

Indian Institute of Technology Indore



Bachelor of Science (B.S.)

in

Applied and Industrial Chemistry

DEPARTMENT OF CHEMISTRY

April 2026

[After incorporating decisions of 62nd meeting of the Senate held on April 20, 2026]

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Course Structure of Bachelor of Science (B.S.) In Applied and Industrial Chemistry

(Senate Resolution 59.6)

1st Year B.S. in Applied & Industrial Chemistry

Semester I

Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
EE 101	Basic Electrical Engineering	1-1-0	2
ME 101	Engineering Mechanics	2-0-0	2
PH 107	Basics of Physics	2-1-0	3
PH 157	Physics Lab-I	0-0-2	1
MA 101N	Calculus-I	3-1-0 (1/2 Semester)	2
MA 103N	Calculus-II	3-1-0 (1/2 Semester)	2
HS 109	Language and Composition	2-0-0	2
HS XXX	Flexible Elective (HSS)	1-0-0	1
IC 152	Makerspace	1-0-6	4
CS 103	Computer Programming	2-0-0	2
IC 151	Computer Programming Lab	0-0-3	1.5
NO 101	National Sports Organization (NSO)	0-0-0	P/NP
	Total		22.5

Semester II

Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
BSE 102	Bioscience	2-1-0	3
MA 102N	Linear Algebra	2-1-0 (1/2 Semester)	1.5
MA 104N	Differential Equation-I	2-1-0 (1/2 Semester)	1.5
ES 102	Environmental Studies: Scientific and Engineering Aspects	2-1-0 (1/2 Semester)	1.5
HS 102	Environmental Studies: Social Aspects	2-1-0 (1/2 Semester)	1.5
HS 104	Fundamentals of Economics	2-0-0	2
CH 105	Chemistry	3-0-0	3
CH 155	General Chemistry Lab	0-0-2	1
ZZ XXX	Flexible Elective-I	1-0-0	1
ZZ XXX	Flexible Elective-II	1-0-0	1
HS XXX	Flexible Elective (HSS)	1-0-0	1
NO 102	National Sports Organization	0-0-0	P/NP

	(NSO)		
	Total		18

**2nd Year B.S. in
Applied & Industrial Chemistry**

Semester III

Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
ZZ XXX	Course-I Minor Program	2-1-0	3
MA 207 (B)	Differential Equation-II	3-1-0 (1/2 Semester)	2
CH XXX	Probability and Statistics for Chemical Applications	2-1-0 (1/2 Semester)	1.5
CH XXX	Introductory Quantum Chemistry	2-0-2 (1/2 Semester)	1.5
CH XXX	Chemical Thermodynamics	2-1-0	3
CH XXX	Introductory Organic Chemistry	2-1-0	3
CH XXX	Coordination Chemistry	2-1-0	3
CH XXX	Solid State and Material Chemistry	2-1-0	3
CH XXX	Chemical Synthesis Lab	0-0-4	2
CH XXX	Department Elective-I	2-1-0	3
	Total		22/25

Semester IV

Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
ZZ 2XX	Course-II Minor Program	2-1-0	3
MA 204N	Numerical Methods	2-0-2	3
CH XXX	Chemical Kinetics	2-0-2 (1/2 Semester)	1.5
CH XXX	Main-group Chemistry	2-1-0 (1/2 Semester)	1.5
CH XXX	Biological Chemistry	2-1-0 (1/2 Semester)	1.5
CH XXX	Analytical Chemistry	2-1-0	3
CH XXX	Reaction Mechanism and Retrosynthesis	2-1-0	3
CH XXX	Analytical Chemistry Lab	0-0-4	2
CH XXX	Department Elective-II	2-1-0	3
ZZ 2XX	Institute Elective-I	2-1-0	3
	Total		21.5/24.5

