



FATIMA COLLEGE (AUTONOMOUS), MADURAI – 625018

NAME OF THE PROGRAMME: M. SC ZOOLOGY

PROGRAMME CODE: PSZO

Students will be able to

PROGRAMME OUTCOMES:

- **PO1:** Apply acquired scientific knowledge to solve major and complex issues in the society/industry.
- **PO2:** Attain research skills to solve complex cultural, societal and environmental issues.
- **PO3:** Employ latest and updated tools and technologies to solve complex issues.
- **PO4:** Demonstrate Professional Ethics that foster Community, Nation and Environment Building Initiatives.

PROGRAMME SPECIFIC OUTCOMES:

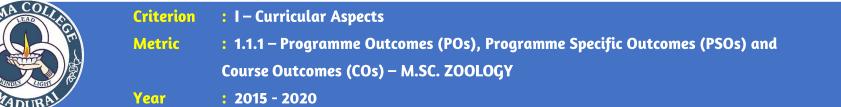
On completion (after two years) of M.Sc. Zoology programme, the graduates would be able to

PSO 1: Gain comprehensive knowledge in different branches of zoology – Cell & Molecular Biology, Biochemistry, Microbiology, Developmental Biology, Immunology, Genetics, Biotechnology, Bioinformatics and Evolution.

Criterion : I - Curricular Aspects Metric : 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) - M.SC. ZOOLOGY Year : 2015 - 2020



- **PSO 2:** Interrelate the concepts of gene, genome, cell, tissue, organ and organ-system in the physiological adaptations, development, reproduction, behavior of microbes, plants and animals
- **PSO 3:** Perform experiments in the field of Microbiology, Biochemistry, Cell & Molecular Biology, Environmental Biology, Developmental Biology, Biostatistics, Immunology, Genetics, Biotechnology and Bioinformatics.
- **PSO 4:** Develop empathy towards conservation of plants and animals and appreciate the diversity of animals and their inclusiveness in the sustenance of an ecosystem.
- **PSO 5:** Express ideas and concept through oral presentation and organize research data in the form of dissertation writing.
- **PSO 6:** Solve the environmental, social and ethical problems by applying the biological principles for minimizing pollutants by waste water treatment and solid waste management for eco-sustainable development.
- **PSO 7:** Address the local, regional, national and global environmental issues and mitigating the same through Intervention strategies adopting standard protocol.
- **PSO 8:** Practice judicious way of using animals in experiments, proper disposal of hazardous biological waste and ethics related to conserving endangered animals and plants.





- **PSO 9:** Exhibit the holistic growth by developing interpersonal skills, subject proficiency, and to seek employability in clinical laboratory, Research institutions, Medical coding and IT companies.
- **PSO10:** Make them self employed/ Entrepreneur in the field of Sericulture, Fisheries and Aquaculture, Dairy farming, Apiculture and Poultry.
- **PSO11:** Use of computers for Power point presentation, Virtual Dissection, analysis of bio- molecules using bioinformatics software and computing biological data.
- **PSO12:** Healthy diet pattern for combat life style disorder.



