

11/11/19

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RAGHUNATH GIRLS' POST GRADUATE COLLEGE

ZOOLOGY DEPARTMENT

TEACHERWISE COURSE ALLOTMENT AND LESSON PLAN FOR UG CLASSES.

B.Sc I SEM

Course- Cytology, Genetics and Infectious Diseases (B050101T)

Course Outcomes:


The student at the completion of the course will be able to:

- Understand the structure of the function of all the cell organelles.
- Know about the chromatin structure and it's location.
- 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.
- How one cell communicates with it's neighbouring cells?
- Understand the Mendel's laws and the deviations from conventional patterns of inheritance.
- Comprehend how environment plays an important role by interacting with genetic factors.
- How to detect chromosomal aberrations in humas and study the pattern of inheritance by pedigree analysis in families.

Name of teacher	Class/course	Course allotted	Work load (Total no of lectures)
Dr. Seema Jain	B.Sc 1 st sem code B050101T	Cytology, Genetics and Infectious diseases (unit VIII)	(08 Lectures)
Dr. Garima pundir	B.Sc 1 st sem code B050101T	Cytology, Genetics and Infectious diseases (unit V and unit VI)	(08 Lectures) (08 Lectures)
Dr. Shashi Bala	B.Sc 1 st sem code B050101T	Cytology, Genetics and Infectious diseases (unit I and unit II)	(06 Lectures) (06 Lectures)
Dr. Kalpana Chaudhary	B.Sc 1 st sem code B050101T	Cytology, Genetics and Infectious diseases (unit IV)	(08 Lectures)
Dr. Manju Singh	B.Sc 1 st sem code B050101T	Cytology, Genetics and Infectious diseases (unit III unit VII)	(08 Lectures) (08 Lectures)

Suggested Readings:

1. Lodish et al: Molecular Cell Biology: Freeman & Co, USA (2004).
2. Alberts et al: Molecular Biology of the Cell: Garland(2002).
3. Cooper: Cell: A Molecular Approach :ASM Press(2000).
4. Karp: Cell and Molecular Biology: Wiley(2002). Pierce B. Genetics. freeman (2004).
5. Lewin B. Genes VIII. Pearson (2004).
6. Watson et al. Molecular Biology of the Gene. Pearson (2004).


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RAGHUNATH GIRLS' POST GRADUATE COLLEGE

ZOOLOGY DEPARTMENT

TEACHERWISE COURSE ALLOTMENT AND LESSON PLAN FOR UG CLASSES.

B.Sc II SEM

Course - Biochemistry and Physiology (B050201T)

Course outcomes:

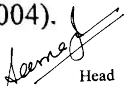
The student at the completion of the course will learn:

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

Name of teacher	Class/course	Course allotted	Work load (Total no of lectures)
Dr. Seema Jain	B.Sc 2 ND sem code B050201T	Biochemistry and Physiology, Unit V	(07)
Dr. Garima pundir	B.Sc 2 ND sem code B050201T	Biochemistry and Physiology, Unit VIII	(07)
Dr. Shashi Bala	B.Sc 2 ND sem code B050201T	Biochemistry and Physiology, Unit VII	(08)
Dr. Kalpana Chaudhary	B.Sc 2 ND sem code B050201T	Biochemistry and Physiology, Unit III	(08)
Dr. Manju Singh	B.Sc 2 ND sem code B050201T	Biochemistry and Physiology, Unit VI	(08)
Dr. Sangeeta Bajaj	B.Sc 2 ND sem code B050201T	Biochemistry and Physiology, Unit I	(08)
Ms. Sana Ansari	B.Sc 2 ND sem code B050201T	Biochemistry and Physiology, Unit II	(08)
Ms. Shivani	B.Sc 2 ND sem code B050201T	Biochemistry and Physiology, Unit IV	(06)

Suggested Readings:

