

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

Type of Course	Course Code	Title of the Course	L-T- P/ Wee k	No. of Credits	University Exam	Internal Assessment	Total
<b>Certificate Course in Introductory Zoology</b>							
<b>SEMESTER-I</b>							
Major-1	ZOOL-111	Non-Chordate	4-0-0	4	50	50	100
Major-2	CHEM-111	Fundamentals of Inorganic Chemistry-I	4-0-0	4	50	50	100
Major-3	BOTN-111	Microbes, Algae and Fungi	4-0-0	4	50	50	100
Major-1 Practical	ZOOL-111P	Non-Chordate-Lab	0-0-2	2	50	50	100
Major-1 Practical	CHEM-111P	Fundamentals of Inorganic Chemistry-I-Lab	0-0-2	2	50	50	100
Major-3 Practical	BOTN-111P	Microbes, Algae and Fungi-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
<b>Total Credit</b>				<b>25</b>			

Type of Course	Course Code	Title of the Course	L-T- P / Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Certificate Course in Introductory Zoology</b>							
<b>SEMESTER-II</b>							
Major-1	ZOOL-121	Chordate	4-0-0	4	50	50	100
Major-2	CHEM-121	Fundamentals of Organic Chemistry-I	4-0-0	4	50	50	100
Major-3	BOTN-121	Archegoniates	4-0-0	4	50	50	100
Major-1 Practical	ZOOL-121P	Chordate-Lab	0-0-2	2	50	50	100
Major-2 Practical	CHEM-121P	Fundamentals of Organic Chemistry-I Lab	0-0-2	2	50	50	100
Major-3 Practical	BOTN-121P	Archegoniates-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
<b>Total Credit</b>				<b>21</b>			
<i>Exit Option with “Undergraduate Certificate” (Certificate in Introductory Zoology) 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.</i>							

Type of Course	Course Code	Title of the Course	L-T- P/ Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Diploma in Life Science</b>							
<b>SEMESTER-III</b>							
Major-1	ZOOL-231	Molecular Biology, Toxicology & Histology	4-0-0	4	50	50	100
Major-2	CHEM-231	Physical Chemistry-I	4-0-0	4	50	50	100
Major-3	BOTN-231	Morphology, Anatomy and Embryology	4-0-0	4	50	50	100
Major-1 Practical	ZOOL-231P	Molecular Biology, Toxicology & Histology - Lab	0-0-2	2	50	50	100
Major-2 Practical	CHEM-231P	Physical Chemistry –I Lab	0-0-2	2	50	50	100
Major-3 Practical	BOTN-231P	Morphology, Anatomy and Embryology- 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
<b>Total Credit</b>				<b>21</b>			

Type of Course	Course Code	Title of the Course	L-T- P/ Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Diploma in Life Science</b>							
<b>SEMESTER-IV</b>							
Major-1	ZOOL-241	Microbiology & Animal Behaviour	4-0-0	4	50	50	100
Major-2	CHEM-241	Inorganic Chemistry II	4-0-0	4	50	50	100
Major-3	BOTN-241	Cytogenetics and Plant Breeding	4-0-0	4	50	50	100
Major-1 Practical	ZOOL-241P	Microbiology & Animal Behaviour -Lab	0-0-2	2	50	50	100
Major-2 Practical	CHEM-241P	Inorganic Chemistry II-Lab	0-0-2	2	50	50	100
Major-3 Practical	BOTN-241P	Cytogenetics and Plant Breeding-Lab	0-0-2	2	50	50	100
Minor Elective-1	CHEM-07	Electromagnetic spectrum: UV, IR& MNR	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
<b>Total Credit</b>				<b>25</b>			
Exit Option with “Undergraduate Diploma” ( <b>Diploma In Life Science</b> ) 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.							

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Degree in Bachelor of Science</b>							
<b>SEMESTER-V</b>							
Major-1	ZOOL-351	Genetics & Cell Biology	4-0-0	4	50	50	100
Major-2	ZOOL-352	Animal Physiology & Biochemistry	4-0-0	4	50	50	100
Major-3	CHEM-351	Organic Chemistry II	4-0-0	4	50	50	100
Major-4	CHEM-352	Instrumental Methods Of Chemical Analysis	4-0-0	4	50	50	100
Major-1 Practical	ZOOL-351P	Genetics & Cell Biology - Lab	0-0-2	2	50	50	100
Major-2 Practical	ZOOL-352P	Animal Physiology & Biochemistry-Lab	0-0-1	1	50	50	100
Major-3 Practical	CHEM-351P	Organic Chemistry II Lab	0-0-1	1	50	50	100
Major-4 Practical	CHEM-352P	Instrumental Methods Of Chemical Analysis-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
<b>Total Credit</b>				<b>20</b>			