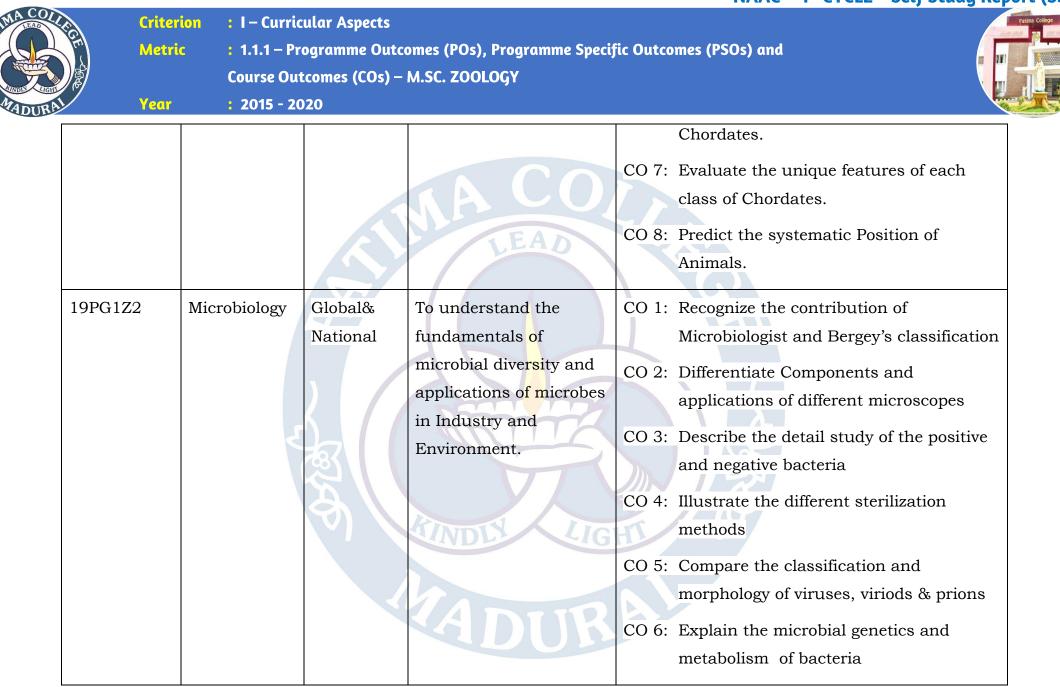


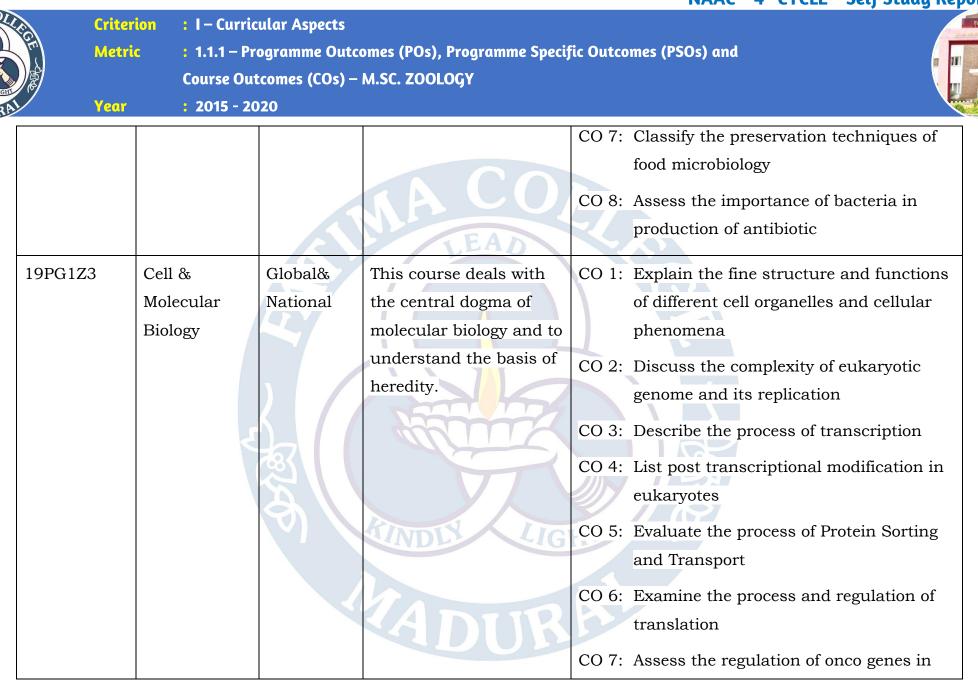
Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGYYear: 2015 - 2020



2019-2020

COURSE CODE	COURSE TITLE	NATURE OF THE COURSE (LOCAL/ NATIONAL/ REGIONAL/ GLOBAL)	COURSE DESCRIPTION	COURSE OUTCOMES
19PG1Z1	Animal Diversity	All the Three	This course provides an overview of the Invertebrate and Vertebrate animals by focussing on the General characters, Classification, Special features and Biology of some selected Invertebrates and Vertebrates.	 CO 1: Recall the levels of organization among Invertebrates. CO 2: Bring out the General characters of Invertebrates. CO 3: Classify the Phyla of Invertebrates up to class level. CO 4: Distinguish between Invertebrates and Chordates. CO 5: Classify the Classes of Chordates up to order level. CO 6: Analyse the General characters of





