



II. Zoology

1.

Syllabus

2.

Field Visit – B.Sc. – I, II, III

2015-16

Study Tour

2016-17

Bird Watching

2017-18

Trail And Bird Survey

2018-19

**Seedball Preparation & Sowing
Programme**

E. Histological Slides :- Amphioxus, Frog, Rat

Slides :

Amphioxus :	T.S, Oral hood, Pharynx, Tail
Frog :-	T.S. lung, Stomoch, Kidney, T.S. Intestine,
Rat :-	T.S. Liver, Pancrease, Ovary, Testies, Pituitary, Thyroid, Adrenal

**DISTRIBUTION OF MARKS FOR
PRACTICALEXAMINATION.**

1. Dissection: -	10
2. Permanent stained micro preparation.	05
3. Spotting. (Specimens, Slides, bones, fossil)	10
4. Practical on evolution -	10
5. Class record	05
6. Viva - Voce	05
7. Submission of study tour report.	05
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Total Marks:	50
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BSc.II Semester IV

ZOOLOGY

There shall be the following paper and practical for B.Sc. Part-II Semester IV examination. The syllabus is based on 6 theory periods and six practical periods per week (Total 75-80 theory sessions and 24 practical sessions) during the complete semester. There shall be one compulsory theory paper of 3 hours duration the semester, as stated below and a practical examination extending for four hours. Every examinee shall offer the following paper of 100 marks (80 for written examination and 20 marks for internal assessment) and a practical examination of 50 marks (25 marks for written and 25 marks for practical examination).

Semester IV

	Marks Allotted
1) Paper-I: Advanced Genetics and Animal Ecology.	
Written examination.....	80
Internal assessment	20
2) Practical:	50
Total:	150 Marks

**ZOOLOGY Paper 4 S
ADVANCED GENETICS AND ANIMAL ECOLOGY**

UNIT I : Concept of genes.

Mendel's laws of hereditary – Monohybrid – Laws of dominance, law of segregation. Dihybrid cross – Law of independent assortment. Interactions of genes: , Supplementary factor, complementary factor, duplicates factor, inhibitory factors, and lethal factors – dominant and recessive.

UNIT II : **Linkage** - Types of linkage, linkage group, arrangement of linked genes, and significance of linkage.

Crossing over – Mitotic and meiotic crossing over, Mechanism of crossing over, theories of crossing over – Darlington's theory, breakage and exchange theory, and copy choice theory. Types of crossing over – Single, double and multiple crossing overs. Factors affecting crossing over, Significance of crossing over.

Multiple alleles. Multiple alleles in relation to eye color in *Drosophila*. Blood group in man, Erythroblastosis foetalis

UNIT III : **Sex determination:** Autosomes and sex chromosomes, Sex determination in animals, Chromosomal Theory, Genic Balance Theory. Environmentally and hormonally controlled sex determination, Gynaandromorphs.

Genetic disorders: Sickle cell anemia, Huntington's chorea, Diabetes mellitus, Non-disjunction, Turner's syndrome, Klinefelter's syndrome, Down's syndrome Edwrd's

Syndrome, Biochemical genetics: Cystic fibrosis, Phenylketonuria, Albinism, Alkaptonuria, Goiters, cretinism. Sex linked genetic disorders and their inheritance in man. Hemophilia and color blindness.

UNIT IV : Genetic Screening and parental diagnosis: - Parental Carrier, Predictive, CVS (Chorionic Villous Sampling), Amniocentesis, Gene probe and DNA analysis. Genes in Human Heredity: - Inheritance of eye color. Skin color. Recessive genes and consanguineous marriages. Genetic counseling: - Risk of marriages in affected family. Birth control measures (male and female).

Kinds of twins: - Identical, Fraternal, Siamese twins. Significance of twins study

UNIT V : Ecology: concept and scope:

Abiotic factors:

Water: Properties, water problem in terrestrial and aquatic habitat. **Temperature:** Temperature range, Temperature tolerance, Effects of temperature on animals. Homeotherms, poikilotherms. Dormancy, hibernation, aestivation & diapause. **Light:** Spectral

distribution, Biological effects of light on aquatic and terrestrial animals: Reproduction, Metamorphosis, pigmentation, vision, photo kinesis, phototropism, photoperiodism, migration.

Biotic factors:

Intra specific and interspecific associations, Predation, parasitism, Antagonism, commensalisms, mutualism, competition, (Gauze's Principle).

UNIT VI : Ecosystem: Relationship between habitat and ecological niche - Autotrophic and heterotrophic producer, consumer - trophic level - energy flow in an ecosystem - food chain food web - pyramids - Ecotypes. Homeostasis of ecosystem.

