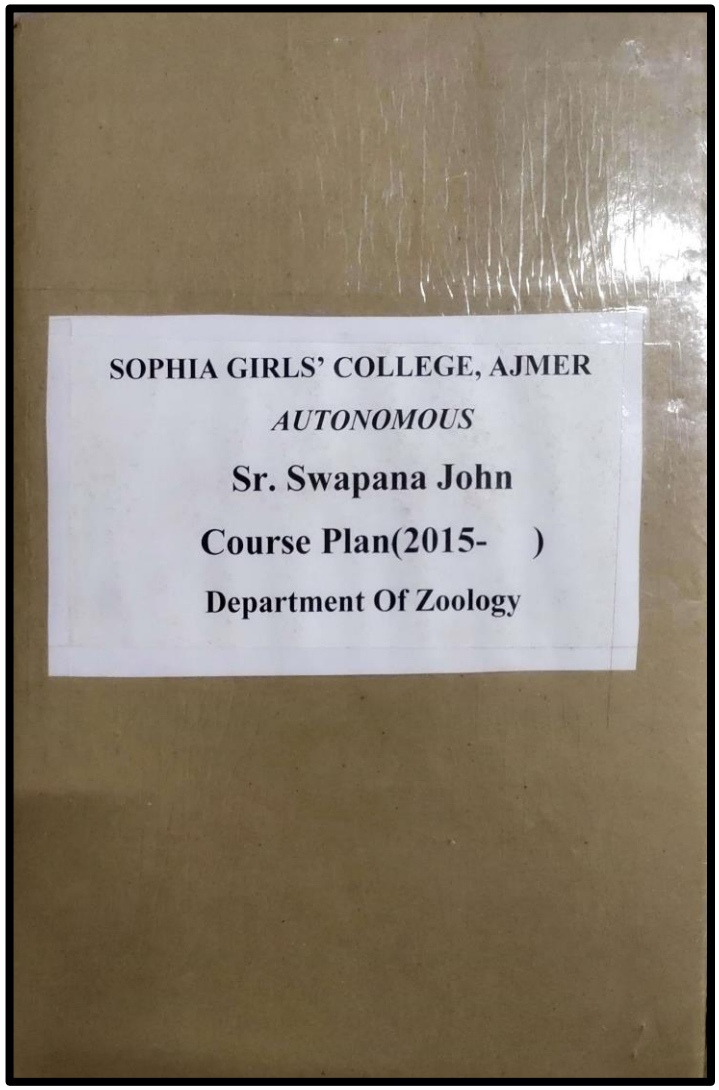
SOPHIA GIRLS' COLLEGE (AUTONOMOUS), AJMER



COURSE PLAN

U.G Programs

2020-21

SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)

B.Sc. I (SEMESTER I) Odd Sem **ZOOLOGY (PAPER I)**

(ZOO-101)

(Invertebrates: Classification and special features)

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 04

COURSE PLAN

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I August	UNIT I **Invertebrate classification**: salient features of various phyla and their classification upto Classes: Protozoa,Porifera,Colenterata,Aschelminthes,Platyhelminthes,Annelida,Arthropoda,Mollusca, Echinodermata. **General principles of taxonomy** - concept of	1.Basis of Classification.	PPT, Google Classroom, OBS, Screencastify	1.classify Invertebrate phyla demonstrating its characters upto class	*Knowledge Based* -What is Five Kingdom Classification? -Illustrate five characters of the phylum Porifera. *Understanding*	Knowledge--60 Understanding-30 Higher Order-10

	the Five Kingdom scheme.			2.Concept on Parazoa, Metazoa.	*Based* -Compare parazoa, metazoa -Classify the phylum Coelenterata and compare its classes giving example? *Higher Order Thinking Skills Based* -Justify the fact that special character follows the general character with reference to the various level of organization
	Concept of Protozoa, Parazoa, Metazoa, Eumetazoa and levels of organization.	1. concept of Parazoa, metazoa and Eumetazoa	Google meet lecture Google Quiz, Demonstration		
	Basis of classification of non-chordata: Symmetry, coelom, segmentation and embryogeny.	Levels of organization in increasing order of complexity	Video, Guest lecture on zoom, Mindmap and Infographics		
September	UNIT II **Protozoa**: Reproduction and Mode of locomotion:Cilia, Flagella and pseudopodia.	Asexual and sexual mode	OBS, Screen castify	3.Develop an idea of the special adaptation in Invertebrates	
	Porifera: Spicules: calcareous, silicious. Canal system: Ascon, Sycon and Leucon	Development of Spicules and canal system	Mind maps, Infographics Test		