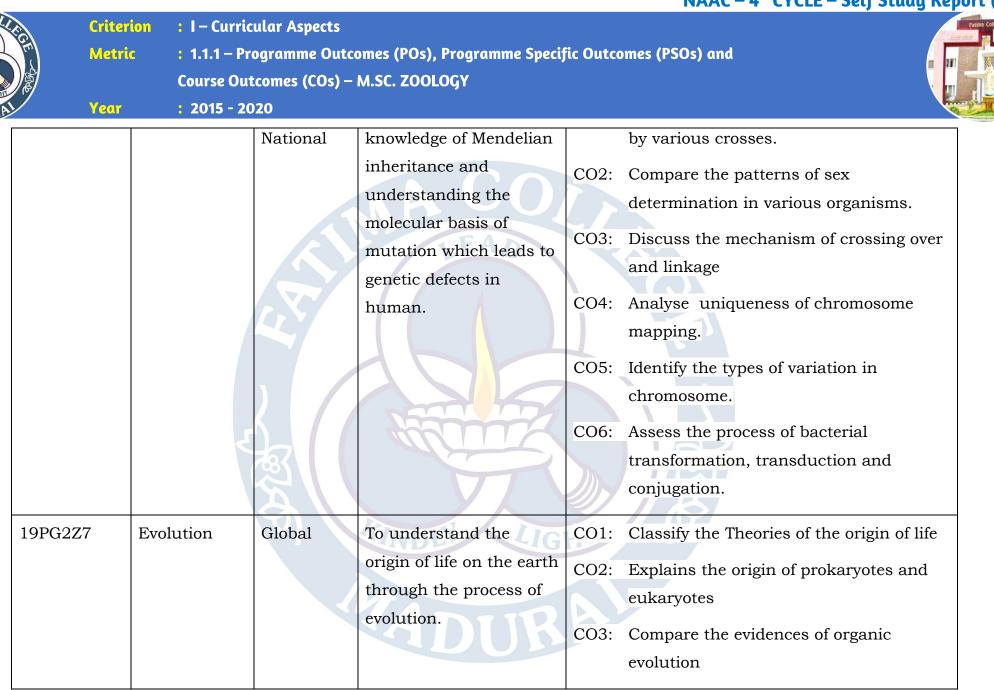


Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGYYear: 2015 - 2020



19PG1Z4	Lab In Animal	All the	This course deals with	promoting cancer CO 8: Analyze the pathways of intracellular signal transduction CO 1: Identify the diversity of animals.
	Diversity &Microbiology	Three	the learning skills of microbial techniques and fundamentals of diversity of species.	 CO 1. Identify the diversity of diminals. CO 2: Explain the fundamental organization of cells. CO 3: Prepare different types of media. CO 4: Demonstrate bacterial isolation technique and maintain pure culture. CO 5: Identify unknown bacteria by biochemical testing.
19PG1Z5	Lab In Cell & Molecular Biology	Global & National	It includes cell biology experiments such as observation of mitotic stages in onion root tip and visualizing giant chromosome in	 CO 1: Identify and sketch the various microscopy CO 2: Recall the preparation of tissues CO 3: Estimate the quantity of DNA and RNA CO 4: Infer the qualitative estimation of DNA

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ALCE - CONTRACT	Criterion Metric	n : I – Curricular Aspects : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY				
	Year	: 2015 - 20	020			
				Chironomus larva and		and RNA
				isolation and estimation of DNA and RNA.	CO 5:	Compute the mitotic index
				of DIVA and KNA.	CO 6:	Demonstrate the isolation of genomic
				LEAD	K.	DNA
					CO 7:	Interpret the mitotic stages of onion root
						tip
19PGZI	EDC1 H	Ierbal	National &	This course deals with	CO 1:	Make use of alternative medicinal
	Μ	Iedicine	regional	the study of m <mark>ed</mark> icinal		methods.
				plants and therapeutic	CO 2:	Outline the importance of herbs used in
				values of herbs.		day today life.
			1		CO 3:	Categorize the usage of herbs for
			A		劉	different ailments.
				KINDLY LIG	CO 4:	Solve the life style disorders with food
						supplements.
					COF	Prepare various herbal products.
				(A DITR	0.5:	
19PG22	Z6 G	enetics	Global&	This course provides the	CO1:	Find the pattern of inheritance of traits



60						NAAC – 4 th CYCLE – Self Study Repor
	Criterio	on : I – Curri	cular Aspects			
TT I	Metric	: 1.1.1 – Pr	rogramme Outo	comes (POs), Programme Speci	fic Outco	omes (PSOs) and
		Course Ou	tcomes (COs) –	M.SC. ZOOLOGY		
URAL	Year	: 2015 - 20	020			
					CO4:	Categorize the theories of evolution
					CO5:	Describe the mechanism of evolution
					CO6:	List down the types of natural selection
				LEAD		and speciation
					CO7:	Compare the human evolution with
						primates
					CO8:	Organise the fossil records and dating
						methods
19PG	2Z8	Biochemistry	Global&	The course is designed	CO 1:	Recall the fundamental principles of
			National	to provide firm		Biochemistry.
			<u>્</u>	foundation in the	CO 2:	Summarize the metabolic pathways of
			A.V	principles of	E)	carbohydrates in the living organisms.
				Biochemistry by	CO 3.	Make use of flow charts to depict the
				providing knowledge on	000.	metabolic functions of Glucose.
				structure,		
				ADID	CO 4:	Recall the structure and general
				KUUS		properties of amino acids.
					CO 5:	Describe the structural organization of