Terrestrial ecosystem: Classification and Biomes, Aquatic ecosystem: Fresh water ecosystem Lentic and lotic ecosystem.

Marine ecosystem: Characteristics, salinity, temperature - pressure, zonation and stratification Estuarine ecology: Characteristics types, fauna and their adaptations.

REFERENCE BOOKS:

1. Cell Biology, Genetics, Molecular Biology, Evolution & Ecology - P.S.Verma & V.K.Agrawal.
2. Principles of Genetics - S.K.Jain
3. Genetics - P.K.Gupta
4. Applied Genetics - C.Prmanuol.
5. Genetics: M.W.Strickberger, New York.
6. Principles of Genetics: Sinnott, Dunn and Dobzansky.
7. Principles of Genetics: Edidon Gardner.
8. Genetics. Verma, P.S. and V.K. Agarwal.. S.Chand & co. New Delhi
9. Gene VI .Lewin, B. 1998. Wiley Eastern Ltd., New Delhi.
10. Human Genetics. Rothwell, N.V.1979. Prentice Hall of India, New Delhi

Practical:-

Two practical per week of 3 periods duration. Examination shall be of 5 Hrs. duration and of 50 marks.

A) Genetic experiments:

1. Recording of Mendelian traits in man.
2. Detection of monohybrid and dihybrid cross with the help of piastic beads.
3. Culturing *Drosophila* using standard methods. *Drosophila* - male and female identification, Mutant forms (from pictures)
4. Demonstration of bar bodies.
5. Preparation of human Karyotypes from Xerox pictures.
6. Photo slides for, Turner's syndrome, Klinefelter's syndrome, Down's syndrome
7. Detection of syndrome from chromosome spread picture.
8. Study of following human genetic traits and application of Hardy-Weinberg Principle to them. Baldness, length of index and ring Finger, attached and free earlobes, rolling of tongue, PTC taste. Other notable traits

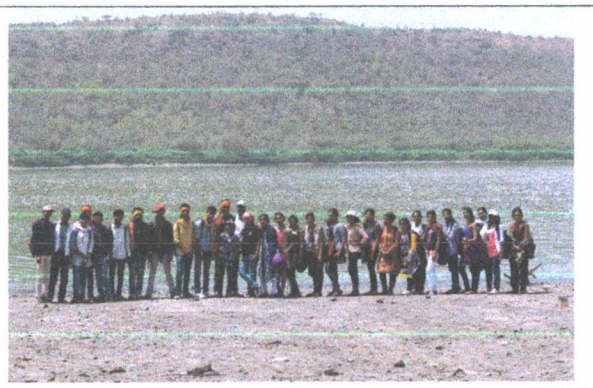
Study tour at Muktagiri:

Department of Zoology has organized one day study tour for B.Sc.I & II year students at Muktagiri for the observation of biodiversity in that area on 02nd September 2015.



Study tour at Lonar Sanctuary :

Department of Zoology has organized one day study tour for B.Sc.II year students at Lonar Sanctuary for the observation of biodiversity in that area on 19th March 2016.



Study tour 2015-16

Organized one day study tour of B.Sc. III at Fish Seed Production Centre Mahan on 22/08/2015 for the observations of induced breeding in fishes, Chinese circular hatchery, Indian Major Carps, Exotic carps, types of ponds etc.



P. S. Dhabe

Dr. P. S. Dhabe

HOD

Dr. P. S. Dhabe

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Science & Commerce College,
AKOLA.

Field Visit: B.Sc.I year

field visit of B. Sc. I Sem I (Zoology) was arranged on 5th October 2019 to study the ecosystem and biodiversity at **Katepurna Wild life Sanctuary**.



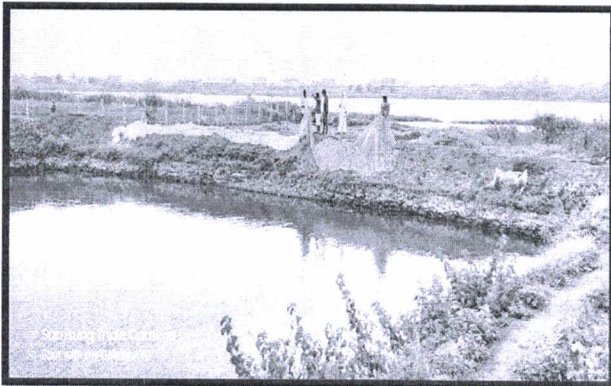
Field Visit: B.Sc.II year



Study tour for Bird watching at Lonar Crater Sanctuary for students of B. Sc. Sem IV on

12 February 2020

B.Sc. III year field visit on 22/08/2019



Department of Zoology organized study tour of Sem -V at Kumbhari fish Seed production centre near Akola.

