Teaching Plan
Department of Zoology
Jagannath Barooah University, Jorhat
Academic Session: 2025-26

Name: Dr. Rashmi Rekha Saikia

Semester: I
Program: Major & VAC

Class/ Semester	Title & Code of The Paper Allotted (Credit)	Method of Teaching	Teaching Material	Unit	Topic	Period / Hours Required	Details of the Contents	Remarks / Books
Sem I	**ZOOMJ-011/T ANIMAL DIVERSITY & SYSTEMATICS**	White board, Power point presentation, Online video, Interaction with the students, Sudden tests, Seminars	Textbooks, Reference books, Diagrams, Models	Unit-4	**Pisces, Amphibia**	8 Hours	Characters & classification of Pisces, Osmoregulation and Migration of Fishes. General characters & classification of Amphibia, Adaptations for terrestrial life, Parental care in Amphibia. General characters & classification of Reptiles, Terrestrial adaptations in reptiles.	Kardong, K. V. (2018). *Vertebrates: Comparative Anatomy, Function and Evolution*. 8th Edition, Tata McGraw Hill Publishing Company. New Delhi
				Unit-5	**Amniotes; Reptiles; Aves; Mammalia**	7 Hours	General characters of birds; Flight adaptations. General characters; Affinities of prototheria.	
Sem I	**ZOOMJ-011/P ANIMAL DIVERSITY & SYSTEMATICS**	Dissection, Demonstration of Permanent slide, Museum specimen	Permanent slide, Museum specimen		**Chordate: Museum specimen** **Temporary mount**	5 Hours	Pristis, Hippocampus, Labeo, Icthyophis/Uraeotyphlus, Salamander, Rhacophorus Draco, Uromastix, Naja, Viper, model of Archaeopteryx, any three common birds- (Crow, duck, Owl), Squirrel and Bat. Temporary mounts of Unstained mounts of Placoid, Cycloid and Ctenoid scales	Kapoor, V C (2019). *Theory and Practice of Animal Taxonomy and Biodiversity*. Oxford & IBH Publishing
Sem I	**EVEVA–011 Environmental Education**	Lecture, Field Visit	Text book, Reports, Reference books	Unit-4	**Environmental degradation and its impacts**	8 Hours	Human population growth and its impacts on environment; land use change, deforestation, habitat fragmentation land degradation, soil erosion and desertification, Concept of environmental hazards. A brief account of air,	

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Sem I	**EVEVA–011 Environmental Education**	Lecture, Field Visit	Text book, Reports, Reference Books	Unit-5	**Conservation of Environment**	7 Hours	water, soil and noise pollutions- causes, effect and control measures, Concept of climate change: Green-house effect, global warming; ozone layer depletion, acid rains and their impacts on human communities and agriculture Concept of sustainability and sustainable development with judicious use of land, water and forest resources; afforestation. Conservation of nature and natural resources, man- animal conflict Environment Laws: Environment Protection Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols Environmental movements: Bishnois of Rajasthan, Chipko, Silent valley	

Semester: III
Program: Major

Class/ Semester	Title & Code of The Paper Allotted (Credit)	Method of Teaching	Teaching Material	Unit	Topic	Period/ Hours Required	Details of the Contents	Remarks / Books
Sem III	**ZOOMJ- 031/T Cell Biology**	Use of white board, Lecture, Power point presentation, Online video, Google classroom, Interaction with the students, Sudden tests, Seminars	Textbooks, Reference books, Diagrams, Models	Unit-5 Uni -6 Unit-7	**Cytoskeleton** **Nucleus** **Cell Division & Cell Signaling**	7 Hours 8 Hours 8 Hours	Structure and Functions: Microtubules, Microfilaments and Intermediate filaments Structure of Nucleus: Nuclear envelope, Nuclear pore complex, Nucleolus Chromatin: Euchromatin and Heterochromatin and packaging (nucleosome). Mitosis, Meiosis, Cell cycle and its regulation, normal and malignant cell growth, apoptosis, GPCR and Role of second messenger (cAMP).	Cooper, G.M. and Hausman, R.E. (2009). *The Cell: A Molecular Approach*. V Edition. ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008). *Molecular Biology of the Cell*, V Edition, Garland publishing Inc., New York and London.
Sem III	**ZOOMJ- 031/P Cell Biology**	Demonstration and preparation of Permanent slide	Slide, onion roots		**Slide preparation and slide showing**	8 Hours	Preparation of temporary stained squash of onion root tip to study various stages of mitosis Study of various stages of meiosis.	

