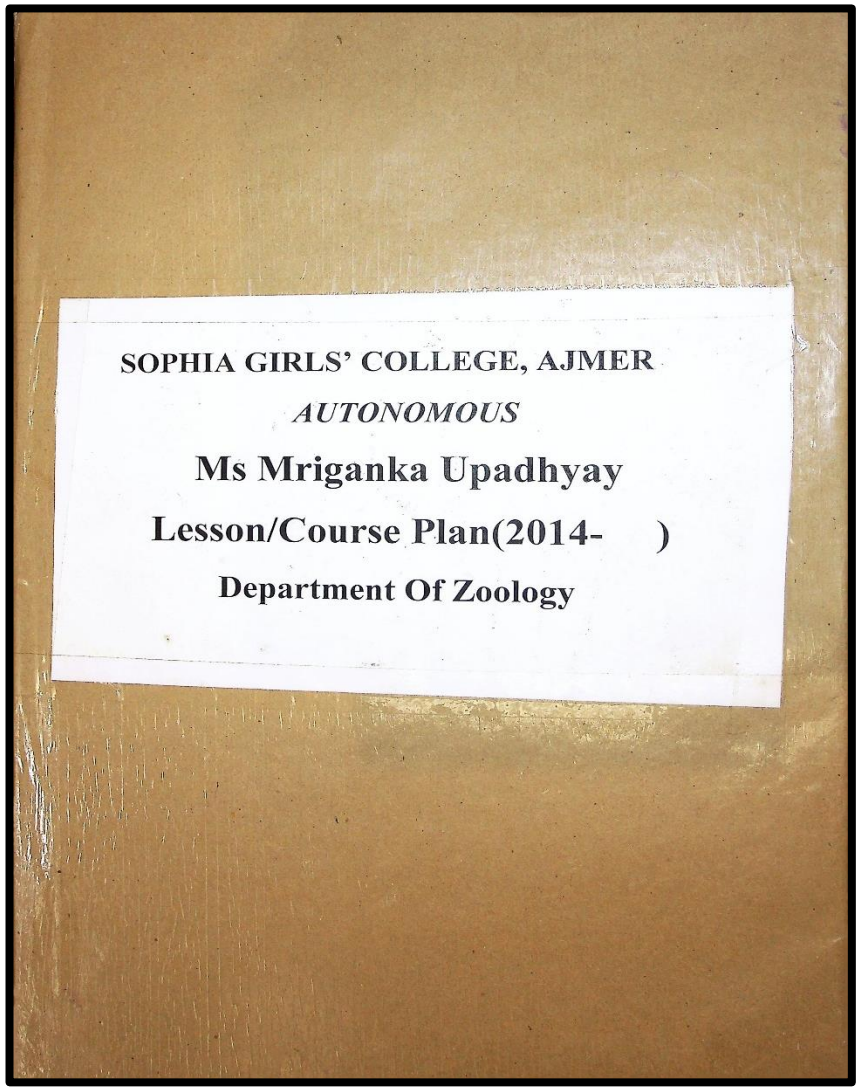
SOPHIA GIRLS' COLLEGE (AUTONOMOUS), AJMER



COURSE PLAN

B.Sc (Bio) Odd Semesters

Mriganka Upadhyay
Department Of Zoology
Session 2021-22

SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)

B.Sc. II (SEMESTER III)

Classification, Structure and Special Features of Chordates (PAPER I) (ZOO 301)

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

COURSE PLAN

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER-OCTOBER	**UNIT I** Classification and characters of phylum **chordata** (excluding extinct forms) up to classes (up to subclass in mammals).	Three basic Chordate characters and other characteristics of Chordates along with the key identifying characters of other phyla included in chordates and classification upto class . (up to subclass in mammals).	Lecture presentation ,E-content and group discussion	Describe unique characters of Fishes, Amphibians, Reptiles, Aves and Mammals, urochordates, cephalochordate and their affinities,	*Knowledge Based* - What are the basic Chordate characters -List the characters of Amphibians *Understanding Based* - Explain the Digestive system in Herdmania - Analyze the characters of	Knowledge--50 Understanding-35 Higher Order-15
	Habit, habitat, external features and anatomy of	Detailed study if the characteristics of				

	Herdmania (excluding development)	Herdmania and its various systems	Blended learning, links for audio & video lectures		Ascidian tadpole larva *Higher Order* - Justify Retrogressive Metamorhosis - Discuss the Flight adaptations in detail	
	Ascidian's tadpole larva and its Metamorphosis, Salient Features of **Hemichordata**	The significance of the Ascidian tadpole larva Familiarize with the basic features of Hemichordates	Lecture presentation and group discussion, Assignment			
NOVEMBER-DECEMBER	**UNIT II** Habit, habitat, external features and anatomy of ***Branchiostoma*** (excluding development)	Detailled study of Branchiostoma	Lecture presentation and quiz	Analyze the ecological role and special features of different groups of chordates.		