	Coelenterata: Polymorphism, Corals and Coral reefs Platyhelminthes: Parasitic adaptations: Morphological and Physiological **Aschelminthes:** Life cycle with reference to Ascaris and its Economic Importance	Polymorphism and adaptations	Prezi, Canva presentation Videos		? -Critically Evaluate the concepts of Coelom giving example?	
October	UNIT III **Annelida:** Reproduction with reference to Earthworm. Locomotion:Setae and Parapodia **Arthropoda:** Metamorphosis:Ametabolous,Hemimetabolousand Holometabolous Social organization in termites and Bees :Life Cycle.Caste System and	Special features in each phylum	OBS, Google meet, Group discussion	Compare and analyze the different special features present in different phylum		

	its Economic Importance					
November-December	**Mollusca:** Foot and shells, Torsion with reference to *Pila* **Echinodermata:** Water vascular system and its function	Concept of torsion in *Pila* and locomotion in Echinoderms	PPT, Demonstration water vascular system			
February/March: Revision, Practical and End Semester Examination(Gov. Norms)						

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SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*) 2020-21

B.Sc. I (SEMESTER I) Odd Sem **ZOOLOGY (PAPER II)**

(ZOO-102)

(Structure And Function Of Invertebrates)

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 04

COURSE PLAN

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I September	1 **Skeleton:** Endoskeleton (spicules of *Sycon)*	1.Basic concept of skeleton	PPT, , Pictures question, Google Classroom	1. Describe the basic structures of the different invertebrate phyla. 2. To understand the functioning of the	*Knowledge Based* -What is Mixotrophic Nutrition ? -Illustrate the development of Spicules *Understanding Based* -Compare Endoskeleton and	Knowledge--60 Understanding -30 Higher Order-10
	2 **Food, Feeding, Digestive** structures and Digestion: Autotrophic *(Euglena),* heterotrophic- through food vacuole *(Paramecium)* and in hydroid and medusoid zooids	2. concept of nutrition and types	Demonstration, PPT, Guest lecture			

	(*Obelia*), parasitic, (*Taenia, Hirudinaria*), predatory(*Palaemon,*).			various systems	Exoskeleton - Compare the various types of nutrition	
OCTOBER	3 **Respiration:** Aquatic general body surface (*Pheretima*)	Evolution in the mode of respiration	Diagrams, Charts, Microscopic Slides			
	4 **Nervous System:** Sensory and nerve cells (*Obelia*); brain ring and longitudinal nerves (*Fasciola*)	Development of Spicules and canal system	Diagrams, Charts,Test	3. To analyze the evolution of systems from lower to higher phyla	*Higher Order Thinking Skills Based* - Justify euglena as plant and animal based on its feeding habits	
	Coelenterata: Polymorphism, Corals and Coral reefs Platyhelminthes: Parasitic adaptations: Morphological and Physiological	Polymorphism and adaptations	Diagrams, Models, Demonstration, quiz on pear deck			
NOVEMBER	Aschelminthes: Life cycle with reference to *Ascaris* and its Economic Importance	Various Asexual and Sexual mode of	Demonstration through		-Critically Evaluate the concepts of Cyclosis in Paramecium	

D IBE R	UNIT III **5.**Circulation: Cyclosis (*Paramecium),* diffusion (*Sycon, Taenia),* open circulatory system (*Palaemon),* closed circulatory system (*Nereis).* **6.**Excretion: General body surface (Paramecium), protonephridial system and flame cells (Fasciola), nephridia (Earthworm), malpighian tubules (insect), organ of Bojanus (Pila). **7.**Reproduction: Asexual (Paramecium, Sycon), alternation of generation (Obelia), sexual (Fasciola, Nereis)	reproduction	powerpoint presentation Class test, revision		-Critically evaluate the functions of Nuchal organ and statocysts - Compare and analyze the different asexual mode of reproduction present in paramecium	

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SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*) - २०२०-२१

B.Sc. III (SEMESTER V) Odd Sem
(ZOO-502)

ZOOLOGY (PAPER II)

(Biochemistry and Ethology)