1. Nelson & Cox: Lehninger's Principles of Biochemistry: McMillan (2000)
2. Zubayet *al*: Principles of Biochemistry: WCB (1995)
3. Voet & Voet: Biochemistry Vols 1 & 2: Wiley (2004)
4. Murray *et al*: Harper's Illustrated Biochemistry: McGraw Hill (2003) Elliott and Elliott: Biochemistry and Molecular Biology: Oxford University Press
5. Guyton, A.C. & Hall, J.E. Textbook of Medical Physiology. XI Edition. Hecourt Asia PTE Ltd. /W.B. Saunders Company. (2006).
6. Tortora, G.J. & Grabowski, S. Principles of Anatomy & Physiology. XI Edition John Wiley & sons (2006).
7. Christopher D. Moyes, Patricia M. Schulte. Principles of Animal Physiology. 3rd Edition, Pearson Education (2016).
8. Hill, Richard W., et al. Animal physiology. Vol. 2. Sunderland, MA: Sinauer Associates, (2004).
9. Chatterjee C C Human Physiology Volume 1 & 2. 11th edition. CBS Publishers(2016).


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RAGHUNATH GIRLS' POST GRADUATE COLLEGE

ZOOLOGY DEPARTMENT

TEACHERWISE COURSE ALLOTMENT AND LESSON PLAN FOR UG CLASSES.

B.Sc. II year

Course outcomes:

Paper I Chordata (B-220)

1. To be familiar with the habitat, morphology, anatomy, physiology and development of balanoglossus and amphipxus.
2. Know about the structure, physiology and embryonic development of Herdmania.
3. Comparative study of Pisces, Amphibia and Reptilia.
4. Know about characters of Aves and Mammalia with dentition in Mammals.

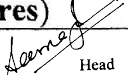
Paper II Animal distribution evolution and development (B-221)

1. To be familiar with the distribution of animals.
2. To study about evolutionary patterns of animals.
3. Explain different developmental stages.
4. Knowledge about placentation, extraembryonic membrane of chick.

Paper III Physiology and biochemistry (B- 222)

1. To understand systems biology and various functional components of an Organism.
2. To comprehend the regulatory mechanism for maintenance of function in the body.
3. To understand the thermodynamics of enzyme catalysed reaction.
4. To develop a deep understanding of structure of biomolecules like carbohydrate, lipid, and proteins

Name of teacher	Class course	Course allotted	Work load(Total no of lectures)
Dr. Seema Jain	B.Sc 2 ND year Paper III: code B222	Biochemistry and Physiology, Unit I and Unit II	(30 Lectures)
Dr. Garima pundir	B.Sc 2 ND year Paper I: code B220	Chordata , Unit I and Unit II	(30 Lectures)
Dr. Shashi Bala	B.Sc 2 ND year Paper II: code B221	Animal distribution, Evolution and Developmental Biology, Unit I and Unit IV	(30 Lectures)
Dr. Kalpana Chaudhary	B.Sc 2 ND year Paper I code B220	Chordata, Unit III and Unit IV	(30 Lectures)
Dr. Manju Singh	B.Sc 2 ND year Paper II: code B221	Animal distribution, Evolution and	(30 Lectures)


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		Developmental Biology, Unit II and Unit III	
Dr. Sangeeta Bajaj	B.Sc 2 ND year Paper III: code B222	Biochemistry and Physiology, Unit III and Unit IV	(30 Lectures)

Suggested readings

Paper I Chordata (B-220)


1. Romer and Parspns: The Vertebrate Body (6th edition 1996, CBS Publication Japan).
2. Parker and Haswell: Text Book of Zoology, Vol.II(1978, ELBS).
3. Kotpal, R.L : Modern Text Book of Zoology, Vertebrates.

Paper II Animal distribution evolution and development (B-221)

1. Colbert et al : Colberts evolution of the vertebrates a history of the backboned animals through time (5th ed 2002, Willey).
2. Developmental biology: From a cell to an organism (Genetics and evolution) e-book : Russ Hodge, Infobase Publishing 2009.
3. Dr. Veer Bala rastogi: organic evolution, Kedarnath Ramnath Publication, Meerut.

