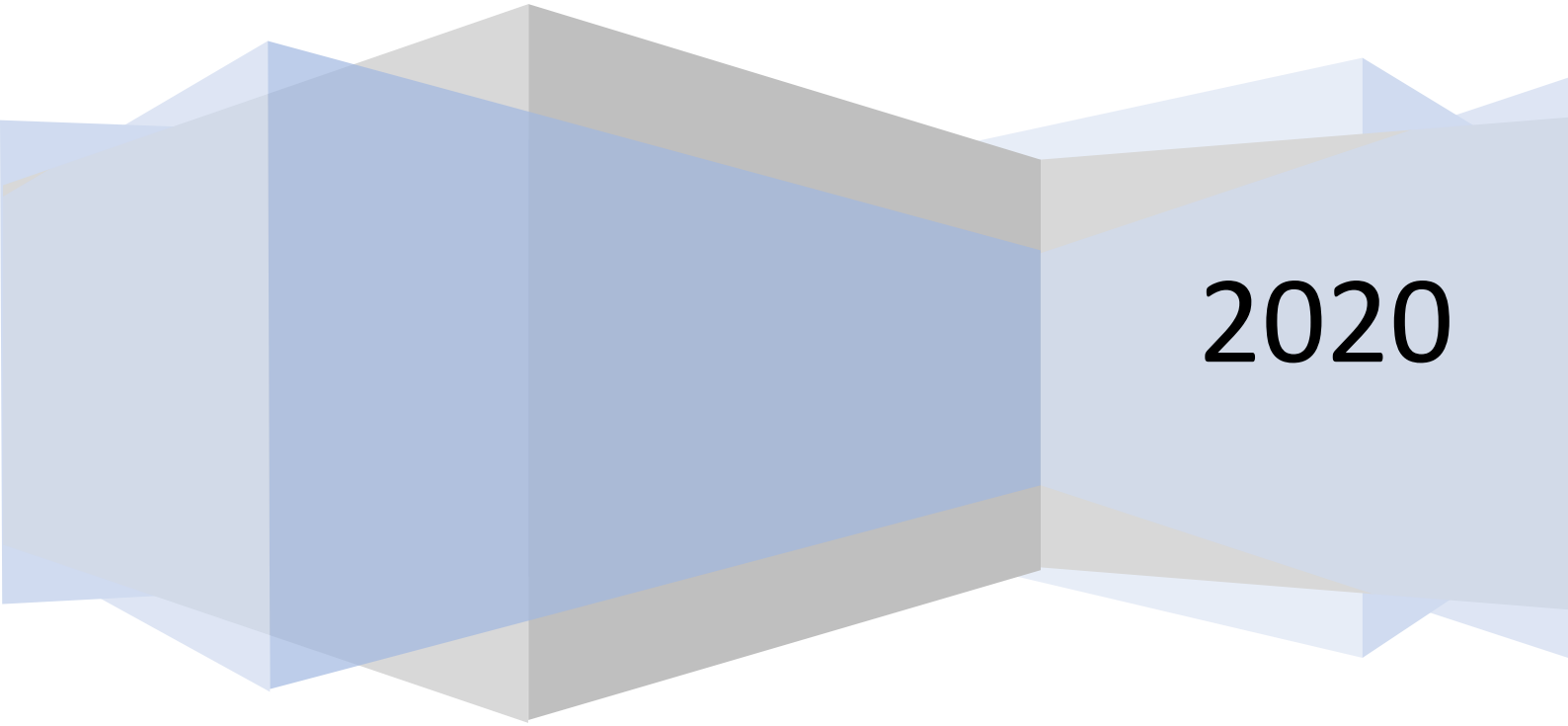
Department of Zoology, Basirhat College

Lesson Plan – Zoology
Honours Courses

Semester- III & V

Session- July – Dec, 2020



CONTENTS

Semester - III

Lesson Plan for Course: Chordates Code: ZOOACOR05T Credit: 4

Course coordinator: **Chinmoy Ghosh**

Course Outcome
Upon completion of the course, the students will be able to:
CO1. Comprehend the the characteristics in different classes of chordates.

CO2. Recognize an animal as an individual of specific group or subgroup of chordates from its characteristics and distinguishing features.
CO3. Appreciate the course of evolution from the similarities and differences in lifeform and functions among various groups ofanimals in Phylum Chordata.
CO4. Elucidate specific way of living in different classes of chordates.
CO5. Understand the distribution of chordates in different continents and can explain the possible reason of it.

