

**Proposed Course content under New Education Policy Year 2021-22 for I
Semester BSc Zoology**

Core Course Content

Course Title/Code: Cytology, Genetics and Infectious Diseases	Course Credits: 4
Course Code: DSCC5Z00T1	L-T-P per week: 4-0-0
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative AssessmentMarks: 40	Summative AssessmentMarks: 60
Model SyllabusAuthors:	

Course Outcomes (COs):

At the end of the course the student should be able to understand:

1. The structure and function of the cell organelles.
2. The chromatin structure and its location.
3. The basic principle of life, how a cell divides leading to the growth of an
4. Organism and also reproduces to form a new organisms.
5. How a cell communicates with its neighboring cells.
6. The principles of inheritance, Mendel's laws and the deviations.
7. How environment plays an important role by interacting with genetic factors.
8. Detect chromosomal aberrations in humans and study of pedigree analysis.

Zoology Core Lab Course Content

Semester I

Course Title: Cell Biology & Cytogenetics Lab	Course Credits: 2
Course Code: DSCC5Z00P1	L-T-P per week: 0-0-4
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 20	Summative Assessment Marks: 30
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to:

1. To use simple and compound microscopes.
2. To prepare stained slides to observe the cell organelles.
3. To be familiar with the basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form new organisms.
4. The chromosomal aberrations by preparing karyotypes.
5. How chromosomal aberrations are inherited in humans by pedigree analysis in families.
The antigen-antibody reaction.

Proposed Course content under New Education Policy – Year 2021-22

For II Semester BSc

Zoology Core Course Content

Course Title: Biochemistry and Physiology	Course Credits: 4
Course Code: DSCC5Z00T2	L-T-P per week: 4-0-0
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 40	Summative Assessment Marks: 60
Model Syllabus Authors:	

Course outcomes:

The student at the completion of the course will learn:

1. To develop a deep understanding of structure of biomolecules like proteins, lipids and carbohydrates.
2. How simple molecules together form complex macromolecules.
3. To understand the thermodynamics of enzyme catalyzed reactions.
4. Mechanisms of energy production at cellular and molecular levels.
5. To understand various functional components of an organism.
6. To explore the complex network of these functional components.
7. To comprehend the regulatory mechanisms for maintenance of function in the body.

Zoology Semester II Core Course Lab Content

Course Title/Code: Biochemistry and Physiology	Course Credits: 2
Course Code: DSCC5Z00P2	L-T-P per week: 0-0-4
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative AssessmentMarks: 20	Summative AssessmentMarks: 30
Model SyllabusAuthors:	

Course Outcomes (COs):

At the end of the course the student should be able to understand:
Basic structure of biomolecules through model making.
Develop the skills to identify different types of blood cells.
Enhance basic laboratory skill like keen observation, analysis and discussion.
Learn the functional attributes of biomolecules in animal body.
Know uniqueness of enzymes in animal body and their importance through enzyme kinetics.

**III Semester BSc Zoology
Core Course Content**

Course Title/Code: Molecular Biology, Bioinstrumentation & Techniques in Biology	Course Credits: 4
Course Code: DSCC5ZOOT3	L-T-P per week: 4-0-0
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 40	Summative Assessment Marks: 60
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to understand:

1. After successful accomplishment of the course, the learners will be able to acquire better understanding and comprehensive knowledge regarding most of the essential aspects of Molecular Biology subject which in turn will provide a fantastic opportunity to develop professional skill related to the field of molecular biology.
2. The course will mainly focus on the study of principal molecular events of cell incorporating DNA Replication, Transcription and Translation in prokaryotic as well as eukaryotic organisms.
3. Acquiring knowledge on instrumentation and techniques in biology.

Zoology

Core Course Lab Content

Semester III (Practical III)

Course Title: Molecular Biology, Bioinstrumentation and Techniques in Biology	Course Credits: 2
Course Code: DSCC5ZOOP3	L-T-P per week: 0-0-4
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 25	Summative Assessment Marks: 25

Course Outcomes (COs):

At the end of the course the student should be able to:

1. At the end of the course, students will be able to understand the applications of biophysics and principle involved in bio-instruments.
2. Understand the methodology involved in bio techniques.
3. Students can Demonstrate knowledge and practical skills of using instruments in biology and medical field.
4. They can perform techniques involved in molecular biology and diagnosis of diseases.

Semester IV- Zoology Core Course IV Content:

Semester: IV Semester, B. Sc., (Hons) Zoology

Course Title: Core Course Content: Gene Technology Immunology and Computational Biology	Course Code: DSCC5ZOOT4
Course Type: Discipline Core Theory, L-T-P: 4-0-0	Course Credits: 4
Total Contact Hours: 56	Duration of ESA: 3 Hrs.
Formative Assessment Marks: 40	Summative Assessment Marks: 60

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Acquaint knowledge on versatile tools and techniques employed in genetic engineering and recombinant DNA technology.
2. An understanding on application of genetic engineering techniques in basic and applied experimental biology.
3. To acquire a fundamental working knowledge of the basic principles of immunology.
4. To understand how these principles, apply to the process of immune function.
5. Use, and interpret results of, the principal methods of statistical inference and design; helps to communicate the results of statistical analyses accurately and effectively; helps in usage of appropriate tool of statistical software.

