# SHRI GURU RAM RAI UNIVERSITY

**[Estd. by Govt. of Uttarakhand, vide Shri Guru Ram Rai University Act no. 03 of 2017 & recognized by UGC u/s (2f) of UGC Act 1956]**

## DEPARTMENT OF ZOOLOGY

## SCHOOL OF BASIC & APPLIED SCIENCES

## SHRI GURU RAM RAI UNIVERSITY

Bachelor of Science /
Bachelor of Science (Hons.) in Zoology /
Bachelor of Science (Hons. with Research) in Zoology

**Based on NEP 2020**

[Exit Options after completion of 01 Year, 02 Years, 03 Years, and 04 Years]

**Effective from Academic Session 2023-2024**

**(Revised on 30th July 2024 & 12th August 2025)**

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**Patel Nagar, Dehradun, Uttarakhand**

## Basic Structure of UG Multidisciplinary Programme (with Three Core Disciplines)
## B.Sc. (Zoology, Botany, and Chemistry/ Zoology, Botany, and Geology as core disciplines)

Discipline Specific Core (DSC)

Discipline Specific Elective (DSE)

General Elective (GE)

Ability Enhancement Courses (AEC)

Skill Enhancement Course (SEC)

Internship/Apprenticeship / Project/ Community Outreach (IAPC)

Value Addition course (VAC)

**Type of Course**

**UG Multidisciplinary Courses of Study Bachelor of Science (Honours/Honours with Research)**

| Sem | Core - Discipline Specific Core (DSC) | Elective- Discipline Specific Elective (DSE) | Elective- Generic Elective (GE) | Ability Enhancement Course (AEC) | Skill Enhancement Course (SEC) | (Internship/Apprenticeship / Project/ Community Outreach) (IAPC) | Value Addition Course (VAC) | Total credits |
|---|---|---|---|---|---|---|---|---|
| | **Course/credit distribution** (Credits 4) Theory or Theory + Practicum (3T+1L) | **Course/ credit distribution** (Credits 4) Theory or Theory + Practicum/ Lab (3T+1L or 2T+2L) | **Course/ credit distribution** (Credits 4) Theory or Theory + Practicum/ Lab (Credits 4T or 3T+1L or 2T+2L) | **Course/ credit distribution** (Credits 2) | **Course/credit distribution** (Credits 2) | **Course/ credit distribution** (Credits 2) | **Course/ credit distribution** (Credits 2) | 22 |
| I | **DSC A 1- (4)** **DSC B 1- (4)** **DSC C 1- (4)** (3T+1L) ***Either CBZ or PCM combination is allowed** | | Choose one from a pool of courses **GE – 1 (4)** | **AEC – 1 (2)** | Choose one from a pool of courses **SEC – 1 (2)** | | Choose one from a pool of courses **VAC – 1 (2)** | 22 |

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|---|---|---|---|---|---|---|---|---|
| II | **DSC A 2- (4)**<br>**DSC B 2- (4)**<br>**DSC C 2- (4)**<br>(3T+1L)<br>*Either CBZ or PCM combination is allowed | | Choose one from a pool of courses **GE – 2 (4)** | **AEC – 2 (2)** | Choose one from a pool of courses **SEC – 2 (2)** | | Choose one from a pool of courses **VAC – 2 (2)** | 22 |
| | ***Students on exit shall be awarded Undergraduate Certificate (in the field of Multidisciplinary study) after securing requisite 44 credits in semester I & II*** | | | | | | | **Total = 44** |
| III | **DSC A 3- (4)**<br>**DSC B 3- (4)**<br>**DSC C 3- (4)**<br>(3T+1L)<br>*Either CBZ or PCM combination is allowed | Choose one from a pool of courses, **DSE A/B/C (4 )**<br>OR<br>**GE - 3 (4)**<br>(4 T/or 3T+1L/or 2T+2L)<br>OR **MOOC** | | **AEC – 3 (2)** | Choose one from **SEC 3 – (2)**<br>OR<br>**Internship/Apprenticeship / Project/ Community Outreach (IAPC) – (2)** | | Choose one from a pool of courses **VAC – 3 (2)** | 22 |
| IV | **DSC A 4- (4)**<br>**DSC B 4- (4)**<br>**DSC C 4- (4)**<br>(3T+1L)<br>*Either CBZ or PCM combination is allowed | Choose one from a pool of courses, **DSE A/B/C (4 )** credits)<br>OR<br>**GE - 4 (4)**<br>(4 T/or 3T+1L/or 2T+2L)<br>OR **MOOC** | | **AEC – 4 (2)** | Choose one from **SEC 4 – (2)**<br>OR<br>**Internship/Apprenticeship / Project/ Community Outreach (IAPC) – (2)** | | Choose one from a pool of courses **VAC – 4 (2)** | 22 |