						NAAC – 4" CYCLE – Self Study Report (
	Criterion Metric	: 1.1.1 – Pro	-	comes (POs), Programme Specif M.SC. ZOOLOGY	fic Outco	omes (PSOs) and
	Year	: 2015 - 202		TEAD LEAD	CO 7: CO 8:	 the proteins. Evaluate how the metabolism of organic compounds leads to the generation of ATP. Determine the metabolic levels of Starvation. Assess the metabolic pathway of biomolecules. Describe the mechanism of enzyme action
19PG2	Ger		All the Three	This course deals with the laboratory experiments that teach the concepts of inheritance of genes and to explore evolutionary dynamics.	CO 2: CO 3:	Determine the sex in man by Barr bodies. Experiment with the simple Mendelian traits. Examine the process of Sex determination in man and fruit fly. Construct the Pedigree charts by



Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
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					· · · · · · · · · · · · · · · · · · ·
					systematic listing of parents.
				CO 5:	Relate the genotypic frequencies by
			MACU.		Hardy-Weinberg equilibrium.
19PGZEDC2	Herbal	National &	This course deals with	CO 1:	Make use of alternative medicinal
	Medicine	Regional	the study of medicinal		methods.
			plants and therapeutic	CO 2:	Outline the importance of herbs used in
			values of herbs.		day today life.
				CO 3:	Categorize the usage of herbs for
					different ailments.
	5			CO 4:	Solve the life style disorders with food
		<u>ب</u> ع			supplements.
		a. I		CO 5:	Prepare various herbal products.
			KINDLY LIG	TH	
			11000		
			ADUK		

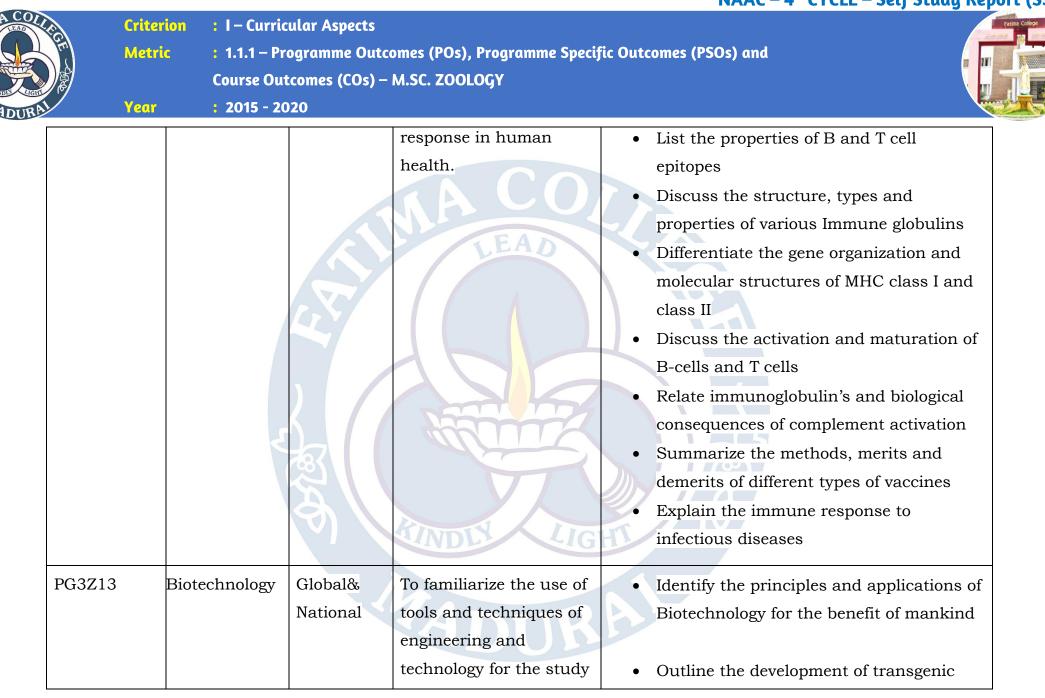


Criterion : I – Curricular Aspects

Metric : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY



A	Year	: 2015 - 20)20		
	COURSE CODE	COURSE TITLE	NATURE OF THE COURSE (LOCAL/NAT IONAL/REGI ONAL/ GLOBAL)	COURSE DESCRIPTION	COURSE OBJECTIVES
	Off Class	SPSS	Global& National	It provides hands on experience on the tools and techniques of SPSS statistical package.	 Apply the knowledge of research methodology and frame the hypothesis Explains the features of questionnaire Perform Students t test and ANOVA Interpret the results obtained through SPSS analysis tools Analyse the data SPSS Performs Hierarchical Clustering using SPSS software
	PG3Z12	Immunology	Global& National	To understand the function of immune system and to envisage the different immune	 Compare the innate and adaptive immunity Describe the structure and functions of immune cells and lymphoid organs



