

Department of Applied Chemistry and Basic Sciences (Course Outline for Chemistry Honors' Programme)

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Certificate In Introductory Chemistry							
SEMESTER-I							
Major-1	CHEM-111	Fundamentals of Inorganic Chemistry-I	4-0-0	4	50	50	100
Major-2	BOTN-111	Microbes, Algae and Fungi	4-0-0	4	50	50	100
Major-3	ZOOL-111	Non-Chordate	4-0-0	4	50	50	100
Major-1 Practical	CHEM-111P	Fundamentals of Inorganic Chemistry-I-Lab	0-0-2	2	50	50	100
Major-2 Practical	BOTN-111P	Microbes, Algae and Fungi-Lab	0-0-2	2	50	50	100
Major-3 Practical	ZOOL-111P	Non-Chordate-Lab	0-0-2	2	50	50	100
Minor Elective-1	BIOT-112	Genetics	4-0-0	4	50	50	100
Vocational Minor		SEC-1 (Choose from the list)	3-0-0	3	50	50	100
Co-Curricular Value additional Course/ Qualifying/Non Remedial	VAC-1	Basic Communication and Skills	3-0-0	3	50	50	100
Total Credit				25			

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Certificate In Introductory Chemistry							
SEMESTER-II							
Major-1	CHEM-121	Fundamentals of Organic Chemistry-I	4-0-0	4	50	50	100
Major-2	BOTN-121	Archegomates	4-0-0	4	50	50	100
Major-3	ZOOL-121	Chordates	4-0-0	4	50	50	100
Major-1 Practical	CHEM-121P	Fundamentals of Organic Chemistry-I Lab	0-0-2	2	50	50	100
Major-2 Practical	BOTN-121P	Archegomates-Lab	0-0-2	2	50	50	100
Major-3 Practical	ZOOL-121P	Chordates-Lab	0-0-2	2	50	50	100
Vocational Minor		SEC-2 (Choose from the list)	3-0-0	3	50	50	100
Co-Curricular Value additional Course/ Qualifying/Non Remedial	VAC-2	Environment Studies	3-0-0	3	50	50	100
Total Credit				21			
Exit Option with “Undergraduate Certificate” (<i>Certificate in Introductory Chemistry</i>) after the first year or two semesters with the completion of the course equivalent to minimum 40 credits. Along with entry option to third semester after exit.							

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Diploma In Chemical Sciences							
SEMESTER-III							
Major-1	CHEM-231	Physical Chemistry-I	4-0-0	4	50	50	100
Major-2	BOTN-231	Morphology, Anatomy and Embryology	4-0-0	4	50	50	100
Major-3	ZOOL-231	Molecular Biology, Toxicology & Histology	4-0-0	4	50	50	100
Major-1 Practical	CHEM-231P	Physical Chemistry –I Lab	0-0-2	2	50	50	100
Major-2 Practical	BOTN-231P	Morphology, Anatomy and Embryology- Lab	0-0-2	2	50	50	100
Major-3 Practical	ZOOL-231P	Molecular Biology, Toxicology & Histology - Lab	0-0-2	2	50	50	100
Vocational Minor		SEC-3 (Choose from the list)	3-0-0	3	50	50	100
Co-Curricular Value additional Course/ Qualifying/Non Remedial	VAC-3	Management Paradigms from Bhagavad Gita	3-0-0	3	50	50	100
Total Credit				21			

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Diploma In Chemical Sciences							
SEMESTER-IV							
Major-1	CHEM-241	Inorganic Chemistry II	4-0-0	4	50	50	100
Major-2	BOTN-241	Cytogenetics and Plant Breeding	4-0-0	4	50	50	100
Major-3	ZOOL-241	Microbiology & Animal Behaviour	4-0-0	4	50	50	100
Major-1 Practical	CHEM-241P	Inorganic Chemistry II-Lab	0-0-2	2	50	50	100
Major-2 Practical	BOTN-241P	Cytogenetics and Plant Breeding-Lab	0-0-2	2	50	50	100
Major-3 Practical	ZOOL-241P	Microbiology & Animal Behaviour -Lab	0-0-2	2	50	50	100
Minor Elective-1	ZOOL-242	Biostatics and Bioinformatics	4-0-0	4	50	50	100
Vocational Minor		SEC-4 (Choose from the list)	3-0-0	3	50	50	100
Co-Curricular Value additional Course/ Qualifying/Non Remedial	VAC-4	Vedic Science/ Vedic Mathematics	3-0-0	3	50	50	100
Total Credit				25			
<i>Exit Option with "Undergraduate Diploma" (Diploma In Chemical Sciences) after the two years or four semesters with the completion of the course equivalent to minimum 80 credits. Along with entry option to fifth semester after exit.</i>							