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|---|---|---|---|---|---|---|---|
| ***Students on exit shall be awarded Undergraduate Diploma (in the field of Multidisciplinary study/Discipline) after securing requisite 88 credits in semester III & IV*** | | | | | | | **Total = 88** |
| V | **DSC A 5- (4)**<br>**DSC B 5- (4)**<br>**DSC C 5- (4)**<br>(3T+1L)<br>*Either CBZ or PCM combination is allowed | Choose one from a pool of courses. **DSE A/B/C (4 )** credits)<br>( 3T+1L/or 2T+2L)<br>OR **MOOC** | Choose one from a pool of courses **GE – 5 (4)**<br>OR **MOOC** | | Choose one from **SEC 5 – (2)**<br>OR<br>**Internship/Apprenticeship / Project/ Community Outreach (IAPC) – (2)** | | 22 |
| VI | **DSC A 6- (4)**<br>**DSC B 6- (4)**<br>**DSC C 6- (4)**<br>(3T+1L)<br>*Either CBZ or PCM combination is allowed | Choose one from a pool of courses, **DSE A/B/C (4 )** credits)<br>( 3T+1L/or 2T+2L)<br>OR **MOOC** | Choose one from a pool of courses **GE – 6 (4)**<br>OR **MOOC** | | Choose one from **SEC 5 – (2)**<br>OR<br>**Internship/Apprenticeship / Project/ Community Outreach (IAPC) – (2)** | | 22 |
| ***Students on exit shall be awarded Bachelor of Science (in the field of Multidisciplinary study/Discipline) after securing the requisite 132 credits on completion of semester VI*** | | | | | | | **Total= 132** |

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|---|---|---|---|---|---|---|
| VII | **DSC A/B/C 7 - (4)**<br><br>(3T+1L) | **Choose 3 DSE** (3x4) courses<br>OR<br>**Choose 2 DSE – (2x4) and one GE (4)** course<br>OR **Choose 1 DSE (4) and 2 GE** (2x4) courses<br>(Total= 12) | | Dissertation on Major/Minor (4+2)<br>OR Academic Project/<br>Entrepreneurship (4+2) **[B.Sc. Honours with Research]**<br>**OR**<br>DSC 4<br>Seminar 2 **[B.Sc. Honours (H)]** | | 22 |
| VIII | **DSC A/B/C 8 - (4)**<br><br>(3T+1L) | **Choose 3 DSE** (3x4) courses<br>OR<br>**Choose 2 DSE – (2x4) and one GE (4)** course<br>OR **Choose 1 DSE (4) and 2 GE** (2x4) courses<br>(Total= 12) | | Dissertation on Major/Minor (4+2)<br>OR Academic Project/<br>Entrepreneurship (4+2) **[B.Sc. Honours with Research]**<br>**OR**<br>DSC 4<br>Seminar 2 **[B.Sc. Honours (H)]** | | 22 |
| ***Students on exit shall be awarded Bachelor of Science (Honours with Research or Honours with Academic project/Entrepreneurship) after securing requisite 176 credits on completion of semester VIII*** | | | | | | **Total = 176** |

* Exit course is mandatory for exit after I year & II year.
* Rectification in 2023-24 & 2024-25 with 2025-26 BOS.

