0	30	18

UG-CRC Code	Course Code	Course Name	L–T–P			Credits
Chemical Engineering: 4-Year B.Tech. VII-Semester						
	CHE481	Mass Transfer Operations Lab	0	0	2	1
	CHE401	Chemical Technology	2	0	0	2
	CHE482	Chemical Technology & Instrumental Analysis Lab	0	0	2	1
	DE - 3	Departmental Elective (DE) – 3	3	0	0	3
	DE - 4	Departmental Elective (DE) – 4	3	0	0	3
	DE - 4	Departmental Elective (DE) – 5	3	0	0	3
	OE - 2	Open Elective – 2	3	0	0	3
	HLM	HLM-3	3	0	0	3
		Total	17	0	4	19
		Stream Project	0	0	10	5
		Total	17	0	14	24
Chemical Engineering: 4-Year B.Tech. VIII-Semester						
	CHE421	Process Equipment Design	2	0	2	3
	CHE422	Process Plant Design & Economics	2	0	2	3
	DE - 6	Departmental Elective (DE) – 6	3	0	0	3
	DE - 7	Departmental Elective (DE) – 7	3	0	0	3
	DE - 8	Departmental Elective (DE) – 8	3	0	0	3
HLM	HLM	HLM-4	3	0	0	3
		Total	16	0	4	18
		Stream Project	0	0	10	5
		Total	16	0	14	23
Pool for DE-3, DE-4, and DE-5						
	CHE551	Solar Energy Engineering	3	0	0	3
	CHE531	Heterogeneous Catalysis	3	0	0	3
	CHE541	New Separation Processes	3	0	0	3
	CHE441	Petroleum Refinery Engineering	3	0	0	3
	CHE532	Kinetics of Complex Reactions	3	0	0	3
	CHE533	Corrosion Engineering	3	0	0	3
	CHE502	Chemical Process Design	3	0	0	3
	CHE542	Membrane Separation Processes	3	0	0	3
	CHE534	Applied Biochemical Engineering	3	0	0	3
	CHE543	Advanced Fluidization Engineering	3	0	0	3
	CHE552	Renewable Energy Technology	3	0	0	3
	CHE553	Air Pollution Control Technology	3	0	0	3
	CHE561	Polymer Rheology	3	0	0	3
	CHE562	Fundamentals of Microfluidics	3	0	0	3
	CHE563	Molecular Simulations	3	0	0	3
	CY441	Waste Management Technology	3	0	0	3
	CY442	Green Chemistry	3	0	0	3
	CY511	Bioinspired Energy Conversion	3	0	0	3
	CY532	Statistical Thermodynamics	3	0	0	3
Pool for DE-6, DE-7, and DE-8						
	CHE503	Advanced Process Dynamics and Control	3	0	0	3
	CHE564	Modeling and Simulation	3	0	0	3
	CHE544	Multi Component Separation	3	0	0	3
	CHE554	Fuel Cell Technology	3	0	0	3
	CHE555	Solid Waste Management and Utilization	3	0	0	3
	CHE504	Chemical Reactor Design and Analysis	3	0	0	3
	CHE565	Nanoscience and Technology	3	0	0	3
	CHE556	Water Pollution Control Technology	3	0	0	3
	CHE521	Polymer Science & Technology	3	0	0	3
	CHE566	Computational Fluid Dynamics	3	0	0	3
	CHE535	Electrochemical Engineering	3	0	0	3
	CHE567	Artificial Intelligence in Chemical Engineering	3	0	0	3
	CHE 557	Reliability and Risk Analysis in Process Industries	3	0	0	3
	CHE 571	Instrumental Analysis and Analytical Techniques	3	0	0	3
	CHE 572	Research Methodology	3	0	0	3
	CHE545	Multi-phase Flow	3	0	0	3
	CHE 536	Design and Analysis of Bioreactor	3	0	0	3
	CY438	Electrochemistry and Surface Phenomena	3	0	0	3
	CY447	Instrumental Methods of Chemical Analysis	3	0	0	3
	CY449	Environmental Impact and Risk Assessment	3	0	0	3