

BOS

R21

Minutes

Minutes of the BOS meeting

1. The chairman greeted all the BOS members.
2. The chairman emphasized broad objectives of the proposed changes in the course structure of B.Tech Chemical Engineering program.
3. The chairmen also elucidated in detail the suggestions and remarks communicated from various stakeholders.
4. The members of the BOS painstakingly observed the proposals of Department of Chemical Engineering in the light of suggestions made by experts and recommended a new course structure for B.Tech Chemical Engineering program.

After the discussion it is resolved to:

1. Propose and approve course structure for all 4 years of B.Tech. Programme in Chemical Engineering (Appendix-I).
2. Propose and approve detailed syllabus for the 4 year of B.Tech. Programme in Chemical Engineering with effect from the academic year 2021-22. The proposed structure and syllabus are applicable for 2021 admitted batch onwards.
3. Stakeholder's feedback is collected, analyzed and given paramount priority while designing the curriculum and their suggestions are implemented.
4. **The curriculum follows choice-based credit system.**
5. Major restructuring has taken place in the curriculum towards Project based learning with inclusion of Intra disciplinary, Inter-departmental and Societal centric and industry related projects.
6. **Major reformation has taken place in the curriculum by offering new courses and electives such as Programming for Problem Solving, Data Structures, Engineering Chemistry, Probability and Statistics, Matlab Programming for Chemical Engineers, Industrial Pollution & Control Engineering, included in professional core courses wherever it is required and safety, petrochemical, energy and industrial waste management related courses in professional elective courses.**
7. **The total percentage of syllabus revision for B.Tech Chemical Engineering Program is 35%.**
8. The curriculum is encompassing the courses that enable employability or entrepreneurship or skill development (Appendix- II).
9. In the B.Tech. Chemical Engineering revised regulation R21, the significant changes are made in the content of all courses and hence the courses are considered as new courses (Appendix- III)

APPENDIX – I
Course Structure

I Year I Semester

Course Title	L	T	P	C
Engineering Mathematics-I (D)	3	1	0	4
Engineering Physics (B)	3	0	2	4
Engineering Chemistry	3	0	2	4
Basics of Electrical & Electronics Engineering	3	0	2	4
Engineering Graphics & Design	0	0	2	1
Introduction to C Programming	3	0	2	4
Constitution of India	1	0	0	1
Physical Fitness, Sports & Games - I	0	0	3	1
Total	16	1	13	23

I Year II Semester

Course Title	L	T	P	C
Engineering Mathematics- II (D)	3	1	0	4
Organic Chemistry	3	0	2	4
Programming for Problem Solving	3	0	2	4
English Proficiency and Communication Skills	0	0	2	1
Technical English Communication	2	0	2	3
Environmental Studies	2	0	0	1
Workshop	1	0	2	2
Physical Fitness, Sports & Games - II	0	0	3	1
Total	14	1	13	20

II Year I Semester

Course Title	L	T	P	C
Chemical Process Calculation	3	0	0	3
Momentum Transfer	3	0	2	4
Mechanical Unit Operations	3	0	2	4
Chemical Engineering Thermodynamics-I	3	0	0	3
Data Structures	2	0	2	3
Life Skills – I	0	0	2	0
Technical Seminar - I	0	0	2	1
Intra-Disciplinary Projects - I	0	0	2	1
Physical Fitness, Sports & Games - III	0	0	2	1
Total	14	0	14	20

II Year II Semester

Course Title	L	T	P	C
Probability and Statistics	3	1	0	4
Process Heat Transfer	3	0	2	4
Chemical Reaction Engineering-I	3	0	2	4
Mass Transfer Operations-I	3	0	2	4
Chemical Engineering Thermodynamics-II	3	0	0	3
Industrial Pollution and Control Engineering	3	0	0	3
Life Skills – II	0	0	2	1
Technical Seminar – II	0	0	2	1
Intra-Disciplinary Projects - II	0	0	2	1
Total	18	1	12	25