26/07/2025

Dean
School of Basic & Applied Sciences
SGRR University
Patel Nagar, Dehradun-248001

**Course Introduction:**

The restructured B.Sc. programme with Zoology, Botany, and Chemistry as core disciplines is designed in alignment with the Curriculum and Credit Framework for Undergraduate Programmes prescribed by UGC/NEP 2020/ University norms. The programme offers multiple entry and exit options:

- 1-year Undergraduate Certificate in Basic Sciences
- 2-year Undergraduate Diploma
- 3-year Undergraduate Degree
- 4-year Undergraduate Honours / Honours with Research Degree

The B.Sc. (Discipline-Specific Core – Zoology) equips students with comprehensive knowledge and scientific skills to study animals holistically—from molecular and cellular levels to their ecology and evolution. The curriculum integrates core, elective, and vocational courses with strong interdisciplinary components, fostering both depth and breadth of learning.
Emphasis is placed on cutting-edge technologies and recent advancements, including:

- Molecular biology techniques, genomics, bioinformatics, and biotechnology.
- ICT-enabled learning tools, data analytics, and modern field study methods.

Students will gain an understanding of animal diversity, physiology, genetics, ecology, evolutionary biology, and biotechnology, along with the socio-economic and environmental significance of animals. The programme fosters critical thinking, problem-solving, and research competencies relevant to wildlife conservation, sustainable resource management, and applied zoology.

Learning is enriched through classroom instruction, hands-on laboratory training, fieldwork, and outstation

study tours. Students will also engage in research projects and community outreach programs to connect theory with real-world challenges.

This programme is well-suited for learners with a passion for animal life, biodiversity, and ecosystem management, particularly those aspiring to careers as zoologists, wildlife biologists, conservationists, ecologists, environmental consultants, educators, or researchers.

**Eligibility for admission:**

Candidates who have passed 10+2 (Higher Secondary) or equivalent examination from any State/Central recognised board with Physics, Chemistry, and Biology (PCB), securing a minimum of 45% aggregate marks, are eligible to apply. Relaxation in marks will be provided to candidates from SC/ST/OBC and other eligible communities as per University norms/regulations.

**Program Outcomes (POs):**

A transformed curriculum is designed to nurture educated, outcome-oriented graduates who are empowered through discovery-based learning and practical skill development. Students will be adept at addressing real-world challenges, equipped with modern instructional methodologies—including e-learning, flipped classrooms, and hybrid learning approaches. The program aims to prepare responsible citizens who contribute actively to nation-building and drive future societal progress, utilizing the knowledge and expertise acquired in the field of animal science.

**Program Outcomes (POs):**

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|---|---|
| **PO-1** | Bachelor of Science offers theoretical as well as practical knowledge about different subject areas. |
| **PO-2** | Graduates will develop a scientific temperament to solve scientific problems in emerging areas of science at the National and International levels. |
| **PO-3** | Graduates will acquire a coherent understanding of the academic field to pursue multi- and interdisciplinary science careers in the future. |
| **PO-4** | Graduates will have clarity of thought and expression. Qualities like logical thinking and decision-making will be enhanced. |
| **PO-5** | Graduates plan and execute experiments or investigations, analyze and interpret data information collected using appropriate methods. |
| **PO-6** | Graduates will be able to compete in various national and international competitive examinations. |
| **PO-7** | Graduates will understand the principles of basic and applied sciences and apply them logically in environmental and socio-technological contexts with a systematic approach toward sustainable development. |
| **PO-8** | Graduates will have critical thinking, follow innovations and developments in science and technology. |
| **PO-9** | Graduates will acquire effective communication skills. |
| **PO-10** | Graduates will understand ethical principles and responsibilities for effective citizenship. |
| **PO-11** | Graduates will develop new and enhanced conversational skills that lead not only to good communication but also to excellent drafting abilities linked with technical reports and presentations. |
| **PO-12** | Graduates will be competent enough to do jobs in the government and private sectors of academia, research, and industry. |