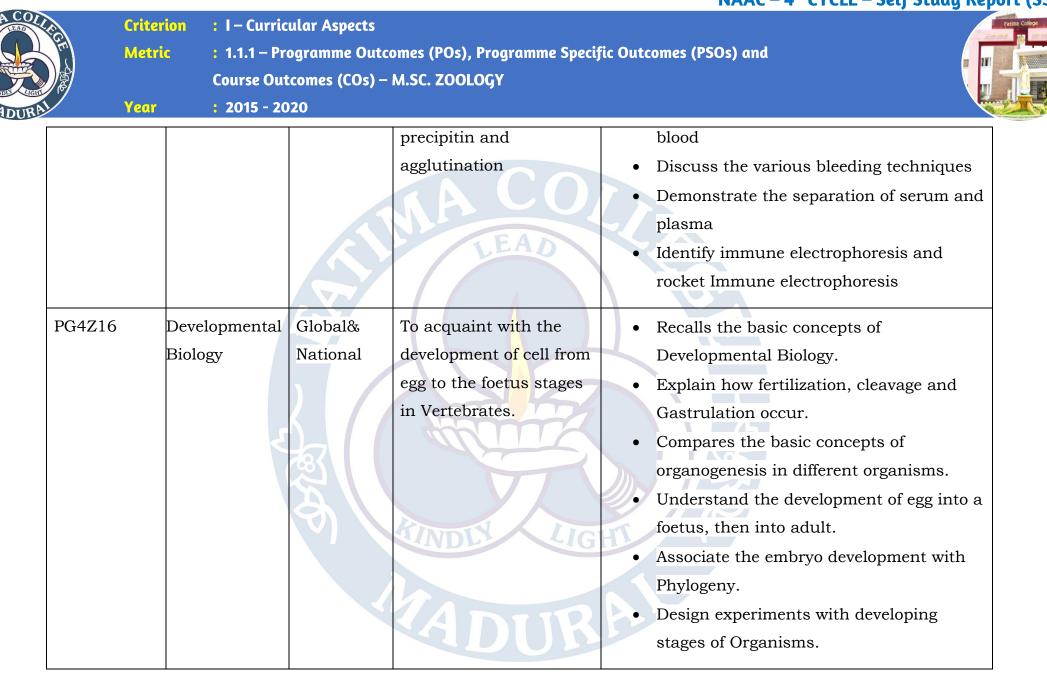
					NAAC – 4 th CYCLE – Self Study Report
COLLE	Criterion	: I – Currici	ular Aspects		Farina C
	Metric	: 1.1.1 – Pro	ogramme Outc	omes (POs), Programme Specific	Outcomes (PSOs) and
		Course Out	comes (COs) –	M.SC. ZOOLOGY	
DURAL	Year	: 2015 - 202	20		
				of living organisms, or	plants, animals, and microbes or
			ł	derivatives to make or	products for specific use
				modify products for	Discuss the solutions to problems
				specific use for human	concerning human activities in the field
				welfare.	of Agriculture, Medicine. Industry and
					Environment
DC 27		Y 1 where A and	A 11 / 1		
PG3ZE			All the	To impart knowledge on	Identify the economically important fishes
	Ac	quaculture	Three	Fisheries and	and fishery products.
				Aquaculture Practices in	• Plans according to the recent concepts in
				India.	fisheries management.
		4			• Distinguish the various aquaculture
			<u>8</u>		systems.
					Organizes the type of hatchery, brood
		V		KINDIN LICH	stock, larval production, feed
					management water quality and disease
					management in cultivable species, live
				ADD	feed production.
					Described the feed and disease
					management.



Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
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				• Evaluates the Fisheries and Aquaculture Practices in India.
PG3ZE2	Medical Entomology	All the Three	To give a general insight into the public health diseases and to study the biology of arthropods, epidemiology and vector control methods.	 Relate the role of Arthropods in public health Describe the biology of Arthropod vectors Evaluate the epidemiology of vector borne diseases
PG3Z14	Lab In Biotechnology	Global & National	This course provides rich knowledge in isolating DNA from different sources	 Demonstrate the plant tissue culture technique. Experiment with DNA isolation Estimate DNA quantitatively
PG3Z15	Lab In Immunology	Global & National	It focuses on techniques related to the field of immunology. It includes preparation of antigens and to visualize	 Identify and sketch the different lymphoid organs Recall the properties of soluble and particulate antigen Estimate the lymphocytes from peripheral





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Year : 2015 - 2020

PG4Z17	Environmental	All the	To understand the key	Relate the Status and Scope of
	Management	Three	aspects of	Biotechnology in Environmental
			environmental	protection
			conservation and its	• Discuss the methods of Bioremediation of
			applications in	wastes
			environmental issues for	• Describe the methods of conservation of
			sustainable	Biodiversity
			development.	
PG4Z18	Genetics	Global&	To understand the	• Find the pattern of inheritance of traits
		National	organization, functions	by various crosses.
	2		of genes and genetic	• Compare the patterns of sex
		<u>ب</u>	components and	determination in various organisms.
		a 11	appreciate the	• Discuss the mechanism of crossing over
			inheritance of genetic	and linkage
			material.	Analyse uniqueness of chromosome
				mapping.
			KANIR	Identify the types of variation in
				chromosome.
				Assess the process of bacterial



Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
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: 2015 - 2020

Year



		transformation, transduction and conjugation.
Mana	ronmental agement, lopmental gy &	 Find the primary productivity Demonstrate the estimation of various components of soil and water. Identify the zoo planktons in water sample. Analyse the various developmental stages of chick embryo. Compare the diversity of species by quadrate method. Experiment with the simple Mendelian traits

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Criterion : I – Curricular Aspects

: 2015 - 2020

Metric : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY



2018 - 2019

Year

COURSE CODE	COURSE TITLE	NATURE OF THE COURSE (LOCAL/ NATIONAL/ REGIONAL / GLOBAL)	COURSE DESCRIPTION	COURSE OBJECTIVES
PG1Z1	Biochemistry	Global& National	To impart knowledge on the structure, properties and metabolism of biomolecules and their interactions in the biological system	 Recall the fundamental principles of Biochemistry. Summarize the metabolic pathways of carbohydrates in the living organisms. Make use of flow charts to depict the metabolic functions of Glucose. Recall the structure and general properties of amino acids. Describe the structural organization of the proteins. Evaluate how the metabolism of organic compounds leads to the generation of ATP.

R.	Year	Course O : 2015 - 2) – M.SC. ZOOLOGY		
PG1Z2		biology	Global& National	To understand the fundamentals of microbial diversity and applications of microbes in Industry and Environment.		Determine the metabolic levels of Starvation. Assess the metabolic pathway of biomolecules. Describe the mechanism of enzyme action. Recognize the contribution of Microbiologist and Bergey's classification Differentiate Components and applications of different microscopes Describe the detail study of the positive and negative bacteria Illustrate the different sterilization
			9	KINDUS LIG	HT.	methods Compare the classification and morphology of viruses, viriods & prions Explain the microbial genetics and metabolism of bacteria Classify the preservation techniques of

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Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
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			A CO	food microbiology Assess the importance of bacteria in production of antibiotic
PG1Z3	Biophysics	Global& National	To imbibe the principles of physics involved in the structure of biomolecules, energy transformation in living systems and the use of modern physical instruments for the exploration of knowledge in biology.	Classify the chemical bonds and forces interacting between molecules Summarize the theories involved in acidity and basicity Explain the principles of Thermodynamics and biological oxidation Describe the principle, procedure, components involved and biological applications of Instruments Apply the principles of Photobiology in the Perception and Chemical Processing of Vision Assess the principles, properties applications and hazardous nature of Radioactive isotopes Interpret the Biophysical aspects of

		outcomes (COs	atcomes (POs), Programme Specij) – M.SC. ZOOLOGY	fic Outcomes (PSOs) and neurophysiology applied to the Animals • Organize the Biological importance and various domain of physics in Biology in the form of flow chart
PG1Z4	Lab in Biochemistry and Biophysics	Global& National	Introductory laboratory course in current principles and techniques applicable to research problems in biochemistry and molecular biology.	 Acquire skills in handling basic equipments Calculate the strength of unknown solutions using formula Estimate the various biomolecules using standard protocols Demonstrate experiments adopting appropriate procedures Critically analyze and interpret the results Design experiments to solve research problems
PG1Z5	Lab in Microbiology	Global& National	This course deals with the learning skills of microbial	Prepare different types of media.Demonstrate bacterial isolation technique