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Degree in Bachelor of Science							
SEMESTER-V							
Major-1	CHEM-351	Organic Chemistry II	4-0-0	4	50	50	100
Major-2	CHEM-352	Instrumental Methods Of Chemical Analysis	4-0-0	4	50	50	100
Major-3	ZOOL-351	Genetics & Cell Biology	4-0-0	4	50	50	100
Major-4	ZOOL-352	Animal Physiology & Biochemistry	4-0-0	4	50	50	100
Major-1 Practical	CHEM-351P	Organic Chemistry II Lab	0-0-1	1	50	50	100
Major-2 Practical	CHEM-352P	Instrumental Methods Of Chemical Analysis-Lab	0-0-1	1	50	50	100
Major-3 Practical	ZOOL-351P	Genetics & Cell Biology - Lab	0-0-1	1	50	50	100
Major-4 Practical	ZOOL-352P	Animal Physiology & Biochemistry-Lab	0-0-1	1	50	50	100
Co-Curricular Value additional Course/ Qualifying/Non Remedial	VAC-5	Meditation/PDP Through Applied Physiology of Ram Charit Manas Sports/Photography/Publication and creative writing/creative arts/NCC	3-0-0	3	50	50	100
Total Credit				20			

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Degree in Bachelor of Science							
SEMESTER-V							
Major-1	CHEM-351	Organic Chemistry II	4-0-0	4	50	50	100
Major-2	CHEM-352	Instrumental Methods Of Chemical Analysis	4-0-0	4	50	50	100
Major-3	BOTN-351	Molecular Biology and Plant Biotechnology	4-0-0	4	50	50	100
Major-4	BOTN-352	Economic Botany	4-0-0	4	50	50	100
Major-1 Practical	CHEM-351P	Organic Chemistry II Lab	0-0-1	1	50	50	100
Major-2 Practical	CHEM-352P	Instrumental Methods Of Chemical Analysis-Lab	0-0-1	1	50	50	100
Major-3 Practical	BOTN-351P	Molecular Biology and Plant Biotechnology Lab	0-0-1	1	50	50	100
Major-4 Practical	BOTN-352P	Economic Botany -Lab	0-0-1	1	50	50	100
Co-Curricular Value additional Course/ Qualifying/Non Remedial	VAC-5	Meditation/PDP Through Applied Physiology of Ram Charit Manas Sports/Photography/Publication and creative writing/creative arts/NCC	3-0-0	3	50	50	100
Total Credit				20			

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Degree in Bachelor of Science							
SEMESTER-VI							
Major-1	CHEM-361	Physical Chemistry II	4-0-0	4	50	50	100
Major-2	CHEM-362	Organometallic Compounds And Bioinorganic Chemistry	4-0-0	4	50	50	100
Major-3	ZOOL-361	Basic Mammalian Endocrinology	4-0-0	4	50	50	100
Major-4	ZOOL-362	Developmental Biology of Vertebrates	4-0-0	4			
Major-1 Practical	CHEM-361P	Physical Chemistry II Lab	0-0-1	1	50	50	100
Major-2 Practical	CHEM-362P	Organometallic Compounds And Bioinorganic Chemistry-Lab	0-0-1	1	50	50	100
Major-3 Practical	ZOOL-361P	Basic Mammalian Endocrinology-Lab	0-0-1	1	50	50	100
Major-4 Practical	ZOOL-362P	Developmental Biology of Vertebrates-Lab	0-0-1	1	50	50	100
Co-Curricular Value additional Course	VAC-6	Essence of Indian Traditional Knowledge / Vivekananda Studies/ Sports/Photography/Publication and creative writing/creative arts/NCC	3-0-0	3	50	50	100
Total Credit				20			