**Program-specific outcomes (PSOs)**

| | |
|---|---|
| **PSO-1** | Students will gain foundational knowledge in Zoology, including the habits, habitats, morphology, anatomy, Physiology, reproduction, etc. of various animal groups. The program content also prepares them for competitive examinations in biological sciences. |
| **PSO-2** | Learners will acquire knowledge in molecular biology, evolutionary biology, systematics, public health & hygiene, etc. Laboratory work will enhance understanding of animal structure, organization, and applied zoological skills, enabling students to pursue careers in Zoology. |
| **PSO-3** | Graduates will develop a comprehensive understanding of animal systematics, ecology, biostatistics, physiology, biochemistry, cell biology, genetics, etc. Training & projects will nurture scientific aptitude and prepare students for higher education and research in animal sciences. |
| **PSO-4** | Graduates of the Honours/Research program will be equipped for careers as zoologists, ecologists, conservationists, or researchers in various organizations, government bodies, NGOs, and related industries and national institutes. |

## Credit Requirements and Qualifications at different levels on the NHEQF:

1. Credit Requirements and Qualifications at different levels on the NHEQF: The level of the four-year B.Com. The programme shall be as per the Draft National Higher Educational Qualification Framework (NHEQF). As per the guidelines, the numbers of credits to be earned at each level are as under:

| NHEQF Level | Nomenclature (qualifications within each level) | Credit earned without exit option | Credit earned with exit option |
|---|---|---|---|
| **Level – 5** | **Undergraduate Certificate** for those who exit after successful completion of the first year (two semesters) of the undergraduate programme | **44** | **48** |
| **Level – 6** | **Undergraduate Diploma** for those who exit after successful completion of the second year (four semesters) of the undergraduate programme | **88** | **92** |
| **Level – 7** | **Bachelor's Degree** for those who exit after successful completion of three years (six semesters) of the four-year undergraduate programme | **132** | **132** |
| **Level – 8** | **Bachelor's Degree with Honours** for those who have completed four years (eight semesters) of the undergraduate programme | **176** | **176** |
| **Level – 8** | **Bachelor's Degree Honours with Research*** for those who have completed four years (eight semesters) of the undergraduate programme | **176** | **176** |

**Examination Scheme**:

| Components | I$^{st}$ Internal | II$^{nd}$ Internal | External (ESE) |
|---|---|---|---|
| Weightage (%) | 15 Marks | 15 Marks | 70 Marks |

**ZOOLOGY UG COURSE STRUCTURE**

## Semester-Wise Discipline-Specific Core (DSC)

| Semester | Course Type | Course Code | Course Title | L | T | P | C |
|---|---|---|---|---|---|---|---|
| I | DSC (Zoology) | ZOODC101 | Non-Chordata | 3 | 0 | 0 | 3 |
| | | ZOODL102 | Lab Course (Based on ZOODC101) | 0 | 0 | 2 | 1 |
| II | | ZOODC201 | Chordata | 3 | 0 | 0 | 3 |
| | | ZOODL202 | Lab Course (Based on ZOODC201) | 0 | 0 | 2 | 1 |
| III | | ZOODC301 | Molecular Biology | 3 | 0 | 0 | 3 |
| | | ZOODL302 | Lab course (Based on ZOODC301) | 0 | 0 | 2 | 1 |
| IV | | ZOODC401 | Evolutionary Biology and Systematics | 3 | 0 | 0 | 3 |
| | | ZOODL402 | Lab Course (Based on ZOODC401) | 0 | 0 | 2 | 1 |
| V | | ZOODC501 | Biochemistry and Animal Physiology | 3 | 0 | 0 | 3 |
| | | ZOODL502 | Lab Course (Based on ZOODC501) | 0 | 0 | 2 | 1 |
| VI | | ZOODC601 | Cell Biology | 3 | 0 | 0 | 3 |
| | | ZOODL602 | Lab Course (Based on ZOODC601) | 0 | 0 | 2 | 1 |
| VII | | ZOODC701 | Genetics | 3 | 0 | 0 | 3 |
| | | ZOODL702 | Lab Course (Based on ZOODC701) | 0 | 0 | 2 | 1 |
| VIII | | ZOODC801 | Developmental Biology | 3 | 0 | 0 | 3 |
| | | ZOODL802 | Lab Course (Based on ZOODC801) | 0 | 0 | 2 | 1 |