Paper III Physiology and biochemistry (B- 222)

1. Zubayet et al. Principal of biochemistry; WCB (1995).
2. Voet and voet: Biochemistry Vols 1 and 2: Willey (2004).
3. Nelson and cox: Lehninger's Principals of Biochemistry : MC Millan(2000).


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RAGHUNATH GIRLS' POST GRADUATE COLLEGE

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B.Sc III year

Course outcomes:

Paper-I (Applied and Economic Zoology) (B-320)

- Enable student to take up research in biological science especially in parasitology.
- To get employment in different applied sector.
- Two setup small scale industries in Aquaculture, Pisciculture, Poultry Sericulture, Apiculture and Lac culture.
- Knowledge about endangered species turn the student for the conservation of their habitat.

Paper II (Biotechnology, Immunology, Biological tools and techniques and Biostatistics)

- To understand Genetics Engineering and its application in agriculture and medical areas.
- Knowledge of body immune system for understanding of general body health and work opportunity in laboratories.
- Knowledge of various biological tools and techniques.
- To understand the basic biostatistics method line sampling, correlation and regression etc.

Paper III (Ecology, Microbiology, Animal behaviour and Pollination and Toxicology)

- Two understand the basic concept of ecology.
- To know the morphology, physiology and infection of bacteria and viruses.
- To understand the pattern of behaviour animal like taxes, reflexes, motivation etc.
- Knowledge of concept of environmental pollution and dose response relationship categories of toxic effects.

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Name of teacher	Class course	Course allotted	Work load(Total no of lectures)
Dr. Seema Jain	B.Sc 3rd year Paper I: code B320	Applied and Economic Zoology. Unit II and Unit III	(30 Lectures)
Dr. Garima pundir	B.Sc 3rd year Paper II: code B321	Biotechnology, Immunology, Biological Tools and Techniques and Biostatistics. Unit III and Unit IV	(30 Lectures)
Dr. Shashi Bala	B.Sc 3rd year Paper I: code B320	Applied and Economic Zoology. Unit I and Unit IV	(30 Lectures)
Dr. Kalpana Chaudhary	B.Sc 3rd year Paper III: code B322	Ecology, Microbiology, Animal Behaviour and Pollution and Toxicology. Unit III and Unit IV	(30 Lectures)
Dr. Manju Singh	B.Sc 3rd year Paper III: code B322	Ecology, Microbiology, Animal Behaviour and Pollution and Toxicology. Unit II and Unit III	(30 Lectures)
Ms. Shivani	B.Sc 3rd year Paper II: code B321	Biotechnology, Immunology, Biological Tools and Techniques and Biostatistics. Unit I and Unit II	(30 Lectures)

Suggested readings

Paper-I (Applied and Economic Zoology) (B-320)

1. Bisht, D.S. Apiculture, ICAR publication.
2. Santanam, B. et al, A Manual of freshwater aquaculture.
3. Shetty Nandini, Immunology introductory textbook. New Age International (2005)
4. Parasitology- Chatterjee
5. Robert Leo Smith, Ecology and field biology, Harper and Row publisher Ecology, Odum

Paper II (Biotechnology, Immunology, Biological tools and techniques and Biostatistics)

1. Primose Molecular Biotechnology. Penima (2001)
2. Kuby Immunology P. Jenny punt sheron strandford Patricia Jones Juclith a owen VIII edition.
3. Biostatistical Analysis (forth edition) by GWWSnedecor and W.G. Cochran, Willey Blackwev
4. Westhead et al Bioinformatics : instant Notes. viva Books (2003)
5. Sudbery Human Mol. genetics practice-hall (2002)

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Paper III (Ecology, Microbiology, Animal behaviour and Pollination and Toxicology)

1. Ecology theories and Application peter stiling, 2001 printice Hall
2. Prescott, Microbiology, 11th edition Joanne Willey Kathleen sandman Dorothy Wood.
3. Animal behaviour : An evolutionary Approaches 9th edition (2009) John Alcock Paperback.
4. Casarett and doull's : Toxicology : The Basic science of poison 8TH edition (2013)

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ZOOLOGY DEPARTMENT
TEACHERWISE COURSE ALLOTMENT AND LESSON
PLAN FOR PG CLASSES.