	Habit, Habitat and Salient features of ***Petromyzon*** and **Ammocoete larva**	Importance of Ammocoete larva and the salient features of Petromyzon	PPT			
	Pisces – Scales and fins, Migration, Receptor Organs (Lateral line system and Electric Organ) **Amphibia** - Parental care	Parental care as special feature in Amphibians and an insight on various types of fins and scales in Pisces and the basic receptor organs present in Fishes.	Power point Presentation and video links			
JANUARY-FEBRUARY	**UNIT III** **Reptilia** – Venomous and non-venomous snakes, Poison apparatus / venom gland	Special features of class Reptilia and to distinguish between venomous and non venomous snakes and the biting mechanism in	Lecture Presentations and Group discussions	Summarize the special features of Reptiles ,Aves and Mammals		

		detail				
	Aves - Flight adaptation, Bird migration **Mammals** - Adaptive radiation, Dentition, Echolocation in Bats	Important features of Aves and Mammalia	Audio and video lecture links and quiz			

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B.Sc. II (SEMESTER III)

Comparative Anatomy of Chordates (PAPER II) (ZOO-302)

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

COURSE PLAN

SEM III Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER-OCTOBER	UNIT I Comparative study of **Pisces, Amphibians, Reptiles, Aves and Mammals.** Integument including structure and development of placoid scales, feathers and hair	Comparative account of the Integumentary system and its derivatives in Amphibians Rreptiles,Aves and Mammals	Lecture cum demonstration, models and brainstorming	Identify and provide a basic description of how major vertebrate systems function.		Knowledge--50 Understanding-35 Higher Order-15
	Alimentary canal	Comparative digestive system of the major	Lecture Presentation and		*Knowledge Based*	

		vertebrate phyla and its correlation with diet	group discussion		-What is Integument -Recall and Explain any 4 integumentary derivatives *Understanding Based* -Compare the Pelvic Girdles in various phyla -analyze the plan of respiratory system in Aves *Higher Order Thinking Skills Based*	
NOVEMBER-DECEMBER	UNIT II Basic plan of vertebrate endoskeleton.	Comparative account of the endoskeleton found in the major vertebrate phyla	Demonstration and Lecture Presentation	Correlate morphology to its function, especially with respect to the adaptive significance of particular structures and organ systems.		
	Heart and aortic arches	Understand the evolution of heart and aortic arches in various phyla	Lecture Presentation and video links			
	Respiratory system	Examine the differences in respiratory mechanisms accordin to the environment	PPT Lecture and links of E-content			
JANUARY-FEBRUARY	Excretory system ,	Understand the evolution and differences in the	Guest Lecture, Lecture Presentation and	Compare and discriminate the anatomical		

		urinogenital System in various phyla	Group Discussion	systems of different vertebrates and identify common traits across species and/or groups.	-Assess the evolution of Brain in various phyla -Appraise the Structure of Aortic Arches in chordate phyla	
	Reproductive system	Understand the evolution and differences in the urinogenital System in various phyla				
	Brain	Understand the changes which took place in the structure of brain and how it gradually evolved in mammals	Lecture Presentation and Quiz			

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B.Sc. III (SEMESTER V)

Molecular Biology (PAPER I) (ZOO 501)