Session 2016-17

Organised Nature Trail and Bird Survey for students of Zoology department as a field training experience organised by Divisional Forest office Wildlife Akola on 7th February 2016
<https://www.facebook.com/milind.shirbhate/posts/954185187970370>



Session 2017-18

Field Experience of Bird watching to the students of B. Sc. Zoology at Katepurna Wildlife Sanctuary on the occasion of Birth Anniversary of Dr. Salim Ali organised by Forest department on 12 November 2017.

<https://www.facebook.com/milind.shirbhate/posts/1489879317734285>



Session 2017-18

Nature trail and Field Workshop on Arachnology (Spider survey) was arranged for B. Sc. III Zoology Students with special focus on Spiders at Katepurna Sanctuary jointly organised by Forest Department, Akola and Nisargakatta Akola. Whole activity was Research based & scientific. All the participants & students learned different techniques to study Arachnology in the field on 10 September 2017.

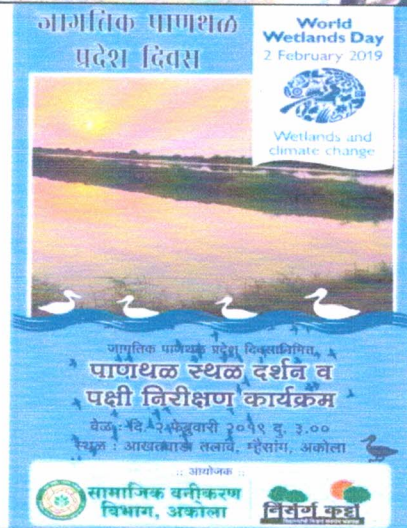
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Session 2018-19

Students of B. Sc. II Zoology observed Birds at Aakhatwada Reservoir near Mhaisang village of Akola district on the occasion of World Wetland Day. So many Migratory birds were observed by the students during the visit like Bramny duck 10, River tern 2, cormorant 11 etc. Senior birdwatcher Mr. Deepak Joshi, Mr. Amol Sawant, Dr. Harish Malpani told the information about purity of water and importance of algae in water, Dcf. Mrs. Leena Ade gave information about the site and various activities like challenges before the department. DYcf. Mr Mane also worked hard for making this place. Mr Amol Sawant founder of Nisargakatta gave information about Wetland Day celebration there and also suggested some conservation measures. Dr. Milind Shirbhate from Shankarlal Khandelwal College, Akola with his 11 of B. Sc. II Zoology students were present for the event on 2 Feb 2019.

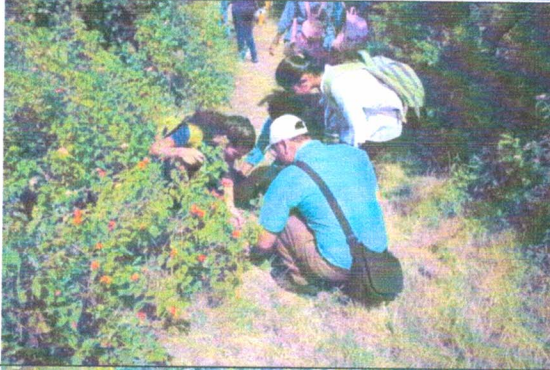
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Session 2018-19

20 students of Zoology Department (B. Sc. II & III) participated in the training “Walk with Butterfly” jointly Organized by Nisargkatta and Watsagulma Biodiversity conservation society, Washim at Katepurna Sanctuary on 14 October 2018. In this events student students learned about identification of different butterflies and their importance in nature and future prospects.

<https://www.facebook.com/milind.shirbhate/posts/1883915514997328>



Session 2018-219

Students of Zoology Department participated in the Seedball Preparation & Sowing Programme organised under Govt. of Maharashtra's 13 Crore Tree Plantation Drive organised by Divisional Forest office Wildlife Akola and Nisrgakatta Akola at Katepurna Wildlife Sanctuary on 1st July 2018

From this program students learned different Sowing Techniques in the field by hands-on experience.