Course Outcomes

SEM - I

Course I H-1062 Economic Zoology and Animal Behavior

- Understand the biological diversity and grade of complexity of various animal forms through their systematic classification and comparative structure studies. It helps us categorize organisms so we can more easily communicate biological information. Taxonomy uses hierarchical classification as a way to help scientist understand and organize the diversity of life on our planet. Economic Zoology deals with the application of zoology knowledge for the benefit of mankind. It is a specialized branch of zoology which deal with animal world that is associated with the economy, health and welfare of humans. It include culturing animal for mass production for human use and control or eradicate animals that are injurious to man directly or indirectly.

Course II H-1063 Evolutionary Biology

- Understand that by biological evolution we mean that many of the organism that inhabit the earth today are different from those that inhabited it in the past understand that natural selection is one of several process that can bring about evolution knowledge about various tools in phylogeny, molecular clock, distribution of animals with space and time to opt an carries in research knowledge of evolutionary process help in forensic science studies.

Course III H-1064 Non-Chordates

- Demonstrated comprehensive identification abilities of non-chordates diversity
- Explain structural and functional diversity of non- chordates
- Explain evolutionary relationship amongst non- chordates groups
- Get employment in different applied sections
- Students can start their own business i.e. self-employment.
- Enable students to take up research in biological sciences

Course IV H-1065 Cell and Molecular Biology

- Know about the structure and functions of all the cell organelles in detail.
- How one cell communicates with its neighboring cells

- Understand the structure and function of DNA as well as different types of RNA Clear understanding of the process like Transcription and Translation at molecular level in Prokaryotes as well as in Eukaryotes.
- Learn about different methods of DNA Replication

Name of teacher	Class/course	Course allotted For Ist Semester	Work load (Total no of lectures)
1. Dr. Seema Jain	Course 1: Economic zoology & Animal Taxonomy. Code: H-1062	Unit : I, II & V(b)	30 lectures
2. Garima Pundir	Course 1: Economic zoology & Animal Taxonomy. Code: H-1062	Unit :III, IV &V(a)	30 lectures
3. Dr. Shashi Bala	Course II : Evolutionary Biology. Code: H-1063	Unit : I, II & III(a)	30 lectures
4. Dr. Kalpana Chaudhary	Course IV : Cell & Molecular Biology. Code: H-1065	Unit : III, V & I(a)	30 lectures
5. Dr. Manju Singh	Course III Non-Chordata Code: H-1064	Unit : IV, V & I(a)	30 lectures
6. Dr. Sangeeta Bajaj	Course II : Evolutionary Biology. Code: H-1063	Unit : IV,V & III(b)	30 lectures
7. Ms. Shivani	Course III Non-Chordata Code: H-1064	Unit : II,III& I(b)	30 lectures
8. Ms.Sana Ansari	Course IV: Cell & Molecular Biology. Code: H-1065	Unit : II,IV& I(b)	30 lectures

Suggested Readings

Course I H-1062 Economic Zoology and Animal Behavior

1. Principles of Animal Taxonomy by Ashok Verma (2015)
2. Principle and practices of animal Taxonomy by Vijay Chandra Kapoor (1998).
3. Principle of Animal taxonomy by George Gaylord Sympton(1961)

Course II H-1063 Evolutionary Biology

1. Ridley, M. (2004).Evolution III edition Black well publishing.

2. Barton, N.H., Briggs, D.E.G., Eisen, J.A., Goldstein, D.B. and Patel, N.H. 2007. Evolution cold spring, harbor laboratory press.
3. Evolutionary biology by Veer Bala Rastogi
4. R.S. Lull: Organic evolution

Course III H-1064 Non-Chordates

1. Barends et al. 2009 The invertebrates: A synthesis. Wiley Becknell 17
2. Hunter: life of Invertebrates (1979), Collier Macmillan.
3. Marshall: Parker and Haswell Text Book of Zoology, Vol.1 (7th Edition 1972, Macmillan)
4. Han Pechenik (2014) Biology of the Invertebrates McGraw Hill.