III Year I Semester

Course Title	L	T	P	C
Process Dynamics and Control	3	0	2	4
Mass Transfer Operations-II	3	0	2	4
Chemical Technology	3	0	2	4
MATLAB Programming for Chemical Engineers	2	0	2	3
Human Values, Professional Ethics & Gender Equity	2	0	0	2
Soft Skills Laboratory	0	0	2	1
Employability Skills - I	0	0	2	0
Inter-Departmental Projects - I	0	0	4	2
Department Elective – I	3	0	0	3
Open Elective-I	3	0	0	3
Total	19	0	16	26

III Year II Semester

Course Title	L	T	P	C
Chemical Engineering Plant Design and Economics	3	0	0	3
Chemical Reaction Engineering-II	3	0	2	4
Process Modelling, Simulation and Optimization	3	0	2	4
Professional Communication Laboratory	0	0	2	1
Modular Course	0	0	0	1
Employability Skills - II	0	0	2	1
Inter-Departmental Projects - II	0	0	4	2
Department Elective - II	3	0	0	3
Open Elective-II (Swayam/NPTEL)	3	0	0	3
Total	15	0	12	22

IV Year I Semester

Course Title	L	T	P	C
Chemical Process Equipment Design	3	0	2	4
Transport Phenomena	3	0	0	3
Principles of Management and Organizational Behavior	3	0	0	3
Societal - Centric and Industry Related Projects	0	0	6	3
Department Elective – III(Swayam/NPTEL)	3	0	0	3
Department Elective – IV(Swayam/NPTEL)	3	0	0	3
Open Elective-III	3	0	0	3
Total	18	0	8	22

IV Year II Semester

Course Title	L	T	P	C
Internship / Project work	-	-	24	12
Total	-	-	24	12

L = Lecture ; T = Tutorial ; P = Practical ; C = Credits

The courses that are highlighted denote implementation of 'Choice Based Credit System (CBCS)'

R-21 Department Elective Courses

Type	Course Title	L	T	P	C
Department Elective	Material Science and Technology	3	0	0	3
Department Elective	Novel Separation Processes	3	0	0	3
Department Elective	Energy Management and Auditing	3	0	0	3
Department Elective	Aspen Plus® simulation software - a basic course for beginners	3	0	0	3
Department Elective	Polymer Science and Engineering	3	0	0	3
Department Elective	Petro Chemicals	3	0	0	3
Department Elective	Chemical Process Safety	3	0	0	3
Department Elective	Chemical Process Intensification	3	0	0	3
Department Elective	Solid Waste Management and Treatment	3	0	0	3
Department Elective	Energy conservation and waste heat recovery	3	0	0	3
Department Elective	Petroleum Refinery Engineering	3	0	0	3
Department Elective	Fundamentals of Nanotechnology	3	0	0	3

Department Elective	Chemical plant Safety and Risk assessment	3	0	0	3
Department Elective	Biochemical Engineering	3	0	0	3
Department Elective	Colloidal and Interfacial Science	3	0	0	3
Department Elective	Waste to Energy Conversion	3	0	0	3
Department Elective	Non-Conventional Energy Resources	3	0	0	3
Department Elective	Computational Fluid Dynamics	3	0	0	3
Department Elective	Surface Production Operations	3	0	0	3
Department Elective	General Pharmacy	3	0	0	3
Department Elective	Industrial Safety Engineering	3	0	0	3
Department Elective	Design an Analysis of Experiments	3	0	0	3
Department Elective	Energy Integration	3	0	0	3
Department Elective	Environmental Regulations and Impact Analysis	3	0	0	3
Department Elective	Natural Gas Engineering	3	0	0	3
Department Elective	Industrial Safety and Hazard Analysis	3	0	0	3
Department Elective	Industrial Pharmacy	3	0	0	3
Department Elective	Industrial Instrumentation	3	0	0	3