## Semester-Wise Discipline-Specific Elective (DSE)

| Semester | Course Type | Course Code | Course Title | L | T | P | C |
|---|---|---|---|---|---|---|---|
| III | DSE | ZOODE303 | Animal Ecology | 3 | 0 | 0 | 3 |
| | | ZOODL304 | Lab Course (Based on ZOODE303) | 0 | 0 | 2 | 1 |
| IV | | ZOODE403 | Aquatic Biology | 3 | 0 | 0 | 3 |
| | | ZOODL404 | Lab Course (Based on ZOODE403) | 0 | 0 | 2 | 1 |
| V | | ZOODE503 | Instrumentation, Computer Application, and Biostatistics | 3 | 0 | 0 | 3 |
| | | ZOODL504 | Lab Course (Based on ZOODE503) | 0 | 0 | 2 | 1 |
| VI | | ZOODE603 | Reproductive Biology. | 3 | 0 | 0 | 3 |
| | | ZOODL604 | Lab Course (Based on ZOODE603) | 0 | 0 | 2 | 1 |
| VII (The student has to choose any four (for Hon.) /Three (for Hon. with Res.) elective theory papers and lab course based on it) | | ZOODE703 | Basic Immunology | 3 | 0 | 0 | 3 |
| | | ZOODL704 | Lab Course (Based on ZOODE703) | 0 | 0 | 2 | 1 |
| | | ZOODE705 | General Ichthyology | 3 | 0 | 0 | 3 |
| | | ZOODL706 | Lab Course (Based on ZOODE705) | 0 | 0 | 2 | 1 |
| | | ZOODE707 | Medical Laboratory Techniques | 3 | 0 | 0 | 3 |
| | | ZOODL708 | Lab Course (Based on ZOODE707) | 0 | 0 | 2 | 1 |
| | | ZOODE709 | Endocrinology & Animal Behaviour | 3 | 0 | 0 | 3 |
| | | ZOODL710 | Lab Course (Based on ZOODE709) | 0 | 0 | 2 | 1 |
| | | ZOODE711 | Research Methodology* | 3 | 1 | 0 | 4 |
| VIII (The student has to choose any four (for Hon.) /Three (for Hon. with Res.) elective theory papers and lab | | ZOODE803 | Applied Immunology | 3 | 0 | 0 | 3 |
| | | ZOODL804 | Lab Course (Based on ZOODE803) | 0 | 0 | 2 | 1 |
| | | ZOODE805 | Applied Ichthyology | 3 | 0 | 0 | 3 |
| | | ZOODL806 | Lab Course (Based on ZOODE805) | 0 | 0 | 2 | 1 |
| | | ZOODE807 | Basic Limnology | 3 | 0 | 0 | 3 |
| | | ZOODL808 | Lab Course (Based on ZOODE807) | 0 | 0 | 2 | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| course based on it) | | ZOODE809 | Biodiversity and Wildlife Conservation | 3 | 0 | 0 | 3 |
| | | ZOODL810 | Lab Course (Based on ZOODE809) | 0 | 0 | 2 | 1 |
| | | ZOODE811 | Research Publication and Ethics* | 3 | 1 | 0 | 4 |

*Mandatory for the Hons. with research.