Type of Course	Course Code	Title of the Course	L-T-P /Week	No. of Credits	University Exam	Internal Assessment	Total
Degree in Bachelor of Science							
SEMESTER-VI							
Major-1	CHEM-361	Physical Chemistry II	4-0-0	4	50	50	100
Major-2	CHEM-362	Organometallic Compounds And Bioinorganic Chemistry	4-0-0	4	50	50	100
Major-3	BOTN-361	Plant Physiology and Biochemistry	4-0-0	4	50	50	100
Major-4	BOTN-362	Ecology and Biostatistics	4-0-0	4			
Major-1 Practical	CHEM-361P	Physical Chemistry II Lab	0-0-1	1	50	50	100
Major-2 Practical	CHEM-362P	Organometallic Compounds And Bioinorganic Chemistry-Lab	0-0-1	1	50	50	100
Major-3 Practical	BOTN-361P	Plant Physiology and Biochemistry-Lab	0-0-1	1	50	50	100
Major-4 Practical	BOTN-362P	Ecology and Biostatistics - Lab	0-0-1	1	50	50	100
Co-Curricular Value additional Course	VAC-6	Essence of Indian Traditional Knowledge / Vivekananda Studies/ Sports/Photography/Publication and creative writing/creative arts/NCC	3-0-0	3	50	50	100
Total Credit				20			
<p style="text-align: center;"><i>Exit Option with “Bachelor’s Degree (Bachelor of Science)” after the three years or six semesters with the completion of the course equivalent to minimum 120 credits. Along with entry option to fourth year or seventh semester for those students meeting a minimum CGPA of 7.5 in Bachelor’s Degree Examination (BDE).</i></p>							

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Bachelor's Degree (Honors/Research)							
SEMESTER-VII							
Major-1	CHEM-471	Advanced Inorganic Chemistry	6-0-0	6	50	50	100
Major-2	CHEM-472	Advanced Organic Chemistry	4-0-0	4	50	50	100
Major-3	CHEM-473	Molecular Chemistry	4-0-0	4	50	50	100
Major-2 Practical	CHEM-472P	Advanced Organic Chemistry -Lab	0-0-2	2	50	50	100
Major-3 Practical	CHEM-473P	Molecular Chemistry Lab	0-0-2	2	50	50	100
Major-3	MICR-472	Research Methodology	4-0-0	4	50	50	100
Research Project	CHEM-474	Project-I/ Industrial Training	4-0-0	4	50	50	100
Total Credit				26			

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
Bachelor's Degree (Honors/Research)							
SEMESTER-VIII							
Major-1	CHEM-481	Advanced Physical Chemistry	4-0-0	4	50	50	100
Major-2	CHEM-482	Analytical Chemistry	4-0-0	4	50	50	100
Major-3	CHEM-483	Intellectual Property Rights (IPR)	6-0-0	6	50	50	100
Major-1 Practical	CHEM-481P	Advanced Physical Chemistry-Lab	0-0-2	2	50	50	100
Major-2 Practical	CHEM-482P	Analytical Chemistry-Lab	0-0-2	2	50	50	100
Research Project	CHEM-484	Project-II /Industrial Training	4-0-0	4	50	50	100
Major-4	BIOT-483	Research Publication and Ethics	4-0-0	4	50	50	100
Total Credit				26			
<i>Award of Bachelor's Degree (Honors/Research) or Bachelor of Science in Discipline with Research after the four years or eight semesters with the completion of the course equivalent to minimum 160 credits.</i>							

TOTAL CREDITS = 184 (For four years)

Skill Enhancement Courses for Chemistry, Botany, Zoology
(Choose any 01 of the following may be opted in semester I, II, III, IV, V, VI, and VII semesters)

Skill Enhancement Course (Chemistry)	Skill Enhancement Courses (Botany)	Skill Enhancement Courses (Zoology)
CHEM-01: Principles of Analytical Chemistry	BOTN-01 Microbial Biofertilizers	ZOOL-01 Public Health and Hygien
CHEM-02: Methods in Green Chemistry	BOTN-02 Herbs as Medicine	ZOOL-02 Aquarium Fish Keeping
CHEM-03: Environmental Chemistry	BOTN-03 Flower Farming	ZOOL-03 Pisci-culture
CHEM-04: Chemical Toxicology and Environmental Pollution	BOTN-04 Study of Medicinal Plants	ZOOL-04 Poultry Farming
CHEM-05: Chemistry of Medicines	BOTN-05 Mushroom Cultivation	ZOOL-05 Sericulture
CHEM-06: Chemistry of Fuel	BOTN-06 Basics of Intellectual Property Rights	ZOOL-06 Apiculture
CHEM-07: Electromagnetic Spectrum: UV, IR and NMR		
CHEM-08: Chemical Materials of Industrial Importance		
CHEM-09: Intellectual Property Rights (IPR)		
CHEM-10: Applications of Computer in Chemistry		
CHEM-11: Molecules of Life		
CHEM-12: General Analytical Techniques		