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Year

: 2015 - 2020

Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGY



			techniques		and maintain pure culture. Identify unknown bacteria by biochemical testing.
PGZEDC1	Herbal Medicine	National & Regional	To understand ethno botanical importance of indigenous medicinal plants and their implications for common ailments		 Make use of alternative medicinal methods. Outline the importance of herbs used in day today life. Categorize the usage of herbs for different ailments. Solve the life style disorders with food supplements. Prepare various herbal products.
PG2Z6	Cell & Molecular biology	Global& National	To comprehend the central dogma of molecular biology and to understand the molecular interactions at the cellular level.	H	Explain the fine structure and functions of different cell organelles and cellular phenomena Discuss the complexity of eukaryotic genome and its replication Describe the process of transcription

						NAAC – 4 th CYCLE – Self Study Report (
	Metric :	: 1.1.1 - P Course Ou	utcomes (COs)	s utcomes (POs), Programme Specif) – M.SC. ZOOLOGY	ic Outo	comes (PSOs) and
BAL	Year	: 2015 - 2		LEAD		List post transcriptional modification in eukaryotes Evaluate the process of Protein Sorting and Transport Examine the process and regulation of translation Assess the regulation of onco genes in promoting cancer Analyze the pathways of intracellular signal transduction
PG2Z7	' Biostati and Bioinfor		Global &National	To gain knowledge on various statistical tools available for biological samples and to understand the fundamentals of biological sequence analysis	A	Find the measures of central tendency and dispersion values Assess the difference between the expected and observed frequencies by Chi-Square test Compute degrees of relationship between two variables with reference to correlation and regression Test the hypothesis of mean of the

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·····	Year	: 2015 - 2		s) – M.SC. ZOOLOGY		variables whether significant or not through ANOVA Apply the statistical tools to calculate the data Enumerate the applications of
PG2Z8	Ecolog Evolut	-	All the Three	To understand the principles of ecology and animal interactions in an ecosystem that paves origin and evolution of life.	·	bioinformatics key interactions and processes C Explain the factors that affect population size, Density ,Distribution and dynamics Compare Ecological niche and habitat Design novel mechanism for the sustainable utilization of natural resources Explains the origin of prokaryotes and
				ADUR	A.	eukaryotes Compare the evidences of organic evolution Categorize the theories of evolution

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Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
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				Describe the mesh mism of employing
				• Describe the mechanism of evolution
				• List down the types of natural selection
				and speciation
PG2Z9	Lab in Ecology	All the	It includes Ecology &	Demonstrate the estimation of various
	& Evolution	Three	Evolutionary studies /	components of soil and water.
			experiments to assess the	• Find the primary productivity.
			interrelationship of human	• Identify the zooplankton in water sample.
			dimensions and	• Relate the genotypic frequencies by Hardy
			ecology/evolution	– Weinberg equilibrium.
PG2Z10	Lab in Cell &	Global&	It includes cell biology	Identify and sketch the various
	Molecular	National	experiments such as	microscope
	Biology		observation of mitotic	Recall the preparation of tissues
		9	stages in onion root tip	• Estimate the quantity of DNA and RNA
			and visualizing giant	Infer the qualitative estimation of DNA
			chromosome in	and RNA
			Chironomus larva and	Compute the mitotic index
			isolation and estimation of	• Demonstrate the isolation of genomic
			DNA and RNA.	DNA



Year

: 2015 - 2020

Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
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				Interpret the mitotic stages of onion root tip
PG2EDC2	Herbal Medicine	National & Regional	To understand ethno botanical importance of indigenous medicinal plants and their implications for common ailments	 Make use of alternative medicinal methods. Outline the importance of herbs used in day today life. Categorize the usage of herbs for different ailments. Solve the life style disorders with food supplements. Prepare various herbal products.
	Computer Applications For Biologists	Global& National	It provides hands on experience on the tools and techniques of bio informatics sequence analysis. It begins with the data storage in major biological databases,	 Apply MS-EXCEL for statistical analysis Retrieve nucleotide, protein sequences and protein structure Perform BLAST and FASTA Interpret the results obtained through bio informatics tools Model protein structure using Swiss pdb

Ye	Course (Outcomes (COs	utcomes (POs), Programme Specifi ;) — M.SC. ZOOLOGY	c Outcomes (PSOs) and
			retrieval of sequences and bioinformatics tools used for pair wise and multiple sequence alignment	viewer Illustrate the biological interactions of target protein and drugs
PG3Z12	Immunology	Global& National	To understand the function of immune system and to envisage the different immune response in human health.	 Compare the innate and adaptive immunity Describe the structure and functions of immune cells an dlymphoid organs List the properties of B and T cell epitopes Discuss the structure, types and properties of various Immune globulins Differentiate the gene organization and molecular structures of MHC class I and class II Discuss the activation and maturation of B-cells and Tcells Relate immune globulins and biological