Course IV H-1065 Cell and Molecular Biology

1. Lodish et al.: Molecular cell Biology Freeman and Co USA (2004).
2. Albert et al. molecular biology of the cell: Garland (2002).
3. Cooper: Cell: A Molecular biology Wiley (2002) Pierce B. Genetics. Freeman.

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Sem II

Course outcomes:

Course V H-2062 Biostatistics and Bioinformatics

The goal of Biostatistics is to disentangle the data received and make valid inference that can be used to solve problems in public health. Biostatistics uses the application of statistical method to conduct research in the areas of biology, public health and medicine.

Bioinformatics combine different fields of study, including computer sciences, molecular biology biotechnology, statistics and engineering. It particularly useful for managing and analyzing large sets of data such as those generated by the fields of genomics and proteomics.

Course VI : Genetics (H-2063)

- Understand the basic principle of genetics and how genes (earlier called factors) are inherited from one generation to another.
- Understand the Mendel's law and the deviation from conventional patterns of inheritance.
- Comprehend how environment played an important role by interacting with genetic factors.
- How to detect chromosomal aberration in human and study the pattern of inheritance by Pedigree analysis in families.

Course VII , Mammalian Physiology (H-2062)

Outcomes

- To understand systems biology and various functional components of an organism.
- To explore the complex network of this functional components.
- Two comprehend the regulatory mechanism for maintenance of function in the body.
- Understanding of different hormone controlling the behaviour of animals.

Course VIII : Biochemistry H-(2065)

Outcomes

- To develop our deep understanding of structure of bio molecules like proteins, lipids and carbohydrates.
- How simple molecules together form complex macromolecules.

- To understand thermodynamics of enzyme catalyzed reactions.
- Mechanism of energy production at cellular and molecular levels.

Name of teacher	Class/course	Course allotted For IInd Semester	Work load (Total no of lectures)
1. Dr. Seema Jain	Course VII: Mammalian physiology. Code: H-1062	Unit : I, II & III(a)	30 lectures
2. Garima Pundir	Course V: Biostatistics and Bioinformatics. Code: H-2062	Unit :I, II & V	30 lectures
3. Dr. Shashi Bala	Course V: Biostatistics and Bioinformatics. Code: H-2062	Unit : III & IV	30 lectures
4. Dr. Kalpana Chaudhary	Course VIII : Biochemistry Code: H-2065	Unit : IV & V	30 lectures
5. Dr. Manju Singh	Course VI : Genetics Code: H-2063	Unit : I, III & IV (a)	30 lectures
6. Dr. Sangeeta Bajaj	Course VI : Genetics Code: H-2063	Unit : II, V & IV (b)	30 lectures
7. Ms. Shivani	Course VII: Mammalian physiology. Code: H-2064	Unit : IV, V & III(b)	30 lectures
8. Ms. Sana Ansari	Course VIII : Biochemistry Code: H-2065	Unit :I, II & III	30 lectures

Suggested Readings

Course V: H-2062 Biostatistics and Bioinformatics

1. Bioinformatics for dummies, Claverie J.M. Notredame C., (2nd ed. 2007) Wiley publishing, Inc New York, U.S.
2. Principles of Biostatistics Pagano M gauvreaux K (2000) Duxbury press USA.
3. Bioinformatics sequence and genome analysis, Mount D.W. (2nd Ed 2001). Cold spring harbor Labor. Press

Course VI : Genetics (H-2063)

1. Alberts, B., Johnson, J. Lewis, M Raff, K. Roberts and P. Walter, 2002 : Molecular biology of the cell, Garland science, New York.
2. Altenburg, E. 1965 : Genetics : Oxford and IBH Publishing Co, Calcutta.
3. Brown, T.A. 1998 : Genetics: A Molecular approach, Nelson thornes Ltd. Cheltenham.