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

COURSE PLAN

SEM V Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER-OCTOBER	UNIT I **DNA** Structure, polymorphism (**A, B and Z type**)	Basic Structure of DNA and its polymorphic forms ie its types	Lecture Presentation, video links of animations of structure and replication , and quiz	Review how DNA encodes genetic information ,its polymorphic forms and the role of various enzymes related to stability and replication of DNA .	*Knowledge Based* - Recall the structure of B-DNA in detail *Understanding Based* - Explain the mechanism of Replication in	Knowledge--40
	Replication in Eukaryotes (semi-conservative mechanism), elementary idea about polymerases, topoisomerases, single strand binding protein, replication forks(Both unidirectional and bidirectional), leading and lagging strands, RNA primers and Okazaki fragments.	Process of Replication in detail with the major enzymes involved during the entire process				

					detail Analyze the process of Replication in detail *Higher Order* - Discuss the Process of Transcription in detail .Illustrate your answer with suitable diagrams	Understanding-35 Higher Order-25
NOVEMBER-DECEMBER	**Unit – II.** **RNA** structure and types **(mRNA, rRNA and tRNA)**	To understand the basic structure of RNA and its types and their functions	Presentation, Video animations, pdf notes ,link of material, group discussions	To Explain the mechanisms associated with Gene expression at the level of Transcription and Translation		
	Genetic Code: Triplet Codon, Code Characteristics-Degeneracy and Wobble Hypothesis	To understand the				

	Transcription: Prokaryotic and Eukaryotic mechanism of transcription (elementary idea about polymerases, capping, poly A tail, exon and introns).	properties of Genetic code in detail and the mechanism of Transcription in detail				
JANUARY-FEBRUARY	**UNIT III** **Translation**: (excluding Post Translational Modification)	To understand the process of Translation in detail	Presentation ,video lectures,quiz and links of text material from epg pathshala	Summarize and explain the events involved in DNA repair mechanisms		
	DNA Repair Mechanisms: Pyrimidine dimerization and mismatch repair	Understand the DNA errors and the repair mechanisms involved				

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B.Sc. III (SEMESTER V)

Microbiology (PAPER I) (ZOO 502B)

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

COURSE PLAN

SEM V Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER OCTOBER	UNIT I **The Prokaryota (Bacteria)Structural organization :** Size, shapes and patterns Structural organization Slime layer (capsule), cell envelopes cytoplasmic membrane (inner membrane) cell wall (outer membrane) of Gram negative and Gram positive bacteria, mesosomes, cytoplasmic organization cell projections,	Basic Structure of Bacteria, Gram positive and Gram negative bacteria	Lecture Presentation, video links of animations of and quiz	To familiarize the students with the basic Structural and genetic organization of bacteria and its modes of reproduction .	*Knowledge Based* - Recall the structural organisation of Bacteria *Understanding Based* - Explain the mechanism of	

	flagella and pili.				Replication in detail Analyze the various modes of reproduction in Bacteria *Higher Order* - Discuss the Process of Beer Production in detail .Illustrate your answer with flow chart	Knowledge--40 Understanding-35 Higher Order-25
	Genetic material of bacteria. Chromosome Plasmids replication of bacterial DNA Reproduction in Bacteria , asexual reproduction: binary fission, budding, endospore formation, exospore and cyst formation, sexual reproduction: conjugation.	Genetic material in Bacteria and modes of reproduction				

NOVEMBER-DECEMBER	Unit – II. **Bacteria of medical importance: Brief introduction** a. Tetanus b. Diarrhoea c. Tuberculosis d. Streptococcal pharyngitis e. Gonorrhoea f. Botulism	To understand the bacteria of medical importance .diseases caused by them and their prevention	Presentation, Video animations, pdf notes ,link of material, group discussions	To have an idea of few disease causing bacteria, their transmission and treatment To know about the causative agents of AIDS,its transmission,treatment and prevention		
	AIDS					

	a The causative agents b Transmission, treatment and prevention					
JANUARY-FEBRUARY	**UNIT III** **Food and dairy microbiology** (outline idea only Food microbiology: micro-organisms and their importance in food microbiology-moulds, yeast, bacteria, general features and classification, principles of food preservation, classification on various groups of microorganisms associated with industry, acid fermented milk	To understand the process involved in Dairy products and Alcohol industry	Presentation ,video lectures,quiz, visit to bakery or a distillery unit	To understand the importance of bacteria in food and dairy industry		

	(yoghurt,cultured buttermilk), starter cultures for fermented dairy products(Streptococcus thermophilus, lactobacillus bulgaricus), cheese production :steps involved in manufacture of cheese, preservation, classification and nutritional aspects.					
	Alcohol Production (outline idea only) : Production of Beer - malting process, mashing process and finishing , production of wine:microbial process , wine from grapes, fermentation and recovery, types of white wine and red wine, production of distilled beverage or liquor rum. Products.	Understand the process of production of Beer, wine and rum				

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