

**Course Structure of BTech Programme  
in  
Chemical Engineering  
(From AY 2023-24 onwards)**

Course structure of B.Tech. 1<sup>st</sup> year

Semester I

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
EE 1XX	Basic Electrical Engineering	1-1-0	2
ME 1XX	Engineering Mechanics	2-0-0	2
PH 101	Basics of Physics	2-1-0	3
PH 156	Physics Lab- I	0-0-2	1
MA 105 (A)	Calculus-I (half Semester)	3-1-0 (=4/2)	2
MA 105 (B)	Calculus-II (half Semester)	3-1-0 (=4/2)	2
CH 103	Chemistry	3-0-0	3
CH 153	Chemistry Lab	0-0-2	1
HS 1XX	Language and Composition	2-0-0	2
ZXXX	Flexible Elective (HSS)	1-0-0	1
NO 101	National Sports Organization (NSO)	0-0-0	P/NP
Total		14-3-4	19

Semester II

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
BSE 102	Biosciences	2-1-0	3
MA 106 (A)	Linear Algebra (half Semester)	2-1-0 (=3/2)	1.5
MA 106 (B)	Differential Equations-I (half Semester)	2-1-0 (=3/2)	1.5
ES 1XX	Environmental Studies: Scientific and Engineering Aspects (half Semester)	2-1-0 (=3/2)	1.5
HS 1XX	Environmental Studies: Social Aspects (half Semester)	2-1-0 (=3/2)	1.5
HS 108	Fundamentals of Economics	2-0-0	2
IC 1XX	Makerspace	1-0-6	4
CS 103	Computer Programming	2-0-0	2
IC 151	Computer Programming Lab	0-0-3	1.5
ZXXX	Flexible Elective	1-0-0	1
ZXXX	Flexible Elective	1-0-0	1
ZXXX	Flexible Elective (HSS)	1-0-0	1
NO 101	National Sports Organization (NSO)	0-0-0	P/NP
Total		14-3-9	21.5

2<sup>nd</sup> Year B. Tech. in Chemical Engineering

Semester III

Course Code	Course title	Weekly Contact Hours (L-T-P)	Credits
ZZ xxx	Course – I, Minor program	X-X-X	3
MA 203	Complex analysis and Differential equations	3-1-0	4
ChE 2xx	Chemical Engineering Thermodynamics	2-1-0	3
ChE 2xx	Transport Phenomena	2-1-0	3
ChE 2xx	Materials Science for Chemical Engineers	2-1-0	3
ChE 2xx	Chemical Process Calculations	2-1-0	3
ChE 2xx	Department Elective -1	2-1-0	3
ChE 2xx	Computer-aided chemical Engineering lab -1	0-0-2	1
ChE 2xx	Heat and Mass Transfer Lab	0-0-2	1
ChE 2xx	Materials Characterization lab	0-0-2	1
Total		13-6-6	22/25

Semester IV

Course Code	Course title	Weekly Contact Hours (L-T-P)	Credits
ZZ xxx	Course – II, Minor program	X-X-X	3
MA 204	Numerical Methods	2-1-0	3
ChE 2xx	Fluid Mechanics	2-1-0	3
ChE 2xx	Chemical Reaction Engineering	2-1-0	3
ChE 2xx	Separation processes	2-1-0	3
ChE 2xx	Department Elective - 2	2-1-0	3
ZZ 2xxx	Institute open elective -1	2-1-0	3
ChE 2xx	Reaction Engineering lab	0-0-2	1
ChE 2xx	Fluid Mechanics lab	0-0-2	1
Total		12-6-4	20/23

3<sup>rd</sup> Year B. Tech. in Chemical Engineering

Semester V

Course Code	Course title	Weekly Contact Hours (L-T-P)	Credits
ZZ xxx	Course – III, Minor program	X-X-X	3
ChE 3xx	Process modeling	2-1-0	3
ChE 3xx	Fluid Particle Systems	2-1-0	3
ChE 3xx	Biochemical Engineering	2-1-0	3
ChE 3xx	Chemical Process synthesis and simulation	2-1-0	3
ChE 2xx	Department Elective - 3	2-1-0	3
ZZ 2xxx	Institute open elective - 2	2-1-0	3
ChE 2xx	Bioprocessing lab	0-0-2	1
ChE 2xx	Unit operations Lab	0-0-2	1
Total		12-6-4	20/23