- (6)
4. Dubey, R.C., 2002 Biotechnology, S. Chand and Company Ltd. New Delhi

Course VII , Mammalian Physiology (H-2062)

1. Guyton, A.C and hall, J.E. Textbook of medical physiology. XI edition. Hercourt Asia PTE ltd . W.B. Saunders company. (2006)
2. Tortora, G,J. And Grabowski, S. Principle of Anatomy and physiology XI addition John Wiley and sons (2006)
3. Hill, Richard W. , et al. Animal Physiology. Vol 2 Sundarlandma: Sinauer Association (2004)
4. Chatterjee CC Human Physiology. Volume 1 and 2, 11th edition. CBS publication (2016)

Course VIII : Biochemistry H-(2065)

1. Nelson and cox: Lehninger's Principal of Biochemistry Mc Millan (2000)
2. Zubayet al: principal of biochemistry : WCB (1995)
3. Voet and Voet: Biochemistry volume 1 and 2: Wilay (2004)
4. Murray et al : Harpe''s illustrated Biochemistry : McGraw Hill (2003) Elliott and Elliott : Biochemistry and Molecular Biology : Oxford University Press.

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Sem III

Course outcomes

Course IX H-3062 Chordates

- Demonstrate comprehensive identification abilities of chordates diversity.
- Explain structural and functional diversity of chordates.
- Explain evolutionary relationship amongst chordates.
- Take up research in biological sciences.

Course -X H-3063 DEVELOPMENTAL BIOLOGY

- -Introduction to history background and theories of development.
- To understand the concept and types of parthenogenesis
- -Knowledge of basic concepts of development.
- To understand gametogenesis and fertilization.
- To know / to understand early development [cleavage,blastulation]
- To understand the concept of gastrulation and movement involved in it
- To understand concept of metamorphosis and regeneration.
- Introduction to causes and control of ageing through genes and ageing.
- To understand the concepts of abnormal development [teratology and neoplasia].

COURSE- XI-H-3064 ENVIRONMENTAL BIOLOGY

- Define the basic rule and concepts of the ecology science.
- 2. Define the ecology of population , community and ecosystem.
- Define all biotic and abiotic factors.
- Define the ecosystem.
- Define the ecological succession- Hydrosere,Xerosere and lithosere.
- Define food chain, food web ,energy flow ,trophic levels and ecological niche.
- Get knowledge about ecology, identify the ecosystems by experiencing and see the working field by
- joining technical excursions when the students became environmentalist. they learn that their aim of duty is nature and living thing and they always make plans how to contribute to the earth ecosystem in a good way.

Course- XII H-3065 ANIMAL BEHAVIOUR

- Understanding animal behaviour can be important in animal training.
- Considering the natural behaviour of different species or breeds enables trainers to select the individuals best suited to perform the required task.

- By knowing the behaviour of animals students can get first clues or early warning signs of environmental degradation.
- Field studies of natural behaviour of animals are vital to provide baseline data for environmental monitoring.
- Provide knowledge to students that how animals interact with each other or their environment.
- Students acquire knowledge of key concepts, principals and overarching themes in animal behaviour, cognition, conservation, welfare as well as research methods.

Name of teacher	Class/course	Course allotted For IIIrd Semester	Work load (Total no of lectures)
1. Dr. Seema Jain	Course IX Chordata. Code: H-3062	Unit : I, II & III(1/2)	30 lectures
2. Garima Pundir	Course XI Environmental Biology Code: H-3064	Unit :I, II	30 lectures
3. Dr. Shashi Bala	Course X Developmental Biology Code: H-3063	Unit : IV , V & (1) C	30 lectures
4. Dr. Kalpana Chaudhary	Course XII : Animal Behaviour Code: H-3065	Unit : IV, V & III (b)	30 lectures
5. Dr. Manju Singh	Course XI Environmental Biology Code: H-3064	Unit : III, IV & V	30 lectures
6. Dr. Sangeeta Bajaj	Course IX Chordata. Code: H-3062	Unit : IV, V & III(1/2)	30 lectures
7. Ms. Shivani	Course XII Animal Behaviour Code: H-3065	Unit : I, II & III(a)	30 lectures
8. Ms. Sana Ansari	Course X Developmental Biology. Code: H-3063	Unit :II , III & I(a,b)	30 lectures