Course planner

Online Platform Used: Google Classroom

Google Classroom joining code: *33iyetn*

Month	Weeks	Course Topic	Teacher	Class-hour	Remarks*
Jul	wk1	Class suspended for Pandemic		0	
	wk2	Class suspended for Pandemic		0	
	wk3	Class suspended for Pandemic		0	
	wk4	Class suspended for Pandemic		0	
Aug	wk5	**Unit 1: Introduction to Chordates** General characteristics and outline classification of Phylum Chordata	CG	2	Online class, slide presentation
	wk6	**Unit 2: Protochordata** General characteristics and classification of sub-phylum Urochordata and Cephalochordata up to Classes. Metamorphosis in Ascidia	CG	3	Online class, slide presentation
	wk7	Chordate Features and Feeding in Branchiostoma	CG	3	Online class, slide presentation
	wk8	**Unit 3: Origin of Chordata** Dipleurula concept and the Echinoderm theory of origin of chordates. Advanced features of vertebrates	CG	3	Online class, slide presentation, Assignments

For CBCS courses

		overProtochordata.			
	wk9	**Unit 4: Agnatha** General characteristics and classification of cyclostomes up to order	CG	2	Online class, slide presentation, Video presentaion
	Wk9	**Assesment test**		1	Online quiz
Month	**Wk**	**Course Topic**	**Teacher**	**Class Hour**	**Remarks***
Sep	wk10	**Unit 5: Pisces** General characteristics and classification of Chondrichthyes and Osteichthyes up to Subclasses.	CG	3	Online class, slide presentation
	wk11	Migration and parental care in fishes	CG	3	Online class, slide presentation
	wk12	Accessory respiratory organ, Swim bladder in fishes.	CG	2	Online class, slide presentation
	wk13	**Unit 6: Amphibia** General characteristics and classification up to living Orders.Metamorphosis in amphibia.	CG	3	Online class, slide presentation
Oct	wk14	Parental care in Amphibia	CG	2	Online class, slide presentation
	wk15	**Unit 7: Reptilia** General characteristics and classification up to living Orders Poison apparatus and Biting mechanism in Snake	CG	3	Online class, slide presentation, video presentation
	wk16	**Unit 8: Aves** General characteristics and classification up to Sub-Classes. Exoskeleton in birds.	CG	2	Peer study, Group discussion
	wk17	**Mid term examination**		0	Online Assignment
Nov	wk18	**Puja Vacation**		0	
	wk19	**Puja Vacation**		0	
	wk20	**Puja Vacation**		0	
	wk21	migration in Birds	CG	1	Online class
	wk22	Principles and aerodynamics of flight	CG	1	Online class
Dec	wk23	**Unit 9: Mammals** General characters and classification up to living orders. Phylogenetic significance of Prototheria	CG	2	Online class, slide presentation
	wk24	Exoskeleton derivatives of mammals Adaptive radiation in mammals with reference to locomotory appendages. Echolocation in Microchiropterans and Cetaceans	CG	3	Online class, slide presentation
	wk25	**Unit 10: Zoogeography** Zoogeographical realms, Plate tectonic and Continental drift theory,Distribution of birds and mammals in different realms	CG	3	Online class, slide presentation
	wk26	**End term exam**		0	

For CBCS courses

	wk27	Winter recess		0	
		Total Class Hour		42	

Resources :

Recommended Online resources:

- Online Study material given in Google Classroom
- Referred You tube videos as advised in Google classroom

Text Book:

- Kardong, K. V. (2002). Vertebrates: Comparative anatomy, function evolution. McGraw Hill 4th Ed.2005.
- Young, J. Z. (2004). The Life of Vertebrates. III Edition. Oxford university press.
- Pough H. Vertebrate life, VIII Edition, Pearson International.

References:

- Students are encouraged to explore authentic websites (for e.g. wikipedia, different universitywebsites and OCWs) at internet for reading / audio-visual materials on a particular topic if they don'tfind enough in the text books or otherwise)
- Comparative Anatomy of the Vertebrates 9th Ed (2015) by Kent; McGrew-Hill
- Elements of Chordate Anatomy by Weichert and Presch, 2017, Amazon.in
- Biology of Animals; Sinha, Ganguli, Adhikari

Lesson Plan for Course: Physiology, Code: ZOOACORT06T, Credit- 4 credits

Course coordinator:...RAJASHREE MALLICK

Course Outcome

- ✓ CO1:Understand the cell, tissue, organ, system and organisms.
- ✓ CO2:Understanding of the nerve impulses conducted at myelinated and nonmyelinated nervefibre
- ✓ CO3: To gain the knowledge of the different endocrine glands, its structure and function

Course planner

Date	**Course Topic**	**Teacher**	**Class-hour**	**Remarks***
Jul 28th	Unit 1: Tissues Structure,	Rajashree Mallick	**6** classes	Online using google meet
29th	locations,	Rajashree Mallick		Online using google meet