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV July	1. Introduction and history of Ethology. (Karl Von Frisch, K. Lorenz, N. Tinbergen). 2. Concepts of Ethology: fixed action pattern, sign stimulus, innate releasing mechanism, motivation, imprinting and learning. 3. Methods of studying	1. Brief History into animal behaviour 2.terminologies and its concepts	PPT, Lecture on google meet, live examples, National Geographic Channel	To help students understand animal strategies and interactions and the importance	*Knowledge Based* -Explain the imprinting -Illustrate evolution of studying brain behaviour	Knowledge--60 Understanding-30 Higher Order-10

	behaviour: Neuroanatomical neurophysiological, neurochemical techniques.			of behaviour for survival	*Understanding Based* -Analyse and compare the social behaviour in monkeys and deers -Justify the action of pheromones in animals *Higher Order Thinking Skills Based* -Critically Evaluate the the breakdown of glucose in the presence and absence of oxygen	
August	4. Territory and Home range- Role of pheromones. 5. Social behaviour: Characteristics and advantages with special reference to deer and monkey.	1. concept of pheromones and communication via it	Assignments Quiz, Ppt, Google Classroom			
September	Carbohydrates **Lipids**-its structure and function	Understanding the most primitive cycle- Glycolysis Beta oxidation and its	Demonstration through powerpoint presentation, Google meet, Videos fom Havard University Google classroom,	To understand the basic integral component of biochemistry		

ber	**Proteins:** its structure and function	Basic idea on primary, secondary and tertiary protein	OBS		- Analyze the importance of citric acid with respect to ATP produced.	
November (December)	**Enzymes:** its types and factors affecting them Revision	Concept of activation energy	Videos from Harvard University Assignments			
February/March: Revision, Practical and End Semester Examination (Gov. Norms)						

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B.Sc. II (SEMESTER IV)-Even Sem (ZOO-401) **Course Plan 2020-21** **ZOOLOGY (PAPER I)**

(Animal Physiology)

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV April	**Physiology of Digestion**: nature of food stuff, various types of digestive enzymes and their digestive action in the alimentary canal.	1 various digestive enzymes and its effect on the process of digestion in mammals	Assignments, ,Google Class room, Quiz by Quizezz	1. Develop an idea of various physiological activities prevalent in animals	*Knowledge Based* -what are the various digestive enzymes found in stomach -Illustrate the role of Bile in digestion.	Knowledge--60 Understanding-30 Higher Order-10

	Physiology of Respiration: Mechanism of breathing, exchange of gases, transportation of oxygen and carbon dioxide in blood, regulation of breathing.	1. Transport of gases. 2. concept of partial pressure in gases	Group Discussion with Respect to Covid Pandemic and Respiratory health	with special reference to mammals	*Understanding Based* -Analyse the transport of CO_2 -Justify the oxygen dissociation curve
May	UNIT II **Physiology of Circulation:** Composition and function of blood, mechanism of blood clotting, heartbeat, cardiac cycle, blood pressure, body temperature regulation	1.Blood and its utility 2. Heart and its working	Presentations by students, flipped classroom, ppt, Moodle open book test	Analyze and understand the complexity of the various systems	*Higher Order Thinking Skills Based* -Justify the exchange of gases mechanism
	Physiology of Excretion: Kinds of nitrogenous excretory end-products (aminotelic, ureotelic and uricotelic), role of	1. Association of the nitrogenous waste with the habitat.	, E content, audio tutorials		

	liver in the formation excretory end products, functional architecture of mammalian kidney tubule and formation of urine, hormonal regulation of water and electrolyte balance.	2Formation of concentrated urine			-Critically Evaluate the role of cardiac cycle in pumping the blood and sustenance of life.	
June	**Physiology of Muscle Contraction**: Functional architecture of skeletal muscle, chemical and biophysical events during contraction and relaxation of muscle fibers.	Bio-physical events in muscle contraction	Projects and assignments, Insert learning,		- Compare and analyze the functions of any two endocrine glad	
July	1.Physiology of Nerve Impulse and Reflex Action: Functional architecture of a neuron	1.Transport of action potential 2.Synapse	Demonstration through PowerPoint presentation	Summarize and write about the		

				various physiologic al processes		
	2. Types of Endocrine Glands	1.Glands and its associated functions	PPT, Demonstr ation			
	3. Hormonal control of male and female reproduction and implantation	1.Male and Female hormone control	PPT, Case Studies, Revision			
August: Revision, Practical and End Semester Examination (Gov. Norms)						

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B.Sc. II (SEMESTER IV) Even Sem **ZOOLOGY (PAPER II)**
(ZOO-402)

(Genetics and Evolution)