Suggested readings

Course IX H-3062 Chordates

1. Harvey *et al.* The vertebrate life (2006)
2. Colbert et al: Colbert,s Evolution of the vertebrates: A history of the back boned animals through time(5th ed.2002, wiely -Liss).
3. Hildebrand: analysis of vertebrates structures (4th ed.1995, John wily)
4. Parker and haswell: Textbook of Zoology, Vol.II 1978, ELBS)

5. Young: The life of Vertebrates (3rd ed. 2006, ELBS/ Oxford

Course -X H-3063 DEVELOPMENTAL BIOLOGY

- 1. Developmental Biology - From a cell to an organism [Genetics and Evolution] e-book Russ Hodge, mfo base Publication 2009.
- 2. Dr. Veer Bala Rastogi - Organic evolution , Kedarnath Ramnath Publication , Meerut.
- 3. Developmental Biology - Twelfth Edition , BARRESI , GILBERT.

COURSE- XI-H-3064 ENVIRONMENTAL BIOLOGY

- 1. ECOLOGY: Theories & Applications, Peter D. Stiling, 2001, Prentice Hall.
- 2. ELEMENTS OF ECOLOGY: T.M. Smith and R.L. Smith, 2014, Pearson Education Inc.
- 3. FUNDAMENTALS OF ECOLOGY: E.P. Odum & Grey. W. Barrett, 1971, Saunders.
- 4. Hunter M.L. Gibbs, J.B. and Sterling, E.J. (2008). Problems solving in conservation biology and wildlife management. Exercise for class, field and laboratory Blackwell Publishing.
- 5. Sutherland, W.J. (2000). the conservation handbook: Research, Management and Policy. Blackwell Sciences.

Course- XII H-3065 OUTCOME ANIMAL BEHAVIOUR

- 1. An Introduction to Animal Behaviour (6th edition) Aubrey Manning and Marian Stamp Dawkins, Cambridge University press.
- 2. Animal behaviour: An Evolutionary Approach, 9th edition. John Alcock, Sinauer Associate Inc; USA, 2009.
- 3. Animal behaviour (11th Edition). Dustin R Rubenstein and John Alcock, Sinauer Associate Inc; USA, 2018.
- 4. Animal behaviour (Ethology) or V.K Agarwal S.Chand Publications.

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M.Sc IV SEM

COURSE OUTCOMES

Course-XIII- B. (H-4066) General Fish Biology

- A through knowledge fish diversity, distribution and habitat requirement is helpful to the student for management of fisheries conservation of species.
- Study about migration in fishes will lead to a greater knowledge for exotic fishes.
- Understanding of coloration in fishes.
- Knowledge about endo and exo skeleton of fishes helpful in identification taxonomic position of fishes.

Course XIV-B Morphology and Physiology of Fishes (H- 4067)

- The external anatomy of fish can reveal of great deal about where and how it lives.
- Morphological awareness is important for the knowledge of fish habitat and its taxonomic position.
- Knowledge of fish reproduction will have direct benefit in captive maturation, breeding and quality seed production in fish.
- By studying the adaptation in fishes helpful informing of different fishes
- Such physiological studies provide many valuable inside to inform fish conservation and management

Course XV Fish culture and importance of fishery science (H-4068)

- The aspect of fish culture practice involved the use of organic manure and inorganic fertilizers in phytoplanton production that is a part of agriculture practice
- Knowledge of fish culture helpful in resource conservation food production economic value if student become fish farmer in future
- This study is helpful to set up a home industry aquarium maintenance fish farm
- To boost Indian economy by exporting the fish.