Semester: IV

Course Lab Content

Course Title: Gene Technology, Immunology and Computational Biology	Course Credits: 02
Course Type: Minor Discipline Core Practical, L-T-P: 0-0-4	Course Code: DSCC5ZOOP4
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 25	Summative Assessment Marks: 25
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Accurately, safely and appropriately use all the equipment regularly used in Molecular Biology (DNA manipulation, including balances, pipettes, electrophoresis and centrifuges).
2. Prepare chemical solution and reagents to the precision appropriate to the task.
3. Demonstrate knowledge of the biochemical basis underpinning the molecular biology techniques.

Paper V: Non-Chordates and Economic Zoology (Theory)

Program Name	B.Sc.	V Semester	
Course Title	Paper V: Non-Chordates and Economic Zoology (Theory)		
Course Code:	ZOOC	No. of Credits	4
Contact hours	60 Hours	Duration of SEA/Exam	2 1/2 hours
Formative Assessment Marks	40	Summative Assessment Marks	60

COURSE OUTCOME (COs):-

CO-1: Understand basics of classification of non-chordates. 2. 3CO-2: Learn the diversity of habit and habitat of these species.

CO-3: Develop the skills to identify different classes and species of animals.

CO-4: Know uniqueness of a particular animal and its importance.

Paper VI: Chordates and Comparative Anatomy (Theory)

Program Name	B.Sc.	Semester	V
Course Title	Paper VI: Chordates and Comparative Anatomy (Theory)		
Course Code:	ZOOC11-T	No. of Credits	4
Contact hours	60 Hours	Duration of SEA/Exam	2 ½ hours
Formative Assessment Marks	40	Summative Assessment	60 Marks

COURSE OUTCOME (Cos):

CO-1: To demonstrate comprehensive identification abilities of chordate diversity

CO-2: Able to explain structural and functional diversity of chordate diversity

CO-3: To understand evolutionary relationship amongst chordates

CO-4: To take up research in biological sciences.

CO-5: To realize that very similar physiological mechanisms are used in very diverse organisms.

CO-6: To Get a flavor of research by working on project besides improving their writing skills. It will further enable the students to think and interpret individually

Paper VII: Evolutionary & Developmental

Biology (Theory)

Program Name	B.Sc.	Semester	VI
Course Title	Paper VII: Evolutionary & Developmental Biology (Theory)		
Course Code:	ZOOC15-T	No. of Credits	4
Contact hours	60 Hours	Duration of SEA/ Exam	2 ½ hours
Formative Assessment Marks	40	Summative Assessment Marks	60

COURSE OUTCOME (Cos):

CO-1: Understand that by biological evolution we mean that many of the organisms that inhabit the earth today are different from those that inhabited it in the past.

CO-2: Understand that natural selection is one of several processes that can bring about evolution, although it can also promote stability rather than change.

CO-3: Understand how the single cell formed at fertilization forms an embryo and then a full adult, organism. Integrate genetics, molecular biology, biochemistry, cell biology, anatomy and physiology during embryonic development.

CO-4: Understand a variety of interacting processes, which generate an organism's heterogeneous, shapes, size, and structural features.

CO-5: Understand how a cell behaves in response to an autonomous determinant or an external signal, and the scientific reasoning exhibited in experimental life science.

Program Name	B.Sc.	Semester	VI
Course Title	Paper VIII: Environmental Biology, Wildlife Management & Conservations (Theory)		
Course Code:	ZOO C17-T	No. of Credits	4
Contact hours	60 Hours	Duration of SEA/Exam	Hours
Formative Assessment Marks	40	Summative Assessment Marks	60

COURSE OUTCOME (Cos):

CO-1: Develop an understanding of how animals interact with each other and their natural environment.

CO-2: Develop the ability to use the fundamental principles of wildlife ecology to solve local, regional and national conservation and management issues.

CO-3: Develop the ability to work collaborative team-based projects.

CO-4: Gain an appreciation for the modern scope of scientific inquiry in the field of wildlife conservation management.

CO-5: Develop an ability to analyze, present and interpret wildlife conservation Management in formation

PROGRAM OBJECTIVES (POs)

POs1-The Programme offers both classical as well as modern concepts of Zoology in higher education.

POs2-It enables the students to study animal diversity in both local and global environments.

POs3-To make the study of animals more interesting and relevant to human studies more emphasis is given to branches like behavioral biology, evolutionary biology and economic zoology.

POs4-More of upcoming areas in cell biology, genetics, molecular biology, biochemistry, genetic engineering and bioinformatics have been also included.

POs5-Equal importance is given to practical learning and presentation skills of students.

POs6-The lab courses provide the students necessary skills required for their employability.

POs7-Skill enhancement courses in classical and applied branches of Zoology enhance enterprising skills of students.

POs8- The global practices in terms of academic standards and evaluation strategies.

POs9- Provides opportunity for the mobility of the student both within and across the world.

POs 10-The uniform grading system will benefit the students to move across institutions within India to begin with and across countries.

POs11-It will also enable potential employers in assessing the performance of the candidates across the world.