For CBCS courses

30th	EXAM	Rajashree Mallick		Online using google meet
Aug				
4th	Epithelial and connective tissues	Rajashree Mallick		Online using google meet
5th	Muscle tissue	Rajashree Mallick		Online using google meet
6TH	Exam repeat	Rajashree Mallick		Online using google meet
12th	**UNIT 2**: Bone	Rajashree Mallick	**5**	Online using google meet
13th	Havarsian system	Rajashree Mallick		Online using google meet
18th	Havarsian	Rajashree Mallick		Online using google meet
19th	Bone devlopment	Rajashree Mallick		Online using google meet
20th	Class test	Rajashree Mallick		Online using google meet
21th	**Unit 3** : Neuron structure	Rajashree Mallick	**10**	Online using google meet
26th	Class exam	Rajashree Mallick		Online short test using google classroom
27th	practical	Rajashree Mallick		Online demonstration using google meet
Sep				
3rd	Action potencial	Rajashree Mallick		Online using google meet
8th	Action potencial	Rajashree Mallick		Online using google meet
9th	Synaps	Rajashree Mallick		Online using google meet
10th	practical	Rajashree Mallick		Online using google meet
15th	Neurotransmission	Rajashree Mallick		Online using google meet
16th	Reflex	Rajashree Mallick		Online using google meet
22th	Reflex	Rajashree Mallick		Online using google meet
23th	**UNIT 4: Muscle structure**	Rajashree Mallick	**8**	Online using google meet
24th	Types of muscle	Rajashree Mallick		Online using google meet
29th	Ultra structure of skeletal muscle	Rajashree Mallick		Online using google meet
30th	Ultra structure of skeletal muscle	Rajashree Mallick		Online using google meet

For CBCS courses

Oct	**Assessment: Mid-term Test**			
1st	Molecular and chemical basis of muscle contraction	Rajashree Mallick		Online using google meet
5th	Molecular and chemical basis of muscle contraction	Rajashree Mallick		Online using google meet
6th	Characteristics of muscle fiber	Rajashree Mallick		Online using google meet
7th	Class exam	Rajashree Mallick		Online quiz using google classroom form
13th	Unit 5: Reproductive System	Rajashree Mallick	**4**	Online using google meet
14th	Histology of testis	Rajashree Mallick		Online using google meet
15th	Histology of overy	Rajashree Mallick		Online using google meet
20th	Physiology of Reproduction	Rajashree Mallick		Online using google meet
Nov	Unit 6: Endocrine System	Rajashree Mallick	**10**	Online using google meet
18th	Histology of pituitary,	Rajashree Mallick		Online using google meet
19th	Function of pituitary	Rajashree Mallick		Online using google meet
24th	holiday	Rajashree Mallick		Online using google meet
25th	Histology and function of thyroid,	Rajashree Mallick		Online using google meet
26th	Histology and function of pancreas and adrenal	Rajashree Mallick		Online using google meet
Dec				
1st	Classification of hormones	Rajashree Mallick		Online using google meet
2nd	Mechanism of Hormone action	Rajashree Mallick		Online using google meet
3rd	Signal transduction pathways for Steroidal and Non steroidal hormones;	Rajashree Mallick		Online using google meet
8th	Hypothalamus (neuroendocrine	Rajashree Mallick		Online using google meet

For CBCS courses

	gland) - principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system			
9th	Placental hormones	Rajashree Mallick		Online using google meet
10th	Class test			Online quiz using google classroom
	Assessment: End-term Test		Total: **43**Hrs	

Resources :

1. Books:Ganong's Review of Medical Physiology by Barret; 25th Ed, McGrew-Hill, 2016
2. Ross MH, Pawlina W. 2010. Histology: A Text and Atlas. Sixth Edition. Lippincott Williams &Wilkins
3. Other resources :Internet
4. WIKIPEDIA
5. Youtubevedio
6. Doc material notes

Lesson Plan for Course: Biochemistry, Code: ZOOACOR07T, Credit: 4

Course coordinator:..UDAY HOSSAIN

Course Outcome

- ✓ CO1: To understand the link between biological processes and chemistry behind that.
- ✓ CO2:Gather knowledge about metabolism and synthesis of various essential biomolecules.

Course planner

Sl	Course Topic	Teacher	Class-hour	Remarks*
Jul	**Unit 1:Fundamentals of biochemical reactions and metabolism**	UdayHossain		
	Ionization of water, weak acids and bases		1	Theoretical, PPT presentation
Aug	**Unit 1:Fundamentals of biochemical reactions and metabolism**	UdayHossain		
	Buffering and pH changes in living systems,		1	Theoretical, PPT presentation
	Metabolism: Catabolism and Anabolism, Compartmentalization of metabolic pathways.		1	Theoretical, PPT presentation, animation from YouTube
	Shuttle systems and membrane transporters;		1	Theoretical, PPT presentation, animation from

