

Chemical Engineering Dual Degree Courses & Credits Distribution

Credits Distribution:

UG

Category	Total Credits
Basic Sciences	22
Engineering Arts and Science	18
Humanities and Social Sciences	15
Programme Linked Engineering Arts & Science	7
Department Core	63
Department Elective	9
Open Category	3
TOTAL	137

PG

Category	Total Credits
Program Core	33
Program Elective	12
Open Elective	3
TOTAL	48

Department Core (DC):

S. No.	Course Title	Credits
1. (L)	Transport Phenomena	(3-1-0) 4
2. (L)	Material and Energy Balance	(2-2-0) 4
3. (L)	Chemical Engineering Thermodynamics	(3-1-0) 4
4. (L)	Chemical Process Technology	(3-1-0) 4
5. (L)	Chemical Reaction Engineering I	(3-1-0) 4
6. (L)	Chemical Reaction Engineering II	(3-0-0) 3
7. (L)	Fluid Mechanics for Chemical Engineers	(3-1-0) 4
8. (L)	Heat Transfer	(3-1-0) 4
9. (L)	Mass Transfer I	(3-0-0) 3
10. (L)	Mass Transfer II	(3-1-0) 4
11. (L)	Fluid-Particle Mechanics	(3-1-0) 4
12. (L)	Process Dynamics and Control	(3-1-0) 4
13. (L/P)	Numerical Methods in Chemical Engineering	(3-0-2) 4
14. (L)	Introduction to Industrial Biotechnology	(3-0-0) 3
15. (L)	Introduction to Chemical Engineering Materials	(3-0-0) 3
16. (P/L)	Instrumentation and Automation	(1-0-3) 2.5
17. (P)	Chemical Engineering Laboratory I	(0-0-3) 1.5
18. (P)	Chemical Engineering Laboratory II	(0-0-3) 1.5
19. (P)	Chemical Engineering Laboratory III	(0-0-3) 1.5
	Total Core Credits	63

Program Core (PC):

S. No.	Course No.	Course Title	Credits
1	CLL703	PROCESS ENGINEERING	(3-0-0) 3
2	CLL731	ADVANCED TRANSPORT PHENOMENA	(3-0-0) 3
3	CLL733	INDUSTRIAL MULTIPHASE REACTORS	(3-0-0) 3
4	CLD871	MINOR PROJECT	(0-0-8) 4
5	CLD881	MAJOR PROJECT PART-1	(0-0-16)8
6	CLD882	MAJOR PROJECT PART-2	(0-0-24)12
TOTAL CREDITS			33

DEPARTMENT ELECTIVE (DE):

