

**B. TECH. (CHEMICAL ENGINEERING)  
COMPONENT WISE DISTRIBUTION**

<b>Main Curriculum Components</b>	<b>Sub Components</b>	<b>Approved Credits for B. Tech.</b>	<b>Approved Credits Range</b>	<b>Proposed Credits for B. Tech. by Department</b>	<b>Proposed Credits Range</b>
<b>Institute Core Course</b>	HSSC	5	52-58	5	53
	HSSEC	6		6	
	MC	3		3	
	BSC	12-20		20	
	ESC	8-20		8	
	DSC	4		4	
	ESSC	3		3	
	TM	4		4	
<b>Program Core Course</b>	CCCC	40-48	87-91	47	91
	AI/ML	2		2	
	Engg. Analysis and design (design thinking based project)/Industry Oriented Problem Solving/ Lab based Project/ Practical Problem/ Case study	4		4	
	Technical Communication	2		2	
	BTP/Entrepreneurship/ Project-based internship/PEC	6-10		8	
	PEC	22-26		22	
	TEB	6-8		6	
	OEC	9-12		9-12	
	CORE	2	2	2	2
	<b>Total</b>	<b>150-160</b>		<b>155-158</b>	
	MSC/DHC	<b>18/20</b>		<b>18/20</b>	
	<b>Grand Total</b>			<b>173/178</b>	

**DEPARTMENT OF CHEMICAL ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

**Program Code** : 112      **B. Tech. (Chemical Engineering)**  
**Department** : CH      **Chemical Engineering**

**Teaching Scheme**

<b>Year</b>	<b>Credits in Autumn Semester</b>	<b>Credits in Spring Semester</b>	<b>Credits (Year – wise)</b>
1	23	21	44
2	23/24	21/22	44/46
3	21/22	22	43/44
4	12	12	24
<b>Grand Total</b>			<b>155/158</b>
<b>Total with MSC/DHC</b>	<b>With addition 18-20 credits</b>		<b>173/178</b>

<b>Non-Credit Elements (NCE)</b>	<b>Components</b>	<b>Maximum Units</b>	<b>Minimum Units</b>	<b>Comments</b>
	<b>Discipline (DIS)</b>	<b>16</b>	<b>8</b>	To be evaluated by DoSW
	<b>NCC/NSS/NSO</b>	<b>8</b>	<b>4</b>	To be evaluated by DoSW
	<b>Internship (INT)</b>	<b>24</b>	<b>8</b>	1-week internship= 1 unit (to be coordinated by the deptt./Centres/School)
	<b>Participation in professional development programs by Industry experts/ field experts (PPD-1 &amp; PPD-2)</b>	<b>8</b>	<b>4</b>	To be coordinated by the departments/Centres/school (2 <sup>nd</sup> & 3 <sup>rd</sup> Years)
<b>Minimum non-credit units to be earned: 24</b>				









**List of Program Elective Courses**

Teaching Scheme					Contact Hours/Week			Exam. Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	CHL-323	Transport Phenomena	PEC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
2.	CHL-324	Industrial Pollution Abatement	PEC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
3.	CHL-326	Fluidization Engineering	PEC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
4.	CHL-327	Petroleum Refining	PEC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
5.	CHL-328	Petrochemicals	PEC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
6.	CHL-329	Fertilizer Technology	PEC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
7.	CHL-511	Process Integration	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	CHL-513	Biochemical Engineering	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
9.	CHL-515	Computational Fluid Dynamics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
10	CHL-517	Optimization of Chemical Processes	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
11	CHL-510	Advanced Process Control	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
12	CHL-512	Solid and Hazardous Waste Management	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
13	CHL-514	Pollution Control Systems	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
14	CHL-516	Kinetics of Polymerization	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
15	CHL-518	Waste to Energy Conversion	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
16	CHL-520	Oil and Gas Transport	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
17	CHL-522	Nanotechnology in Chemical Engineering	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
18	CHL-524	Microfluidics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
19	CHL-526	Supercritical Fluids: Theory and Applications	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
20	CHL-528	Introduction to Granular Rheology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
21	CHL-530	Drug Delivery	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
22	CHL-532	Colloids and Interfacial Science	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
23	CHL-534	Novel Separation Techniques	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
24	CHL-536	Design of Experiments and Parameter Estimation	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
25	CHL-538	Industrial Safety and Hazard Management	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
26	CHL-540	Multiphase Flow	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-



**List of Talent Enhancement Basket Courses**

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)								
S. No.	Course Code	Course Title	Area	Cr.	L	T	P	Th.	Pr.	C	W	S	PRS	MTE	E	T	E	PRE
<b>TEB-A</b>																		
1	CHT-101	Advanced Characterization Techniques-I	TEB	3	2	0	2	3	0	10-25	25	15-25	30-40	-				
2	CHT-102	Advanced Characterization Techniques-II	TEB	3	2	0	2	3	0	10-25	25	15-25	30-40	-				
<b>TEB-B</b>																		
1	CHT-103	Process Modeling and Simulations-I	TEB	3	2	0	2	3	0	10-25	25	15-25	30-40	-				
2	CHT-104	Process Modeling and Simulations-II	TEB	3	2	0	2	3	0	10-25	25	15-25	30-40	-				

**List of OEC course**

SN	Code	Course title	Semester	Credits
1	CHO-101	Computational Fluid Dynamics	Autumn	4

### Minor Specialization Courses

<b>S.No.</b>	<b>Code</b>	<b>Course title</b>	<b>Semester</b>	<b>Credits</b>
1	CHC-102	Chemical Process Calculations	Spring	4
2	CHC-104	Fluid Mechanics	Spring	4
3	CHC-201	Heat Transfer	Autumn	4
4	CHC-203	Chemical Engineering Thermodynamics	Autumn	4
5	CHC-202	Chemical Reaction Engineering	Spring	4
6	CHC-204	Mass Transfer	Spring	4
7	CHC-305	Process Equipment Design	Autumn	4

### Departmental Honours Courses

S.No.	Code	Course title	Credits
1	CHL-511	Process Integration	4
2	CHL-513	Biochemical Engineering	4
3	CHL-515	Computational Fluid Dynamics	4
4	CHL-517	Optimization of Chemical Processes	4
5	CHL-510	Advanced Process Control	4
6	CHL-512	Solid and Hazardous Waste Management	4
7	CHL-514	Pollution Control Systems	4
8	CHL-516	Kinetics of Polymerization	4
9	CHL-518	Waste to Energy Conversion	4
10	CHL-520	Oil and Gas Transport	4
11	CHL-522	Nanotechnology in Chemical Engineering	4
12	CHL-524	Microfluidics	4
13	CHL-526	Supercritical Fluids: Theory and Applications	4
14	CHL-528	Introduction to Granular Rheology	4
15	CHL-530	Drug Delivery	4
16	CHL-532	Colloids and Interfacial Science	4
17	CHL-534	Novel Separation Techniques	4
18	CHL-536	Design of Experiments and Parameter Estimation	4
19	CHL-538	Industrial Safety and Hazard Management	4
20	CHL-540	Multiphase Flow	4