				YouTube, notes in Google classroom
	ATP as "Energy Currency of cell";coupled reactions; Use of reducing equivalents and cofactors; Intermediary metabolism and regulatory mechanisms		1	Theoretical, PPT presentation, notes in Google classroom
	Class test		1	MCQ in Google classroom
	Unit 2: Carbohydrates	UdayHossain		
	Structure and Biological importance: Monosaccharides		1	Theoretical, PPT presentation, notes in Google classroom
	Disaccharides, Polysaccharides, Derivatives of Monosachharides		1	Theoretical, PPT presentation, notes in Google classroom
	Glycolysis		1	Theoretical, PPT presentation, notes in Google classroom
	Citric acid cycle		1	Theoretical, PPT presentation, notes in Google classroom, YouTube video
	Pentose phosphate pathway, Gluconeogenesis		1	Theoretical, PPT presentation, notes in Google classroom
	Class Test		1	In Google classroom
Sep	**Unit 3: Lipids**	UdayHossain		
	Physiologically important saturated and unsaturated fatty acids		1	Theoretical, PPT presentation, notes in Google classroom
	Triacylglycerols, Phospholipids		1	Theoretical, PPT presentation, notes in Google classroom
	Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpinoids		1	Theoretical, PPT presentation, notes in Google classroom
	β-oxidation of fatty acids		1	Theoretical, PPT presentation, notes in Google classroom, YouTube video
	Fatty acid biosynthesis		1	Theoretical, PPT presentation,

				notes in Google classroom
	Class test		1	Quiz on Google classroom
	Unit 4: Proteins	UdayHossain		
	Amino acids Structure, Classification of amino acids		1	Theoretical, PPT presentation, notes in Google classroom
	General and Electro chemical properties of α-amino acids; Physiological importance of essential and non-essential amino acids		1	Theoretical, PPT presentation, notes in Google classroom
	Proteins Bonds stabilizing protein structure; Levels of organization		1	Theoretical, PPT presentation, notes in Google classroom
Oct	**Unit 4: Proteins**	UdayHossain		
	Transamination, Deamination		1	Theoretical, PPT presentation, notes in Google classroom
	Urea cycle, Fate of C-skeleton of Glucogenic and Ketogenic amino acids		1	Theoretical, PPT presentation, notes in Google classroom
	Class test		1	Quiz in Google classroom
	Unit 5: Nucleic Acids	UdayHossain		
	Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids		1	Theoretical, PPT presentation, notes in Google classroom
	Types of DNA and RNA		1	Theoretical, PPT presentation, notes in Google classroom
	Complementarity of DNA, Hypo-Hyperchromaticity of DNA		1	Theoretical, PPT presentation, notes in Google classroom
	Outlines of nucleotide metabolism		1	Theoretical, PPT presentation, notes in Google classroom
	Class Test		1	Quiz in Google classroom
	Assessment: Mid-term Test			
Nov	**Unit 6: Enzymes**	UdayHossain		

	Nomenclature and classification of enzymes		1	Theoretical, PPT presentation, notes in Google classroom
	Cofactors; Specificity of enzyme action, Isozymes, Mechanism of enzyme action		1	Theoretical, PPT presentation, notes in Google classroom
	Enzyme kinetics; Derivation of Michaelis-Menten equation		1	Theoretical, PPT presentation, notes in Google classroom, Youtube animation
Dec	**Unit 6: Enzymes**	UdayHossain		
	Lineweaver-Burk plot; Factors affecting rate of enzyme-catalyzedreactions		1	Theoretical, PPT presentation, notes in Google classroom
	Enzyme inhibition; Allosteric enzymes and their kinetics		1	Theoretical, PPT presentation, notes in Google classroom
	Strategy of enzyme action- Catalytic and Regulatory (Basic concept with one example each)		1	Theoretical, PPT presentation, notes in Google classroom
	Class test		1	Quiz in Google classroom
	Unit 7: Oxidative Phosphorylation	UdayHossain		
	Redox systems		1	Theoretical, PPT presentation, notes in Google classroom
	Review of mitochondrial respiratory chain		1	Theoretical, PPT presentation, notes in Google classroom, Youtube animation
	Inhibitors and un-couplers of Electron Transport System		1	Theoretical, PPT presentation, notes in Google classroom
	Class Test		1	Quiz
	Assessment: End-term Test		Total: 40 Hrs	

Resources :

7. Books: Principal of Biochemistry 6th edition(Lehninger), Biochemisrty 4th edition(Voet and Voet)

8. Other resources :Youtube animation links, Wikipedia, some ebooks

*Remarks will specify

- The nature of the class-topic (viz. Theoretical, Practical, and Tutorial).
- Methodology of teaching (whether using ICT, engaging students in group discussion, quiz etc. etc.)
- Different modes of assessment. (Please check UGC evaluation reforms).