Semester: V
Program: Major & Minor

Class/ Semester	Title & Code of The Paper Allotted (Credit)	Method of Teaching	Teaching Material	Unit	Topic	Period/ Hours Required	Details of the Contents	Remarks / Books
Sem V	**ZOOMJ- 051/T Molecular Biology**	Use of white board, Lecture Power point presentation, Online video, Google classroom, Interaction with the students, Sudden tests, Seminars	Textbooks, Reference books, Diagrams, Models, Charts	Unit-1 Unit-2 Unit-7	**Nucleic Acids** **DNA Replication** **DNA repair Mechanisms**	6 Hours 6 Hours 6 Hours	Salient features of DNA and RNA; Watson and Crick model of DNA DNA Replication in prokaryotes and eukaryotes, mechanism of DNA replication, Semi-conservative, bidirectional and semi-discontinuous replication, RNA priming, Replication of circular and linear ds-DNA, replication of telomeres Pyrimidine dimerization and mismatch repair.	Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter: *Molecular Biology of the Cell*, IV Edition Karp, G. (2010) *Cell and Molecular Biology: Concepts and Experiments*. VI Edition. John Wiley and Sons. Inc
Sem V	**ZOOMJ- 051/T Molecular Biology**	Hands-on practical work	Culture media, Bacterial culture			8 Hours	Preparation of liquid culture medium (LB) and raise culture of *E. coli* preparation of solid culture medium (LB) and growth of E. coli by spreading and streaking, Demonstration of antibiotic sensitivity/resistance of E. coli to antibiotic pressure and interpretation of results	
Sem V	**ZOOMJ- 054 Biotechnology & Bioinformatics/T**	Use of white board, Lecture Power point presentation, Online video, Google classroom, Interaction with the students, Sudden tests,	Textbook, Reference books, Diagrams, Models	Unit-2	**Molecular Techniques in Gene manipulation**	9 Hours	Cloning Principle, Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophage, BAC, YAC, and expression vectors (characteristics only) Restriction enzymes: Type II – Blunt end cutter and sticky end cutter, Transformation techniques: Calcium chloride method and electroporation.	Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009). *An Introduction to Genetic Analysis*. IX Edition. Freeman and Co., N.Y., USA

Class/ Semester	Title & Code of The Paper Allotted (Credit)	Method of Teaching	Teaching Material	Unit	Topic	Period/ Hours Required	Details of the Contents	Remarks / Books
		Seminars					Construction of genomic and cDNA libraries and screening by blue white colony selection method Blotting techniques- Southern, Northern and Western blotting; DNA sequencing: Sanger dideoxy sequencing method Polymerase Chain Reaction, DNA Finger Printing, Southern Blotting, DNA Sequencing (Sanger's Method), PCR, DNA fingerprinting,	Watson, J.D., Myers, R.M., Caudy, A. and Witkowski, J.K. (2007). *Recombinant DNA-Genes and Genomes-A Short Course*. III Edition, Freeman and Co., N.Y., USA
Sem V	**ZOOMJ- 054 Biotechnology & Bioinformatics/T**	Use of white board, Lecture Power point presentation, Online video, Google classroom, Interaction with the students, Sudden tests, Seminars		Unit-4	**Fundamentals of Bioinformatics**	9 Hours	Concept and scope of bioinformatics, Introduction to biological databases; Primary, secondary and composite databases; Nucleic acid databases (GenBank, DDBJ, EMBL); Protein databases (PIR, SWISSPROT, TrEMBL, PDB); Metabolic pathway database (KEGG); Small molecule databases (PubChem). Data mining and data mining tools (ENTREZ)	Pevsner, J (2009). *Bioinformatics and Functional Genomics*. II Edition Wiley- Blackwell
	ZOOMJ- 054 Biotechnology & Bioinformatics/P	Demonstration and in silico practical			**Bioinformatics**	7 Hours	Accessing biological database, Retrieval of nucleotide and protein sequences from databases, to perform pair-wise alignment of sequences (BLAST) and interpret the outcome, translate a nucleotide sequence and select the correct reading frame of the polypeptide from the output sequence	
Sem V	**ZOOMI- 054 Biotechnology & Bioinformatics/T**	Use of white board, Lecture Power point presentation,	Textbook, Reference books, Diagrams, Models	Unit-2	**Molecular Techniques in Gene manipulation**	9 Hours	Cloning Principle, Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophage, BAC, YAC, and expression vectors (characteristics only)	

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Sem V	**ZOOMI- 054 Biotechnology & Bioinformatics/T**	Online video, Google classroom, Interaction with the students, Sudden tests, Seminars	Textbook, Reference books, Diagrams, Models	Unit-2	**Molecular Techniques in Gene manipulation**	9 Hours	Restriction enzymes: Type II – Blunt end cutter and sticky end cutter, Transformation techniques: Calcium chloride method and electroporation. Construction of genomic and cDNA libraries and screening by blue white colony selection method Blotting techniques- Southern, Northern and Western blotting; DNA sequencing: Sanger dideoxy sequencing method Polymerase Chain Reaction, DNA Finger Printing, Southern Blotting, DNA Sequencing (Sanger's Method), PCR, DNA fingerprinting,	Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009). *An Introduction to Genetic Analysis*. IX Edition. Freeman and Co., N.Y., USA
				Unit-4	**Fundamentals of Bioinformatics**		Concept and scope of bioinformatics, Introduction to biological databases; Primary, secondary and composite databases; Nucleic acid databases (GenBank, DDBJ, EMBL); Protein databases (PIR, SWISSPROT, TrEMBL, PDB); Metabolic pathway database (KEGG); Small molecule databases (PubChem). Data mining and data mining tools (ENTREZ)	Pevsner, J (2009). *Bioinformatics and Functional Genomics*. II Edition Wiley- Blackwell
Sem V	**ZOOMI- 054 Biotechnology & Bioinformatics/P**	Demonstration and in silico practical			**Bioinformatics**	7 Hours	Accessing biological database, Retrieval of nucleotide and protein sequences from databases, to perform pair-wise alignment of sequences (BLAST) and interpret the outcome, translate a nucleotide sequence and select the correct reading frame of the polypeptide from the output sequence	