Semester VI

Course Code	Course title	Weekly Contact Hours (L-T-P)	Credits
ChE 3xx	Computer-Aided Process Equipment Design	2-1-0	3
ChE 3xx	Process Dynamics, Instrumentation & Control	2-1-0	3
ChE 3xx	Chemical Process Technology and intensification	2-1-0	3
ChE 3xx	Plant design and Economics	2-1-0	3
ChE 2xx	Department Elective – 4	2-1-0	3
ChE 2xx	Department Elective – 5	2-1-0	3
ZZ 2xxx	Institute open elective -3	2-1-0	3
ChE 2xx	Process Control lab	0-0-2	1
ChE 2xx	Computer-aided chemical Engineering lab – 2	0-0-2	1
Total		14-6-4	23

4<sup>th</sup> Year B. Tech. in Chemical Engineering

## Semester VII

Course Code	Subject Name	Weekly Contact Hours (L-T-P)	Credits
	B Tech Project (BTP)  Student can do BTech project either outside the institute or within the institute under a supervision of an IIT Indore Faculty.	0-0-32	16
	Internship-I		1
	Internship-II		1
Total		0-0-32	18

## Semester VIII

Course Code	Course title	Weekly Contact Hours (L-T-P)	Credits
ChE 3xx	Department Elective – 6	2-1-0	3
ChE 3xx	Department Elective – 7	2-1-0	3
ZZxxx	Institute open Elective - 4	2-1-0	3
ZZxxx	Institute open Elective - 5	2-1-0	3
ZZxxx	Institute open Elective - 6	2-1-0	3
Total		10-5-0	15

List of Flexible Elective for B.Tech. 1st Year

Semester I

Course Code	Course Title	Teaching Hours (L-T-P)	Credits
HS 1XX	Stress and Mental Health	1-0-0	1
HS 1XX	Frontiers of Thinking	1-0-0	1
HS 1XX	History of Tribal and Folk Art	1-0-0	1
HS 1XX	Cultural Sociology	1-0-0	1

Semester II

Course Code	Course Title	Teaching Hours (L-T-P)	Credits
EE 1XX	Basic Electronics Engineering	1-0-0	1
ME 1XX	Basic Manufacturing Processes	1-0-0	1
ME 1XX	Basic Thermal Engineering	1-0-0	1
PH 1XX	Basics of Laser Engineering	1-0-0	1
HS 1XX	Stress and Mental Health	1-0-0	1
HS 1XX	Frontiers of Thinking	1-0-0	1
HS 1XX	History of Tribal and Folk Art	1-0-0	1
HS 1XX	Cultural Sociology	1-0-0	1
AA 101	Introduction to Space Engineering	1-0-0	1
CE 1XX	Computations in Civil Engineering	1-0-0	1
MM 1XX	Introduction to Materials Engineering	1-0-0	1

List of the Elective Courses for BTech in Chemical Engineering

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
ChE XXX	Chemical Product design	2-1-0	3
ChE XXX	Troubleshooting in chemical plants	2-1-0	3
ChE XXX	Advance Process Control and optimization	2-1-0	3
ChE XXX	Energy and Resource management	2-1-0	3
ChE XXX	Carbon capture and utilization technologies	2-1-0	3
ChE XXX	Energy storage and Conversion: Batteries, Hydrogen fuel cells etc.,	2-1-0	3
ChE XXX	Biologicals and Pharmaceuticals	2-1-0	3
ChE XXX	Synthetic Biology	2-1-0	3
ChE XXX	System biology	2-1-0	3
ChE XXX	Metabolic Engineering	2-1-0	3
ChE XXX	Chemical Product design	2-1-0	3
ChE XXX	Project Management	2-1-0	3
ChE XXX	Advanced separation processes (in collaboration with chemistry/biology departments)	2-1-0	3
ChE XXX	Process Economics	2-1-0	3
ChE XXX	Solid-Fluid interaction	2-1-0	3
ChE XXX	Modelling and Simulation of Multiscale processes	2-1-0	3
ChE XXX	Petrochemical processing	2-1-0	3
ChE XXX	Polymer Science and Engineering	2-1-0	3
ChE XXX	Textile Engineering	2-1-0	3