<https://www.facebook.com/amol.sawant.1257/posts/1849962165024238>

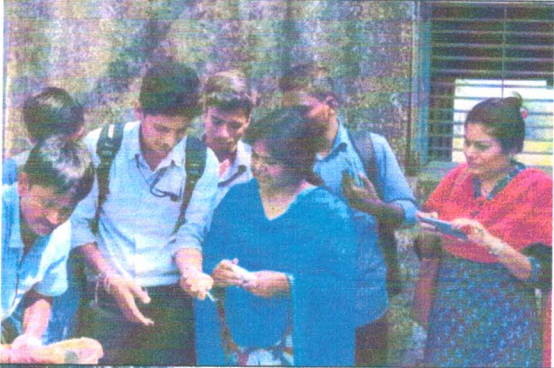
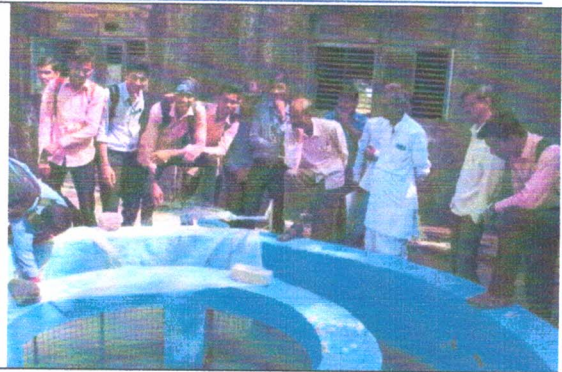
<https://www.facebook.com/milind.shirbhate/posts/1743239112398303>




Session 2018-19

Students of Zoology Department, BA and B. Com. participated in 3 days NFDB sponsored Skill development Training Program on "Reservoir Fisheries Development" organized by Department of Fisheries Government of Maharashtra, Department of Zoology Shankarlal Khandelwal college 29, 30 & 31 October 2018.

<https://www.facebook.com/skcollegeakola/photos/a.2166325667020970/2166326607020876>



Session 2018-19

Students of B. Sc. III Zoology participated to watch Flamingos in Flamingo Walk event at Ekburji Dam Dist. Washim to observe migratory Flamingos as a field experience of Ornithology on 16th December 2018

<https://www.facebook.com/milind.shirbhate/posts/1970326483022897>



लोकमत

विद्यार्थ्यांनी 'एकबुर्जी'वर केले पक्षीनिरीक्षण!

सामाजिक संघटनांचा पुढाकार अकोला, पातूर, वाशिम जिल्ह्यातील विद्यार्थ्यांचा समावेश

लोकमत वृत्त नेटवर्क

आलेख : विद्यार्थ्यांचे निर्याती आज शिक्षण यंत्रणे, त्यांचे शिक्षण यंत्रणेची पाहणी करणे, या उद्देशाने शिक्षण केंद्र आणि स्थानिक दमनगुप्त जैववैविध्य संकटन संशोधन केंद्रने १६ डिसेंबर रोजी वाशिम जिल्ह्यातील एकबुर्जी तलावावर विद्यार्थ्यांना घेऊन जाण्याचा कार्यक्रम आयोजित केला. यावेळी अकोला, पातूर आणि वाशिम जिल्ह्यातील विद्यार्थ्यांनी सहभागी होऊन पक्षीनिरीक्षण करून घेतले. यावेळी अकोला, पातूर आणि वाशिम जिल्ह्यातील विद्यार्थ्यांनी सहभागी होऊन पक्षीनिरीक्षण करून घेतले.



पक्षीनिरीक्षणसाठी एकबुर्जी तलावावर आयोजित करण्यात आलेले विद्यार्थी

पक्षी पाहण्यासाठी एकबुर्जी तलावावर आयोजित करण्यात आलेले विद्यार्थी. यावेळी अकोला, पातूर आणि वाशिम जिल्ह्यातील विद्यार्थ्यांनी सहभागी होऊन पक्षीनिरीक्षण करून घेतले.

Milo Washim
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पुण्य नगरी

विमुक्तवाणीची धेतला सहभाग : निरगंधेमी संस्थांचा उपक्रम

शालेय विद्यार्थ्यांनी केले पक्षीनिरीक्षण

शालेय विद्यार्थ्यांनी केले पक्षीनिरीक्षण. यावेळी अकोला, पातूर आणि वाशिम जिल्ह्यातील विद्यार्थ्यांनी सहभागी होऊन पक्षीनिरीक्षण करून घेतले.



शालेय विद्यार्थ्यांनी केले पक्षीनिरीक्षण

Department of Zoology
Study Tour of Class BSc. I year
Session 2016-17, 2017-18

Sr. No	Academic Year	Name of the activity	Date	Objectives of the activity
1	2016-17	Tour to MTR	06.09.16	Study of animals in their natural habit and habitat
2	2017-18	Tours to Muktagiri	16.09.17	

B.Sc.I Sem I students visited Chikhaldara, nature conservation society's "Muthawa centre" for the observation of diversity of animals in their natural habitat on 06/09/2016.



B.Sc. I students visited Muktagiri, for the observation of diversity of animals in their natural habitat on 16/09/2017.