**3rd Year B.S. in
Applied & Industrial Chemistry**

Semester V

Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
ZZ 3XX	Course-III Minor Program	2-1-0	3
CH-XX	Stereochemistry and Electrocyclic Reactions	2-0-2	3
CH XXX	Electrochemistry	2-1-0 (1/2 Semester)	1.5
CH XXX	Symmetry and Spectroscopy	2-1-0	3
CH XXX	Organometallic Chemistry of Transition Metals	2-1-0 (1/2 Semester)	1.5
CH XXX	Industrial Chemistry	2-0-2	3
CH XXX	Electrochemistry and Energy Lab	0-0-4	2
CH XXX	Computational Modelling Lab	0-1-2	2
CH XXX	Department Elective-III	2-1-0	3
ZZ 3XX	Institute elective-II	2-1-0	3
	Total		22/25

Semester VI

Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
ZZ 3XX	Course-IV Minor program	2-1-0	3
CH XXX	Catalytic Transformations	2-1-0 (1/2 Semester)	1.5
CH XXX	Data Analysis and AI/ML in Chemistry	2-1-0 (1/2 Semester)	2
CH XXX	Polymer Chemistry	2-1-0	3
CH XXX	Spectroscopy for Structure Determination	2-1-0	3
CH XXX	Medicinal Chemistry	2-0-0	3
CH XXX	Drug Design and Discovery Lab	0-0-4	2
CH XXX	Prototype and applied Chemistry Lab	0-0-4	2
CH XXX	Department Elective-IV	2-1-0	3
ZZ 3XX	Institute Elective-III	2-1-0	3
	Total		22.5/25.5

**4th Year B.S. in
Applied & Industrial Chemistry**

Semester VII

Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
ZZ XXX	Course-V Minor Program	2-0-0	2
CH XXX	BS-Project	0-0-32	16
ZZ XXX	Internship Or Professional/Societal-Connect Basket Course	X-X-X	1.5
	Total		17.5/20.5

Semester VIII

Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
CH XX	Translational Research Project	0-0-12	6
CH XXX	Department Elective-V	2-1-0	3
ZZ XXX	Institute Elective-IV	2-1--0	3
ZZ XXX	Institute Elective-V	2-1-0	3
	Total		15

Suggested List of the Elective Courses

Semester	Course Codes	Course Title	Weekly Contact Hours (L-T-P)	Credits
III (DE-I)	CH 2XX	Principles of Optoelectronics	2-1-0 (1/2 Semester)	1.5
	CH 2XX	Environmental Chemistry	2-1-0 (1/2 Semester)	1.5
	CH 2XX	Chemistry of Inner Transition Metals	2-1-0 (1/2 Semester)	1.5
IV (DE-II)	CH 2XX	Colloidal Chemistry	2-1-0 (1/2 Semester)	1.5
	CH 2XX	Molecular Self-Assembly	2-1-0 (1/2 Semester)	1.5
	CH 2XX	Computer Programming for Chemical Applications	2-1-0 (1/2 Semester)	1.5
V (DE-III)	CH 3XX	Magnetochemistry	2-1-0	3
	CH 3XX	Sustainable Chemical Process	2-1-0	3
	CH 3XX	Molecular Material	2-1-0	3
VI (DE-IV)	CH 3XX	Electrochemical Systems	2-1-0	3
	CH 3XX	Quantum Chemistry: Atoms and Molecules	2-1-0	3
	CH 3XX	Pharmaceutical Chemistry	2-1-0	3

	CH 3XX	Chemistry of Semiconducting Materials	2-1-0	3
VIII (DE-V)	CH 4XX	Materials for Energy Applications	2-1-0	3
	CH 4XX	Chemistry in Healthcare	2-1-0	3
	CH 4XX	Molecular Modelling	2-1-0	3
	CH 4XX	Electronic Structure Methods	2-1-0	3
	CH 4XX	Sensors	2-1-0	3
	CH 4XX	Oil, Gas and Petrochemicals	2-1-0	3