DEPARTMENT OF CHEMICAL ENGINEERING

APPENDIX - II

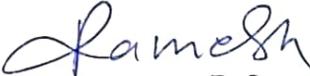
List of courses that enable employability or entrepreneurship or skill development in the R-21 B.Tech – Chemical Engineering

Sl. No.	Semester (Year)	Course Name	Employability/ Entrepreneurship/ Skill development
1	First Year	Engineering Mathematics - I (D)	Skill development
	(Semester I)		
2	First Year	Engineering Physics (B)	Skill development
	(Semester I)		
3	First Year	Engineering Chemistry	Skill development
	(Semester I)		
4	First Year	Basics of Electrical & Electronics Engineering	Skill development
	(Semester I)		
5	First Year	Introduction to C Programming	Skill development
	(Semester I)		
6	First Year	Engineering Mathematics - II (D)	Skill development
	(Semester II)		
7	First Year	Organic Chemistry	Skill development
	(Semester II)		
8	First Year	Programming for Problem Solving	Skill development
	(Semester II)		
9	First Year	Technical English Communication	Skill development
	(Semester II)		
10	First Year	Workshop	Skill development
	(Semester II)		
11	Second Year	Chemical Process Calculations	Skill development
	(Semester I)		
12	Second Year	Momentum Transfer	Skill development
	(Semester I)		
13	Second Year	Mechanical Unit Operations	Employability
	(Semester I)		
14	Second Year	Chemical Engineering Thermodynamics - I	Skill development
	(Semester I)		
15	Second Year	Data Structures	Skill development
	(Semester I)		
16	Second Year	Technical Seminar-I	Skill development
	(Semester I)		
17	Second Year	Intra-disciplinary Projects-I	Skill development
	(Semester I)		
18	Second Year	Probability and Statistics	Skill development

	(Semester II)		
19	Second Year	Process Heat Transfer	Skill development
	(Semester II)		
20	Second Year	Chemical Reaction Engineering-I	Skill development
	(Semester II)		
21	Second Year	Mass Transfer Operations-I	Skill development
	(Semester II)		
22	Second Year	Chemical Engineering Thermodynamics-II	Skill development
	(Semester II)		
23	Second Year	Industrial Pollution and Control Engineering	Skill development
	(Semester II)		
24	Second Year	Technical Seminar-II	Skill development
	(Semester II)		
25	Second Year	Intra-disciplinary Projects-II	Skill development
	(Semester II)		
26	Third Year	Process Dynamics and Control	Skill development
	(Semester I)		
27	Third Year	Mass Transfer Operations-II	Skill development
	(Semester I)		
28	Third Year	Chemical Technology	Skill development
	(Semester I)		
29	Third Year	Matlab Programming for Chemical Engineers	Skill development
	(Semester I)		
30	Third Year	Human Values, Professional Ethics & Gender Equity	Employability
	(Semester I)		
31	Third Year	Inter Departmental Projects-I	Skill development
	(Semester I)		
32	Third Year	Chemical Engineering Process Design and Economics	Skill development
	(Semester II)		
33	Third Year	Chemical Reaction Engineering-II	Skill development
	(Semester II)		
34	Third Year	Process Modelling, Simulation and Optimization	Skill development
	(Semester II)		
35	Third Year	Inter Departmental Projects-II	Skill development
	(Semester II)		
36	Fourth Year	Chemical Process Equipment Design	Skill development
	(Semester I)		
37	Fourth Year	Transport Phenomena	Skill development
	(Semester I)		
38	Fourth Year	Principles of Management and Organizational Behavior	Skill development
	(Semester I)		
39	Fourth Year	Societal Centric and Industry Related Project	Employability
	(Semester I)		
40	Fourth Year	Project work / Internship	Employability