### Semester-Wise Generic Elective

| Semester | Course Type | Course Code | Course Title | L | T | P | C |
|---|---|---|---|---|---|---|---|
| **I** | **GE (Zoology)**: For the students of other Departments | ZOOGE103 | Animal Diversity-I | 4 | 0 | 0 | 4 |
| **II** | | ZOOGE203 | Animal Diversity-II | 4 | 0 | 0 | 4 |
| **III** | | ZOOGE305 | Economic Zoology | 4 | 0 | 0 | 4 |
| **IV** | | ZOOGE405 | Apiculture | 4 | 0 | 0 | 4 |
| **V** | | ZOOGE505 | Pisciculture | 4 | 0 | 0 | 4 |
| **VI** | | ZOOGE605 | Wildlife Conservation & Management | 4 | 0 | 0 | 4 |
| **VII** | | ZOOGE712 | Animal Behaviour | 4 | 0 | 0 | 4 |
| **VIII** | | ZOOGE812 | Aquarium Fish Keeping | 4 | 0 | 0 | 4 |

## Semester-Wise Ability Enhancement Course

| Semester | Course Type | Course Code | Course Title | L | T | P | C |
|---|---|---|---|---|---|---|---|
| **I** | **AEC** | AEC-104 | Environment Science-I | 2 | 0 | 0 | 2 |
| **II** | | AEC-204 | Environment Science-II | 2 | 0 | 0 | 2 |
| **III** | | AEC-304 | English Communication-I | 2 | 0 | 0 | 2 |
| **IV** | | AEC-404 | English Communication-II | 2 | 0 | 0 | 2 |

## Semester-Wise Skill Enhancement Course/IAPC

| Semester | Course Type | Course Code | Course Title | L | T | P | C |
|---|---|---|---|---|---|---|---|
| **I** | **SEC/IAPCA (Zoology)** | ZOOSC105 | Public Health & Hygiene<br>OR<br>Internship/Apprenticeship / Project/ Community Outreach/MOOC. | 2 | 0 | 0 | 2 |
| **II** | | ZOOSC205 | Culture and management of Ornamental fishes<br>OR<br>Internship/Apprenticeship / Project/ Community Outreach/MOOC | 2 | 0 | 0 | 2 |
| **III** | | ZOOSC305 a/b | Apiculture/<br>Disaster Management<br>OR<br>Internship/Apprenticeship / Project/ Community Outreach/MOOC. | 2 | 0 | 0 | 2 |
| **IV** | | ZOOSC405 | Poultry Farming<br>OR<br>Internship/Apprenticeship / Project/ Community Outreach/<br>OR MOOC. | 2 | 0 | 0 | 2 |
| **V** | | ZOOSC507 | Sericulture<br>OR<br>Internship/Apprenticeship / Project/ Community Outreach/<br>OR MOOC | 2 | 0 | 0 | 2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **VI** | | ZOOSC607 | IPR<br>OR<br>Internship/Apprenticeship / Project/ Community Outreach/<br>OR MOOC | 2 | 0 | 0 | 2 |

## Seminar/Dissertation

| Semester | Course Type | Course Code | Course Title | L | T | P | C |
|---|---|---|---|---|---|---|---|
| **VII** | IAPC | ZOODT713 | Dissertation (Discipline-Specific)<br>(Mandatory for Hons. with research) | 0 | 0 | 0 | 6 |
| | | ZOODS714 | Seminar/ Academic Project/<br>Entrepreneurship (For Hons.) | 0 | 0 | 0 | 2 |
| **VIII** | IAPC | ZOODT813 | Dissertation (Discipline-Specific) | 0 | 0 | 0 | 6 |
| | | ZOODS814 | Dissertation (Discipline-Specific)<br>(Mandatory for Hons. with research) | 0 | 0 | 0 | 2 |

## Semester-Wise Value-Added Course

| Semester | Course Type | Course Code | Course Title | L | T | P | C |
|---|---|---|---|---|---|---|---|
| I | VAC | | Choose from the pool of courses offered by the University | 0 | 0 | 0 | 2 |
| II | VAC | | Choose from the pool of courses offered by the University | 0 | 0 | 0 | 2 |
| III | VAC | | Choose from the pool of courses offered by the University | 0 | 0 | 0 | 2 |
| IV | VAC | | Choose from the pool of courses offered by the University | 0 | 0 | 4 | 2 |