Course XVI-B H 069 Applied Fisheries

- Student gain knowledge that fisheries and aquaculture provide food for hundreds of millions of people around the world every day but which one is suitable by knowing about fish pathology. Helping to identifying appropriate policies and management strategies and ensuring that management and policy making and learning process.
- It explore the interaction among fish population, the Environment and human.

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- Students as a Fisheries researchers confront issues ranging from managing harvest of Fish populations to developing novel approach for culturing finfishes and shellfish.
- Help in solving practices problems of fish production and increasing productivity.
- Fishery management aims to preserve economic value of a fish.

Name of teacher	Class/course	Course allotted For IVth Semester	Work load (Total no of lectures)
1. Dr. Seema Jain	Course XV B Fish Culture & Importance of fishery Science. Code: H-4068	Unit : I, II & III	30hrs
2. Garima Pundir	Course XIV B Morphology & Physiology of fishes. Code: H-4067	Unit :I, II & V(a)	30hrs
3. Dr. Shashi Bala	Course XIII B General Fish Biology. Code: H-4066	Unit : II, V & IV (b)	30hrs
4. Dr. Kalpana Chaudhary	Course XVI B : Applied Fishries Code: H-4069	Unit : I, II & V	30hrs
5. Dr. Manju Singh	Course XVI B : Applied Fishries Code: H-4069	Unit : III, IV	30hrs
6. Dr. Sangeeta Bajaj	Course XIV B Morphology & Physiology of fishes. Code: H-4067	Unit : I, III & IV (a)	30hrs
7. Ms. Shivani	Course XV B Fish Culture & Importance of fishery Science. Code: H-4068	Unit : I, III & IV(a)	30 hrs
8. Ms. Sana Ansari	Course XIII B General Fish Biology. Code: H-4066	Unit :II, IV & V(b)	30 hrs

Suggested readings

Course-XIII- B. (H-4066) General Fish Biology

1. Berg, L.S., 1947, Classification of fishes both recent and fossils. (English and Russian)
2. Chandy, M. (1992). Fishes: National Book trust, India
3. Khanna, S.S. (1970) An introduction of fishes, Central Book Department Allahabad, India
4. Lagler, K.F. Bardach, J.E. Miller, R.R. and Passino, D.M (1977)
5. Ichthyology (second edition) John Wiley and sons, New York.

Course XIV-B Morphology and Physiology of Fishes (H- 4067)

1. Gunther, A. 1980 An introduction to the study of fishes, A and C black edinburgh
2. Godrich E.S 1909 cyclostoms and fishes London
3. Khanna SS 1970 and introduction to fishes central book department Allahabad India
4. Lawson 1964, lung and swim bladder school science, review ,45,386-90
5. Day F. 1978, the fishes of India being a natural history of the fishes known to inhabit the seas and freshwater of India Burma and Celon volume 1 and second

Course XV Fish culture and importance of fishery science (H-4068)

1. Alikunhi K.H and shakunmaranK.K 1971 studies on the composite fish culture production by compatible combinations of Indian and Chinese carp,J Ind. fish association.
2. Kennedy m 1992 fishes National Book trust India
3. Dawes J.A 1984 the freshwater aquarium Robert royale Ltd London
4. Hour, W.S and Randell, D.J 1969 volume 1 and 4th academic place New York
5. Parihar R.P 1996 A textbook of fish biology and Indian fisheries Central publishing house Allahabad India
6. Srivastava J.G 1968 fishes of eastern UP and Bihar Vishvavidyala Prakashan Varanasi India. the Marine product export development authority, marine product export review 1980 Cochin India 1983

Course XVI-B H 069 Applied Fisheries

1. Jhingran, V.G 1982 fish and fisheries of India, Hindustan publication corporation India
2. SrivastavaC.B.L 1988, A textbook of fishery science and Indian fisheries, kitab Mahal Allahabad India
3. Agarwal SC 1994 fishery management, Ashish publishing house New Delhi, 462 PP
4. Conroy, D.A Harman, R.L Cop ED 1997. Textbook of fish disease, nirendra publication House New Delhi 302 PP