S. No.	Course Number	Course Title	Credits
1.	CLL 133	Powder Processing and Technology	(3-0-0) 3
2.	CLL 475	Safety and Hazards in Process Industries	(3-0-0) 3
3.	CLL 477	Materials of Construction	(3-0-0) 3
4.	CLL 296	Nano-engineering of Soft Materials	(3-0-0) 3
5.	CLL 735	Design of Multicomponent Separation Processes	(3-0-0) 3
6.	CLL 390	Process Utilities and Pipeline Design	(3-0-0) 3
7.	CLL 724	Environmental Engineering and Waste Management	(3-0-0) 3
8.	CLL 727	Heterogeneous Catalysis and Catalytic Reactors	(3-0-0) 3
9.	CLL 743	Petrochemicals Technology	(3-0-0) 3
10.	CLL 766	Interfacial Engineering	(3-0-0) 3
11.	CLL 768	Fundamentals of Computational Fluid Dynamics	(2-0-2) 3
12.	CLL 769	Applications of Computational Fluid Dynamics	(2-0-2) 3
13.	CLL 781	Process Operations Scheduling	(3-0-0) 3
14.	CLL 782	Process Optimization	(3-0-0) 3
15.	CLL 780	Bioprocessing and Bioseparations	(3-0-0) 3
16.	CLL 767	Structures and Properties of Polymers	(3-0-0) 3
17.	CLL 793	Membrane Science and Engineering	(3-0-0) 3
18.	CLL 794	Petroleum Refinery Engineering	(3-0-0) 3
19.	CLL 786	Fine Chemicals Technology	(3-0-0) 3
20.	CLL761	Chemical Engineering Mathematics	(3-0-0) 3
21.	CLL707	Population Balance Modeling	(3-0-0) 3
22.	CLL 762	Advanced Computational Techniques in Chemical Engineering	(2-0-2) 3
23.	CLL 402	Process Plant Design	(3-0-0) 3
24.	CLL 792	Chemical Product Development and Commercialization	(3-0-0) 3
25.	CLL 720	Principles of Electrochemical Engineering	(3-0-0) 3
26.	CLL 721	Electrochemical Methods	(3-0-0) 3
27.	CLL 722	Electrochemical Conversion and Storage Devices	(3-0-0) 3
28.	CLL 723	Hydrogen Energy and Fuel Cell Technology	(3-0-0) 3
29.	CLL 705	Petroleum Reservoir Engineering	(3-0-0) 3
30.	CLL 706	Petroleum Production Engineering	(3-0-0) 3
31.	CLL 728	Biomass Conversion and Utilization	(3-0-0) 3
32.	CLL 771	Introduction to Complex Fluids	(3-0-0) 3
33.	CLL 772	Transport Phenomena in Complex Fluids	(3-0-0) 3
34.	CLL 773	Thermodynamics of Complex Fluids	(3-0-0) 3

35.	CLL 774	Simulation Techniques for Complex Fluids	(3-0-0) 3
36.	CLL 775	Polymerization Process Modeling	(3-0-0) 3
37.	CLL 776	Granular Materials	(3-0-0) 3
38.	CLL 777	Complex Fluids Technology	(3-0-0) 3
39.	CLL 726	Molecular Modeling of Catalytic Reactions	(3-0-0) 3
40.	CLL 734	Process Intensification and Novel Reactors	(3-0-0) 3
41.	CLL 833	Experimental Characterization of Multiphase Reactors	(3-0-0) 3
42.	CLL 742	Experimental Characterization of BioMacromolecules	(3-0-0) 3
43.	CLL 791	Chemical Product and Process Integration	(3-0-0) 3
44.	CLL 778	Interfacial Behaviour and Transport of Biomolecules	(3-0-0) 3
45.	CLL 779	Molecular Biotechnology and in-vitro Diagnostics	(3-0-0) 3
46.	CLL 783	Advanced Process Control	(3-0-0) 3
47.	CLL 784	Process Modeling and Simulation	(3-0-0) 3
48.	CLL 785	Evolutionary Optimization	(3-0-0) 3
49.	CLL 725	Air Pollution Control Engineering	(3-0-0) 3
50.	CLL 730	Structure, Transport and Reactions in BioNano Systems	(3-0-0) 3
51.	CLL 732	Advanced Chemical Engineering Thermodynamics	(3-0-0) 3
52.	CLL 798	Selected Topics in Chemical Engineering - I	(3-0-0) 3
53.	CLL 799	Selected Topics in Chemical Engineering - II	(3-0-0) 3
54.	CLD 412	Major Project in Energy and Environment	(0-0-10) 5
55.	CLD 413	Major Project in Complex Fluids	(0-0-10) 5
56.	CLD 414	Major Project in Process Engineering, Modeling and Optimization	(0-0-10) 5
57.	CLD 415	Major Project in Biopharmaceuticals and Fine Chemicals	(0-0-10) 5
58.	CLV 796	Current Topics in Chemical Engineering	(1-0-0) 1
59.	CLV 797	Recent Advances in Chemical Engineering	(2-0-0) 2

PROGRAM ELECTIVE (PE):