Semester- V

Lesson Plan for Course: Molecular Biology , Code: ZOOACOR11T, Credit: 4

Course coordinator: **Chinmoy Ghosh**

Course Outcome

After successful completion of the course students can:

1. *Describe and explain* the basic mechanism of core molecular biological process of information transfer in a cell i.e. replication, transcription and translation.
2. *Compare* the process of replication, transcription and translation in prokaryotic and eukaryotic system.
3. Elucidate post transcriptional processing and modification of RNAs which includes capping, polyadenilation, splicing and editing.
4. Recognize the roll of RNA and other proteins in prokaryotic regulation of gene expression.
5. Describe different repair mechanism of DNA and can link it to the other cellular process
6. Understand the underlying principle of molecular biological techniques for amplifying, identifying and sequencing nucleic acids.
7. Apply the knowledge to decode genetic sequence to corresponding amino acid sequence
8. Appreciate the underlying uniformity of molecular biological system throughout animal world.

Course planner

Online Platform Used: Google Classroom

Google Classroom joining code: *5jkwgr4*

Month	Weeks	Course Topic	Teacher	Class-hour	Remarks*
Jul	wk1	Class suspended for Pandemic		0	
	wk2	Class suspended for Pandemic		0	
	wk3	Class suspended for Pandemic		0	
	wk4	Class suspended for Pandemic		0	
Aug	wk5	Salient features of DNA and RNA Watson and Crick Model of DNA	CG	2	Online class, slide presentation
	wk6	DNA replication: Semi-conservative, bidirectional and discontinuousReplication	CG	3	Online class, slide presentation
	wk7	Mechanism of DNA Replication in Prokaryotes, RNA priming, Replication of telomeres	CG	3	Online class, slide presentation
	wk8	Mechanism of Transcription in prokaryotes: Initiation, elongation, termination. Mechanism of Transcription in eukaryotes.	CG	3	Online class, slide presentation, Assignments
	wk9	Mechanism of Transcription in eukaryotes… contd. Transcription factors, Difference betweenprokaryotic and eukaryotic transcription.	CG	2	Online class, slide presentation, Video presentaion

For CBCS courses

Month	Wk	Course Topic	Teacher	Class-hour	Remarks*
	Wk9	**Assesment test**		1	Self-grading online quiz
Sep	wk10	Genetic code, Degeneracy of the genetic code and WobbleHypothesis;Ribosome structure and assembly in prokaryotes, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation of translation.	CG	3	Online class, slide presentation
	wk11	Elongation and termination of polypeptide chain; fidelity ofprotein synthesis, Difference between prokaryotic and eukaryotic translation, Inhibitors of protein synthesis;	CG	3	Online class, slide presentation
	wk12	Capping and Poly A tail formation in mRNA; Split genes: concept of introns and exons, splicingmechanism,	CG	2	Online class, slide presentation
	wk13	Alternative splicing, exon shuffling, and RNA editing, Processing of tRNA	CG	3	Online class, slide presentation
Oct	wk14	Regulation of Transcription in prokaryotes: lac operon and trp operon;	CG	2	Online class, slide presentation
	wk15	Regulation of Transcription in eukaryotes: Activators, enhancers, silencer, repressors, miRNA mediated gene silencing, Genetic imprinting	CG	3	Online class, slide presentation, video presentation
	wk16	Doubt Clearing class.	CG	2	Peer study, Group discussion
	wk17	**Mid term examination**		0	Online Assignment
Nov	wk18	**Puja Vacation**		0	
	wk19	**Puja Vacation**		0	
	wk20	**Puja Vacation**		0	
	wk21	Recapitulation of previous topics. Types of DNA repair mechanisms,	CG	1	Online class, slide presentation
	wk22	RecBCD model in prokaryotes,	CG	1	Online class, slide presentation
Dec	wk23	Nucleotide and base excision repair, SOS repair	CG	2	Online class, slide presentation
	wk24	PCR, Western and Southern blot, Northern Blot,	CG	3	Online class, slide presentation
	wk25	Sanger DNA sequencing , cDNA technology	CG	3	Online class, slide presentation
	wk26	**End term exam**		0	
	wk27	Winter recess		0	
		Total Class Hour		42	

Resources :

Recommended Online resources:

- Online Study material given in Google Classroom
- Referred You tube videos as advised in Google classroom
- e-pgPathsala: https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2

For CBCS courses

- iBiology online resources: https://www.ibiology.org/research-talks/genetics-and-gene-regulation/
- **Text Book:**

9. 1. Campbell's Biology, 11th Edition by Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V.
10. Minorsky, Jane B. Reece , Published by Pearson Copyright © 2017.
11. Molecular Biology of The Gene by Watson. 7th Edition. Pearson.

- **Reference Books:**

12. Molecular Cell Biology by Harvey Lodish. 7th Edition. W.H. Freeman.
13. **iGenetics: A Molecular Approach by Peter. J. Russell.** 3rd edition. Pearson Benjamin Cummings.
14. Principles and Techniques of Biochemistry and Molecular Biology by Keith Wilson and John
15. Walker, Cambridge Univ. Press, Paperback

Lesson Plan for Course: GENETICS, Code- ZOOACOR12T, Credit- 04

Course coordinator: Arpita Mondal

Course Outcome

- ✓ CO1:To understand the gene, allele, chromosomes composition in living organism and their genetical analysis.
- ✓ CO2:To analyse the mathamatical problems of genetics and gene distance of chromosomes.
- ✓ CO3: To learn the information about the human disease and their genetical aspects.
- ✓ CO4: To understand the mutagens and their effect and the important element of living organism.