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Degree in Bachelor of Science</b>							
<b>SEMESTER-VI</b>							
Major-1	ZOOL-361	Basic Mammalian Endocrinology	4-0-0	4	50	50	100
Major-2	ZOOL-362	Developmental Biology of Vertebrates	4-0-0	4	50	50	100
Major-3	CHEM-361	Physical Chemistry II	4-0-0	4	50	50	100
Major-4	CHEM-362	Organometallic Compounds And Bioinorganic Chemistry	4-0-0	4	50	50	100
Major-1 Practical	ZOOL-361P	Basic Mammalian Endocrinology-Lab	0-0-1	1	50	50	100
Major-2 Practical	ZOOL-362P	Developmental Biology of Vertebrates-Lab	0-0-1	1	50	50	100
Major-3 Practical	CHEM-361P	Physical Chemistry II Lab	0-0-1	1	50	50	100
Major-4 Practical	CHEM-362P	Organometallic Compounds And Bioinorganic Chemistry-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
<b>Total Credit</b>				<b>20</b>			
<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>							

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Degree in Bachelor of Science</b>							
<b>SEMESTER-V</b>							
Major-1	ZOOL-351	Genetics & Cell Biology	4-0-0	4	50	50	100
Major-2	ZOOL-352	Animal Physiology & Biochemistry	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	ZOOL-351P	Genetics & Cell Biology - Lab	0-0-2	2	50	50	100
Major-2 Practical	ZOOL-352P	Animal Physiology & Biochemistry-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
<b>Total Credit</b>				<b>20</b>			

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Degree in Bachelor of Science</b>							
<b>SEMESTER-VI</b>							
Major-1	ZOOL-361	Basic Mammalian Endocrinology	4-0-0	4	50	50	100
Major-2	ZOOL-362	Developmental Biology of Vertebrates	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	50	50	100
Major-1 Practical	ZOOL-361P	Basic Mammalian Endocrinology-Lab	0-0-1	1	50	50	100
Major-2 Practical	ZOOL-362P	Developmental Biology of Vertebrates-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
<b>Total Credit</b>				<b>20</b>			
<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>							



Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Bachelor's Degree (Honors/Research)</b>							
<b>SEMESTER-VII</b>							
Major-1	ZOOL-471	Fundamentals of Immunology	4-0-0	4	50	50	100
Major-2	ZOOL -472	Applied Immunology	4-0-0	4	50	50	100
Major-3	ZOOL -473	Animal Ecology	4-0-0	4	50	50	100
Major-1 Practical	ZOOL -471P	Fundamentals of Immunology -Lab	0-0-2	2	50	50	100
Major-2 Practical	ZOOL -472P	Applied Immunology -Lab	0-0-2	2	50	50	100
Major-3 Practical	ZOOL -473P	Animal Ecology -Lab	0-0-2	2	50	50	100
Minor-3	MICR-472	Research Methodology	4-0-0	4	50	50	100
Research Project	ZOOL -474	Project-I/ Industrial Training/Survey	4-0-0	4	50	50	100
<b>Total Credit</b>				<b>26</b>			

Type of Course	Course Code	Title of the Course	L-T- P /Week	No. of Credits	University Exam	Internal Assessment	Total
<b>Bachelor's Degree (Honors/Research)</b>							

<b>SEMESTER-VIII</b>							
Major-1	ZOOL-481	General Ichthyology	4-0-0	4	50	50	100
Major-2	ZOOL -482	Applied Ichthyology	4-0-0	4	50	50	100
Major-3	ZOOL -483	Basic Limnology	4-0-0	4	50	50	100
Major-1 Practical	ZOOL -481P	General Ichthyology -Lab	0-0-2	2	50	50	100
Major-2 Practical	ZOOL -482P	Applied Ichthyology-Lab	0-0-2	2	50	50	100
Major-3 Practical	ZOOL -483P	Basic Limnology –Lab	0-0-2	2	50	50	100
Research Project	ZOOL -484	Research Project-II /Industrial Training/Survey	4-0-0	4	50	50	100
Minor-4	BIOT-483	Research Publication and Ethics	4-0-0	4	50	50	100
<b>Total Credit</b>				<b>26</b>			
<i>Award of <b>Bachelor's Degree (Honors/Research)</b> or <b>Bachelor of Science in Discipline with Research</b> 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)**

<b>Skill Enhancement Course (Chemistry)</b>	<b>Skill Enhancement Courses (Botany)</b>	<b>Skill Enhancement Courses (Zoology)</b>
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 Pisciculture
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		