S. No.	Course No.	Course Title	Credits
1	CLL 705	Petroleum Reservoir Engineering	(3-0-0) 3
2	CLL 706	Petroleum Production Engineering	(3-0-0) 3
3	CLL 707	Population Balance Modeling	(3-0-0) 3
4	CLL 720	Principles of Electrochemical Engineering	(3-0-0) 3
5	CLL 721	Electrochemical Methods	(3-0-0) 3
6	CLL 722	Electrochemical Conversion and Storage Devices	(3-0-0) 3
7	CLL 723	Hydrogen Energy and Fuel Cell Technology	(3-0-0) 3
8	CLL 724	Environmental Engineering and Waste Management	(3-0-0) 3
9	CLL 725	Air Pollution Control Engineering	(3-0-0) 3
10	CLL 726	Molecular Modeling of Catalytic Reactions	(3-0-0) 3
11	CLL 727	Heterogeneous Catalysis and Catalytic Reactors	(3-0-0) 3
12	CLL 728	Biomass Conversion and Utilization	(3-0-0) 3
13	CLL 730	Structure, Transport and Reactions in BioNano Systems	(3-0-0) 3
14	CLL 732	Advanced Chemical Engineering Thermodynamics	(3-0-0) 3
15	CLL 734	Process Intensification and Novel Reactors	(3-0-0) 3

16	CLL 735	Design of Multicomponent Separation Processes	(3-0-0) 3
17	CLL 742	Experimental Characterization of BioMacromolecules	(3-0-0) 3
18	CLL 743	Petrochemicals Technology	(3-0-0) 3
19	CLL 786	Fine Chemicals Technology	(3-0-0) 3
20	CLL 761	Chemical Engineering Mathematics	(3-0-0) 3
21	CLL 762	Advanced Computational Techniques in Chemical Engineering	(2-0-2) 3
22	CLL 766	Interfacial Engineering	(3-0-0) 3
23	CLL 767	Structures and Properties of Polymers	(3-0-0) 3
24	CLL 768	Fundamentals of Computational Fluid Dynamics	(2-0-2) 3
25	CLL 769	Applications of Computational Fluid Dynamics	(2-0-2) 3
26	CLL 771	Introduction to Complex Fluids	(3-0-0) 3
27	CLL 772	Transport Phenomena in Complex Fluids	(3-0-0) 3
28	CLL 773	Thermodynamics of Complex Fluids	(3-0-0) 3
29	CLL 774	Simulation Techniques for Complex Fluids	(3-0-0) 3
30	CLL 775	Polymerization Process Modeling	(3-0-0) 3
31	CLL 776	Granular Materials	(3-0-0) 3
32	CLL 777	Complex Fluids Technology	(3-0-0) 3
33	CLL 778	Interfacial Behaviour and Transport of Biomolecules	(3-0-0) 3
34	CLL 779	Molecular Biotechnology and in-vitro Diagnostics	(3-0-0) 3
35	CLL 780	Bioprocessing and Bioseparations	(3-0-0) 3
36	CLL 781	Process Operations Scheduling	(3-0-0) 3
37	CLL 782	Process Optimization	(3-0-0) 3
38	CLL 783	Advanced Process Control	(3-0-0) 3
39	CLL 784	Process Modeling and Simulation	(3-0-0) 3
40	CLL 785	Evolutionary Optimization	(3-0-0) 3
41	CLL 791	Chemical Product and Process Integration	(3-0-0) 3
42	CLL 792	Chemical Product Development and Commercialization	(3-0-0) 3
43	CLL 793	Membrane Science and Engineering	(3-0-0) 3
44	CLL 794	Petroleum Refinery Engineering	(3-0-0) 3
45	CLL 798	Selected Topics in Chemical Engineering - I	(3-0-0) 3
46	CLL 799	Selected Topics in Chemical Engineering - II	(3-0-0) 3
47	CLL 833	Experimental Characterization of Multiphase Reactors	(3-0-0) 3
48	CLV 796	Current Topics in Chemical Engineering	(1-0-0) 1
49	CLV 797	Recent Advances in Chemical Engineering	(2-0-0) 2