Course planner

Sl	Course Topic	Teacher	Class-hour	Remarks*
Jul	Unit-1: MENDELIAN GENETICS and its EXTENSION 1. Background of Mendel's Experiments.	AM	01	Online Lecture Method, PPT Presentation.
	2. Principles of Mendelian Inheritance.	AM	01	Online Lecture Method, PPT Presentation. You Tube animation.https://youtu.be/ADnlPrFJccA
Aug	Unit-1:	AM	01	Online Lecture Method, PPT presentation, You Tube Animation.https://youtu.be/BAodvx5wOfU

For CBCS courses

	3. Incomplete Dominance and Codominance, Multiple alleles.			
	4. Epistasis, Lethal alleles, Pleiotropy.	AM	02	Online Lecture Method, PPT presentation. You Tube animation https://youtu.be/EP8ZytVnU3Q .
	5. Sex- linked, Sex-influenced and Sex-limited inheritance, Polygenic inheritance.	AM	01	Online Lecture Method, PPT presentation, A question answer section willbe held on 21st Aug on Unit1 in Meet.
	Unit-2:LINKAGE CROSSING OVER and CHROMOSOMAL MAPPING: 1. Linkage and Crossing over.	AM	01	Online Lecture Method, PPT Presentation.
	2. Molecular basis of Crossing Over.	AM	01	Online Lecture Method, PPT presentation, You Tube Animation.https://youtu.be/Y9vDb0QoD9o
	3. Measuring Recombination frequency and Linkage intensity using three factor Crosses.	AM	02	Online Lecture Method, PPT Presentation. Problem solution.
	4. Interference and Codominance.	AM	01	Online Lecture Method, PPT Presentation. Math Problem solution in video conference by meet app.
Sep	Unit-3: MUTATION 1. Types of Gene Mutation (Classification), Types of Chromosomal aberrations (Classification with one suitable example of each). Chromosomal aberration.	AM	02	Study through e-book (pdf format). PPT presentation. Lecture Method.
		AM	01	A question answer section will be held in Meet app.

	2. Gene Mutation and Human diseases (Down's, Klienfelter's, Cri du chat, Sickle cell, Haemophilia, Thallassimia, Albinism – only genetical aspects here, details of physiological consequences not required).	AM	02	Lecture Method. PPT presentation. You Tube Animation.https://youtu.be/LOX_59RSF68
		AM	01	A question answer section will be held in meet app on Human disease.
	3. Sex chromosomes and Sex-linked inheritance.	AM	01	Lecture method. PPT presentation.
4.	Non- disjunction and Variation in chromosome number; Molecular basis of mutations in relation to UV light and chemical mutagens.	AM	02	Lecture Method. PPT presentation You Tube Animation. https://youtu.be/EA0qxhR2oOk .
	EXAM ON UNIT-3	AM	01	. An Exam was held in 29th Sep on Unit2 in Google Classroom.
Oct	Unit- 4: SEX DETERMINATION 1. Mechanisms of sex determination and Drosophila with reference to alternative splicing.	AM	01	Lecture Method. PPT presentation. You Tube Animation. https://youtu.be/uBzz9s0_ixc
	2. Sex determination in Mammals	AM	01	Lecture Method. PPT presentation. You Tube Animation.https://youtu.be/uBzz9s0_ixc
	3. Dosage compensation in Drosophila and Human. EXAM ON UNIT-4	AM AM	01 01	Lecture Method. PPT Presentation. Study through e-book. An Exam was held in 10thOct in Google Classroom on Unit-4.
	Unit-5: EXTRA-CHROMOSOMAL INHERITANCE	AM	01	Lecture Method. PPT Presentation.

	1. Criteria for extra chromosomal inheritance.			
	2. Antibiotic resistance in Chlamydomonas, Kappa particle in Paramoecium Shell spiraling in snail.	AM	02	Study through e-book.Online Lecture Method. PPT presentation.
ASSESSMENT: Mid Semester Exam				
	OCT 22nd to 17th Nov Puja Vacation			
Nov	Unit-6: Recombination in Bacteria and Viruses 1. Conjugation, Transformation, Transduction.	AM	03	Lecture Method. PPT presentation. You Tube Animation.https://youtu.be/iJGY1boNOdg
	EXAM ON RECOMBINATION	AM	01	An Exam was held in GC on 28th Nov.
Dec	2. Complementation test in Bacteriophage		02	Lecture Method. PPT presentation. You Tube Animation.https://youtu.be/_aVUuMi3i_I
				A question answer section will be held on UNIT-6
	Unit-7: TRANSPOSABLE GENETIC ELEMENT 1. Transposons in Bacteria.		02	Lecture Method. PPT presentation. Study through e-book.
	2. Ac-Ds elements in Maize and P elements in Drosophila.		02	Lecture Method. PPT presentation. A question answer section will be held in MEET app.
	3. LINE, SINE, ALU elements in humans.		01	Lecture Method. PPT presentation.You Tube animation.https://youtu.be/PErzQijx0ds
	EXAM ON UNIT-7		01	An Exam was held in GC on 19th Dec on Unit 7
	Assessment: End-term Test		Total: 40Hrs	