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 04

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV April	**Mendelism**: Brief history of genetics and Mendel's work, Mendelian laws, their significance and current status, chromosomal theory of inheritance. **Chromosomal mutations**: Classifications of chromosomal mutations,	1Mendel's laws of Inheritance. 2.Mutation and its effects	PPT, Lecture method, Numericals on genetics	1. Explain Mendelism and its significance and what a mutation is and give examples of how it might occur	*Knowledge Based* -Explain the law of Independent Assortment -Illustrate evolution of moders wheat with refernce to ploidy	Knowledge--60 Understanding-30 Higher Order-10

	translocation, inversion, deletion and duplication, variation in chromosomal number - haploidy, diploidy, polyploidy, aneuoploidy,euploidy and polysomy.				*Understanding Based* -Analyse and compare Translocation and inversion -how would you Justify nonsense and missense mutation with its names	
	1. Gene Mutation: Insertion, Substitution, Frameshift, Missense and Nonsense.	1. Point Mutations	Assignments Quiz, Ppt,			
May	UNIT II **1. Linkage and crossing over.**	1.significance of crossing over 2. concept of gene interaction	Diagrams, Charts, ppt, open book test, Numericals	Deduce the significance of "crossing		

	2. **Genetic interaction:** Supplementary genes, complementary genes, duplicate genes, epistasis, inhibitory and poymorphic genes, multiple gene inheritance, ABO blood groups and Rh factor and their significance			over" and "linkage" and various genetic interactions, cytoplasmic inheritance and sex determinatio n	*Higher Order Thinking Skills Based* -Justify the ABO blood group inheritance -Critically Evaluate the the sex determination in *Drosophilla* . - Analyse the maternal gene effect with refernce to shell coiling in snail endocrine glad
	1. **Cytoplasmic inheritance.** 2. **Sex determination-** types and genic balance theory, Dosage compensation	1.Extra Chromosomal inheritance 2.role of allosomes and autosomes	Diagrams, Charts,Test		
June	1. History of evolutionary thought	1.evolution in the trends of evolutionary thoughts	Demonstrati on through powerpoint presentation	Assess	

	–Lamarckism, Neo-Lamarckism, Darwinism and Neo-Darwinism. Evidence of evolution.			various evolutionary thoughts and summarize the mechanism of natural selection, variation, isolation & adaptation		
	2.Natural selection (differential reproduction), genetic basis of evolution, speciation 3 Variations, Isolation and Adaptations and their role in evolution.	1.patterns in evolutuon	PPT, Demonstration			
July	4. **Study of extinct forms**: Dinosaurs, Archaeopteryx .Geological time scale (Basic idea).	1.basic idea on the extinct forms and time scale	PPT, Assignments			
August: Revision, Practical and End Semester Examination (Gov. Norms)						

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B.Sc. III (SEMESTER VI) **ZOOLOGY (PAPER II) (ZOO-602)**

(Ecology and Biostatistics)

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 04

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV April	1. Habitat Ecology: Concept of Habitat and Niche – Differences between Microhabitat and Macro habitat 2. Zonation and Characteristics and fauna of: a. Fresh water habitat: Lentic and Lotic systems and Ecological classification of freshwater. b. Marine water habitat: Zonation of the sea and ecological classification of marine biota	Concept of Habitat and Niche	PPT, Lecture method, Open Book Test, Group Discussion on Environment	1.Schematize the basic components of environment and their interaction. 2.Speculate the effect of environment on the distribution of animals	*Knowledge Based* -Differentiate between Habitat and Niche -Illustrate Zonation in Marine habitat	Knowledge--60 Understanding-30 Higher Order-10

	Unit II 1. Population Ecology: Interspecies and intraspecies interactions.			and effect on human. 3.Justify the importance of statistical analysis in biology	*Understanding Based* -Analyse and compare a few interspecies and Intraspecies interactions -Justify the Shelfords Law with a suitable example. *Higher Order Thinking Skills Based* -Critically Evaluate the Monoclimax and Poly Climax Theory . - Analyse the ecnomic importance of lac and sericulture	
May	2. Limiting Factors: Liebig's law of minimum and Shelfords law of tolerance 3. Characteristics of natural communities: structure, composition, stratification, succession, concept of monoclimax, diclimax, polyclimax, climatic and edaphic climaxes, periodicity, ecotonal communities, ecological indicators. 4. Ecosystem- Biotic and abiotic factors, Homeostasis, Food chain, Food web, Trophic levels, Ecological Pyramids, Energy flow and Productivity. 5. Effect of Corona Pandemic Lockdown on environment	1. concept of pheromones and communication via it	Assignments Quiz, Ppt, role plays, Google Classroom			

	Unit III 1. Mean, mode, median. Frequency distribution, graphical presentation 2. Coefficient of correlation, t-test and Chi square test 3. Standard deviation	Bio statistical tools and its basic understanding	Numericals ,Each one teach one			
July: Revision, Practical and End Semester Examination (Gov. Norms)						

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