Semester	Course-1	Course-2	Course-3	Course-4	Course-5	Course-6	Course-7	Course-8	Course-9	L	T	P	Credits	Non-Graded Units	Contact Hou
I	ELL100	MCP100	PYL100	MTL100	PYP100	MCP101	NIN100	NEN100	NLN100						
	Introduction to Electrical	Introduction to Engineering	Electromagnetic Waves and	Calculus	Physics Laboratory	Product Realization	Introduction to Engineering	Professional Ethics and Social	Language and Writing Skills-1						
	3 0 2 4	0.5 0 3 2	3 0 0 3	3 1 0 4	0 0 4 2	0 0 4 2	0 0 2 1	0 0 1 0.5	0 0 2 1	9.5	1	13	17.0	2.5	28.5
II	APL100	COL100	CML100	MTL101	CMP100			NEN100	NLN100						
	Engineering Mechanics	Introduction to Computer	Introduction to Chemistry	Linear Algebra and Differential	Chemistry Laboratory			Professional Ethics and Social	Language and Writing Skills-2						
	3 1 0 4	3 0 2 4	3 0 0 3	3 1 0 4	0 0 4 2			0 0 1 0.5	0 0 2 1	12	2	6	17.0	1.5	23.0
Note: Courses 1-6 above are attended in the given order by half of all first year students. The other half of First year students attend the Courses 1-6 of II semester first.															
III	CLL110	CLL111	CLL113	CML103	HUL2XX		CLN101								
	Transport	Material and	Numerical	Applied			Introduction to								
	3 1 0 4	2 2 0 4	3 0 2 4	3 0 0 3	3 1 0 4		0 0 2 1			14	4	2	19.0	1	22.0
IV	CLL121	CLL122	CLL231	CLL251	SBL100	APL102									
	Chemical	Chemical	Fluid Mechanics	Heat Transfer for	Introductory	Introduction to									
	3 1 0 4	3 1 0 4	3 1 0 4	3 1 0 4	3 0 2 4	3 0 2 4				18	4	4	24.0	0	26.0
V	CLL252	CLL222	CLL331	CLL141	CLL261	CVL100	CLP301								
	Mass Transfer I	Chemical	Fluid-Particle	Introduction to	Process Dynamics	Environmental	Chemical								
	3 0 0 3	3 0 0 3	3 1 0 4	3 0 0 3	3 1 0 4	2 0 0 2	0 0 3 1.5			17	2	3	20.5	0	22.0
VI	CLL352	DE 1	CLL271	CLL371	CLL361	HUL2XX	CLP302								
	Mass Transfer II		Introduction to	Chemical Process	Instrumentation		Chemical								
	3 1 0 4	3 0 0 3	3 0 0 3	3 1 0 4	1 0 3 2.5	3 1 0 4	0 0 3 1.5			16	3	6	22.0	0	25.0
VII	DE 2	PE 1	PE 2	CLP303	CLL703	HUL2XX	OC 1								
				Engineering Laboratory III	Proc. Engg										
	3 0 0 3	3 0 0 3	3 0 0 3	0 0 3 1.5	3 0 0 3	3 1 0 4	3 0 0 3			18	1	3	20.5	0	22.0
VIII	PE 3	DE 3	HUL3XX	CLL731	CLL733	CLD871									
				Adv Trans Pheno	Ind Multiph Reac	Minor Project									
	3 0 0 3	3 0 0 3	3 0 0 3	3 0 0 3	3 0 0 3	0 0 8 4				15	0	8	19.0	0	23.0
Summer	CLD872														
IX		PE 4	OE 1												
	Major Project I														
	0 0 16 8	3 0 0 3	3 0 0 3							6.0	0	16	14.0	0	22.0
X	CLD873														
	Major Project II														
	0 0 24 12									0.0	0	24	12.0	0	24.0