Resources :

16. Books:iGenetics (A Molecular Approach Third Edition) Peter J. Russel

GENETICS (Principles and Analysis Fourth Edition).Principles of GENETICS SIXTH EDITION (SNUSTAD . SIMMONS).

17. Other resources : Internet sources such as Wikipedia. Some links like ocw.mit.edu

*Remarks will specify

For CBCS courses

- The nature of the class-topic (viz. Theoretical, Practical, and Tutorial).
- Methodology of teaching (whether using ICT, engaging students in group discussion, quiz etc. etc.)
- Different modes of assessment. (Please check UGC evaluation reforms).

Lesson Plan for Course: DSE, Code: ZOOADSE01T , Credit-4

Course coordinator: Rajashree Mallick

Course Outcome

- ✓ CO1:Upon completion the course the students will learn different types of animal behavior and its application
- ✓ CO2:Undarstandprosses of chronobiology in animal world
- ✓ CO3: Learn about biological rythem.
- ✓ CO4 : Enhancing their observation power and analyzation ability.

Course planner

Sl	Course Topic	Teacher	Class-hour	Remarks*
Jul				
28th	Unit 1: Introduction to Animal Behaviour	RAJASHREE MALLICK	**8**	Online using google meet
29th	A brief history of animal behaviour studies including the works of Fabre, Darwin, Von Frisch, Lorenz, Tinbergen,	RM		Online using google meet
30th	A brief history of animal behaviour studies including Jane Goodal, BirutéGaldikas, Dian Fossey, Salim Ali, Gopal Bhattacharyya, M. K. Chandrashekhar, RaghavendraGadagkar	RM		Online using google meet
Aug				
4th	The objectives of modern animal behaviour studies: Tinbergen's four questions	RM		Online using google meet
5th	Methods of studying behaviours: Observation vs Watching	RM		Online using google meet
6TH	Ad libitum observations, Focal animal studies, Instantaneous scan, etc.	RM		Online using google meet
12th	Class exam	RM		Online using google meet
13th	Branches of Animal Behaviour Studies	RM		Online using google meet
18th	**Unit 2: Behaviours of Individuals**	RM	**12**	Online using

				google meet
19th	Practical	RM		Making a project with online small group
20th	Class exam	RM		Online using google meet
21th	Reflexes and Orientations	RM		Online using google meet
26th	Reflexes and Orientations	RM		Online using google meet
27th	Exam	RM		Online using google meet
Sep				Online using google meet
3rd	Instinct	RM		Online using google meet
8th	Learning: Imprinting and other Programmed Learning	RM		Online using google meet
9th	Habituation, Innovations	RM		Online using google meet
10th	Practical	RM		Online demonstration using google meet
15th	Cultural Transmission / Social Learning	RM		Online using google meet
16th	Practical	RM		Online using google meet
22th	**Unit 3**: Social and Sexual Behaviour	RM	**9**	Online using google meet
23th	Concept of Sociality, Types of animal Society with examples	RM		Online using google meet
24th	Altruism	RM		Online using google meet
29th	Communications in animals- different types	RM		Online using google meet
30th	Insects' society with Honey bee as example	RM		Online using google meet
Oct				
1st	Foraging in honey bee and advantages of the waggle dance.	RM		Online using google meet
5th	Sexual Behaviour: Asymmetry of sex,	RM		Online using google meet
6th	Sexual dimorphism, Mate choice, Intra-sexual selection	RM		Online using google meet
7th	Inter-sexual selection (female choice), Sexual conflict in parental care	RM		Online using google meet
13th	Unit 4: Introduction to Chronobiology 1. Historical developments in chronobiology	RM	**4**	Online using google meet
14th	Biological oscillation: the concept of	RM		Online using