	(Semester II)	(Industry Oriented Projects)	
41		Material Science and Technology	Skill development
42		Novel Separation Processes	Skill development
43		Energy Management and Auditing	Skill development
44		Aspen Plus® simulation software - a basic course for beginners	Employability
45		Polymer Science and Engineering	Employability
46		Petro Chemicals	Skill development
47		Chemical Process Safety	Employability
48		Chemical Process Intensification	Skill development
49		Solid Waste Management and Treatment	Employability
50		Energy conservation and waste heat recovery	Skill development
51		Petroleum Refinery Engineering	Skill development
52		Fundamentals of Nanotechnology	Skill development
53		Chemical plant Safety and Risk assessment	Skill development
54		Biochemical Engineering	Skill development
55		Colloidal and Interfacial Science	Skill development
56		Waste to Energy Conversion	Skill development
57		Non-Conventional Energy Resources	Skill development
58		Computational Fluid Dynamics	Skill development
59		Surface Production Operations	Skill development
60		General Pharmacy	Skill development
61		Industrial Safety Engineering	Skill development

62		Design and Analysis of Experiments	Employability
63		Energy Integration	Employability
64		Environmental Regulations and Impact Analysis	Employability
65		Natural Gas Engineering	Employability
66		Industrial Safety and Hazard Analysis	Employability
67		Industrial Pharmacy	Skill development
68		Industrial Instrumentation	Skill development


Chairman BoS

**VIGNAN'S**

Foundation for Science, Technology & Research

(Deemed to be UNIVERSITY)

-Estd. u/s 3 of UGC Act 1956

DEPARTMENT OF CHEMICAL ENGINEERING**APPENDIX - III****List of new courses in the R-21
B.Tech – Chemical Engineering Curriculum**

Sl. No.	Semester (Year)	Course Name	Employability/ Entrepreneurship/ Skill development
1	First Year	Engineering Chemistry	Skill development
	(Semester I)		
2	First Year	Introduction to C Programming	Skill development
	(Semester I)		
3	First Year	Programming for Problem Solving	Skill development
	(Semester II)		
4	Second Year	Data Structures	Skill development
	(Semester I)		
5	Second Year	Probability and Statistics	Skill development
	(Semester II)		
6	Second Year	Mass Transfer Operations-I	Skill development
	(Semester II)		
7	Second Year	Industrial Pollution and Control Engineering	Skill development
	(Semester II)		
8	Third Year	Process Dynamics and Control	Skill development
	(Semester I)		
9	Third Year	Mass Transfer Operations-II	Skill development
	(Semester I)		
10	Third Year	MATLAB Programming for Chemical Engineers	Skill development
	(Semester I)		
11	Third Year	Chemical Reaction Engineering-II	Skill development
	(Semester II)		
12	Third Year	Industrial Pollution & Control Engineering	Skill development
	(Semester II)		
13	Fourth Year	Process Modelling, Simulation and Optimization	Skill development
	(Semester I)		
14	Fourth Year	Principles of Management and Organizational Behavior	Skill development
	(Semester I)		
15		Aspen Plus® simulation software - a basic course	Skill development

		for beginners	
16		Computer Aided Applied Single Objective Optimization	Skill development
17		Electrochemical Technology In Pollution Control	Employability
18		Environmental Quality Monitoring & Analysis	Skill development
19		Wastewater Treatment and Recycling	Employability
20		Conventional Energy Resources	Skill development
21		Energy Integration	Skill development
22		Electrochemical Energy Storage	Skill development
23		Elements of Solar Energy Conversion	Skill development
24		Basics of Petroleum Engineering	Skill development
25		Surface Production Operations	Skill development
26		Upstream LNG Technology	Skill development
27		Industrial Safety and Hazard Analysis	Employability
28		Chemical Process Safety	Employability
29		Chemical plant safety and risk assessment	Employability
30		Industrial safety engineering	Employability
31		Industrial Instrumentation	Employability
32		Biochemical Engineering	Skill development
33		Material Science & Technology	Employability


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