	Average, amplitude, phase and period			google meet
	Assessment: Mid-term Test	RM		Online using google meet
				Online using google meet
15th	Biological oscillation: the concept of Average, amplitude, phase and period	RM		Online using google meet
20th	Adaptive significance of biological clocks	RM		Online using google meet
Nov				
18th	Unit 5: Biological Rhythm Types and characteristics of biological rhythms	RM	**11**	Online using google meet
19th	Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms	RM		Online using google meet
24th	Concept of synchronization and masking	RM		Online using google meet
25th	Photic and non-photic zeitgebers	RM		Online using google meet
26th	Practical	RM		Online using google meet
Dec				Online using google meet
1st	Practical	RM		Online using google meet
2nd	Circannual rhythms	RM		Online using google meet
3rd	Photoperiod and regulation of seasonal reproduction of vertebrates	RM		Online using google meet
8th	Practical	RM		Online using google meet
9th	Role of melatonin	RM		Online using google meet
10th	Practical	RM		Online using google meet
			Total 44	

Resources :

18. Books:An Introduction to Animal Behaviour by Manning and Dawkins; 5th Ed. Cambridge Univ. Press
19. Animal Behavior_ An Introduction to Behavioral Mechanisms, Development, and Ecology
20. Other resources : Wikipedia
21. PPT.

Lesson Plan for Course: Endocrinology, Code: ZOOADSE03T, Credit: 04

Course coordinator: **Subharaj Paul**

Course Outcome:

- **CO1**:The basic objective of this DSE is to deliver the information to new comers on endocrine system with emphasis on the chemical structure of hormone, mechanism of hormone action, endocrine glands and their disorders.
- **CO2**:To understand the structure of hypothalamus and anterior pituitary and the associated hormones and the related disorders will be explained.
- **CO3**: Students learn the concepts of endocrine systems and homeostasis and 2 bioassay methods.
- **CO4**: Students also learn about the reproductive cycle of primates and non-primate mammals.

Course planner:

Sl	Course Topic	Teacher	Class-hour	Remarks*
Jul	**Unit**1: General idea of Endocrine systems, Classification, Characteristic and Transport of Hormones.	SP	01	Online classroommethod and PPT presentation, youtube video- https://www.youtube.com/watch?v=KSclrkk_Ako
Aug	Neurosecretions, and Neurohormones	SP	01	
	Unit 2: Structure of pineal gland, Secretions and their functions in biological rhythms and reproduction.	SP	03	
	Schedule for class exam on 28th Aug on **Unit**-1 in Google classroom.		01	Qu- Answer method.
	Structure and functions of hypothalamus and Hypothalamic nuclei.	SP	02	Study through E-Book (pdf format)
	Regulation of neuroendocrine glands, Feedback mechanisms; Structure of pituitary gland.	SP	04	Online Lecture method and PPT presentation.

For CBCS courses

	Pituitary Hormones and their functions, Hypothalamo-hypophysial-portal system. Disorders of pituitary gland.	SP	03	
Sep	**Unit** 3: Peripheral Endocrine Glands: Structure, Hormones, Functions and Regulation of Thyroid gland,	SP	03	
	Parathyroid	SP	02	Study through E-Book (pdf format)
	Pancreas,	SP	02	Lecture method and PPT presentation.
	Schedule for class exam on 25thSept on **Unit**-2 in Google classroom.		01	Qu- Answer method.
	Adrenal.	SP	03	
	Assessment: Mid-term Test			
Oct	Ovary and Testis;	SP	03	Oct 22nd to 17th Nov Puja vacation.
	Hormones in homeostasis, Disorders of endocrine glands.	SP	02	
	Schedule for class exam on 19thOct on **Unit**-3 in Google classroom.		01	Qu- Answer method.
	Unit 4: Mechanism of action of steroidal hormone		01	https://www.youtube.com/watch?v=m9jOXiYdMeY
Nov	**Unit** 4: Mechanism of action of non-steroidal hormones with receptors.	SP	02	Study through E-Book (pdf format)- https://www.youtube.com/watch?v=Nt2r5R0ZO5U
	Bioassays of hormones using RIA.	SP	01	Online lecture method and PPT presentation.*Book- immunology by Kuby* https://www.youtube.com/watch?v=hJ8AYS5rpyU
Dec	Bioassays of hormones using ELISA.	SP	01	

	Estrous cycle in rat and menstrual cycle in human;	SP	04	
	Multifaceted role of Vasopressin & Oxytocin; Hormonal regulation of parturition	SP	02	
	Schedule for class exam on 21st Dec on **Unit**-4 in Google classroom.		01	Qu- Answer method.
	Assessment: End-term Test		**Total: 43Hrs**	

Resources :

22. Books:Guyton 11th edition, Ganong W. - Review of medical physiology, Kronenberg_-_Williams_Textbook_of_Endocrinology_11e, endocrinology by Hadley, mammalian endocrinology by Ashoke Kr. Boral.
23. Other resources:internet source such as- Wikipidia, www.britannica.com, youtube.com

*Remarks will specify

- The nature of the class-topic (viz. Theoretical, Practical, and Tutorial).
- Methodology of teaching (whether using ICT, engaging students in group discussion, quiz etc. etc.)
- Different modes of assessment. (Please check UGC evaluation reforms).
-