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Self Study Report (SSR) NAAC Ath CVCIE

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	Criterion Metric	 I - Curricular Aspects 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) - M.SC. ZOOLOGY 				
A	Year	: 2015 - 2	2020	NA CO LEAD	 consequences of complement activation Summarize the methods, merits and demerits of different types of vaccines Explain the immune response to infectious diseases 	
PG3Z12	Biotec	chnology	Global& National	To familiarize the use of tools and techniques of engineering and technology for the study of living organisms, or derivatives to make or modify products for specific use for human welfare.	 Identify the principles and applications of Biotechnology for the benefit of mankind Outline the development of transgenic plants, animals, and microbes or products for specific use Discuss the solutions to problems concerning human activities in the field of Agriculture, Medicine. Industry and Environment 	
PG3ZE1		ries & culture	All the Three	To impart knowledge on Fisheries and Aquaculture Practices in India.	 Identify the economically important fishes and fishery products. Plans according to the recent concepts in 	

				NAAC – 4 th CYCLE – Self Study Report (S				
<u>o</u>	Aetric : 1.ª	: I – Curricular Aspects : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY						
	'ear : 20	015 - 2020						
			NA CO LEAD	 fisheries management. Distinguish the various aquaculture systems. Organize the type of hatchery, brood stock, larval production, feed management water quality and disease management in cultivable species, live feed production. Describe the feed and disease management. Evaluates the Fisheries and Aquaculture Practices in India. 				
PG3ZE2	Medical Entomolog	y All the Three	To give a general insight into the public health diseases and to study the biology of arthropods, epidemiology and vector control methods.	 Relate the role of Arthropods in public health Describe the biology of Arthropod vectors Evaluate the epidemiology of vector borne diseases 				



Year

: 2015 - 2020

Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGY



PG3Z14	Lab In Biotechnology	Global& National	This course provides rich knowledge in isolating DNA from different sources	 Demonstrate the plant tissue culture technique. Experiment with DNA isolation Estimate DNA quantitatively
PG3Z15	Lab In Immunology	Global& National	It focuses on techniques related to the field of immunology. It includes preparation of antigens and to visualize precipitin and agglutination	 Identify and sketch the different lymphoid organs Recall the properties of soluble and particulate antigen Estimate the lymphocytes from peripheral blood Discuss the various bleeding techniques Demonstrate the separation of serum and plasma Identify immune electrophoresis and rocket immune electrophoresis
PG4Z16	Developmental Biology	Global& National	To acquaint with the development of cell from egg to the foetus stages in	 Recalls the basic concepts of Developmental Biology. Explain how fertilization, cleavage and

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					NAAC – 4 th CYCLE – Self Study Report (SSR					
ANULA COLLER	Criterion Metric MADURAL Year		 : I - Curricular Aspects : 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) - M.SC. ZOOLOGY : 2015 - 2020 							
				Vertebrates.	 Gastrulation occur. Compares the basic concepts of organogenesis in different organisms. Understand the development of egg into a foetus, then into adult. Associate the embryo development with Phylogeny. Design experiments with developing stages of Organisms. 					
PG4Z1		onmental gement	All the Three	To understand the key aspects of environmental conservation and its applications in environmental issues for sustainable development.	 Relate the Status and Scope of Biotechnology in Environmental protection Discuss the methods of Bioremediation of wastes Describe the methods of conservation of 					

• Describe the methods of conservation of Biodiversity

To understand the

organization, functions of

Global&

National

PG4Z18

Genetics

							NAAC – 4 th CYCLE – Self Study Report (SSR	
A DURAL	Criterion Metric Year	 : I – Curricular Aspects : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY : 2015 - 2020 						
					genes and genetic components and appreciate the inheritance of genetic material.		 Compare the patterns of sex determination in various organisms. Discuss the mechanism of crossing over and linkage Analyse uniqueness of chromosome mapping. Identify the types of variation in chromosome. Assess the process of bacterial transformation, transduction and conjugation. 	
PG4Z1	Enviro Manag	onmental gement, opmental gy &	All the Three		This course deals with the laboratory experiments that teach the concepts of environmental clean inheritance of genes development of invertebrate and vertebrate model systems		 Find the primary productivity Demonstrate the estimation of various components of soil and water. Identify the zoo planktons in water sample.O4 Analyse the various developmental stages of chick embryo. Compare the diversity of species by quadrat method. 	



LEAD

			•	Experiment with the simple we
				traits

2017 - 2018

COURSE CODE	COURSE TITLE	NATURE OF THE COURSE (LOCAL/ NATIONAL/ REGIONAL/ GLOBAL)	COURSE DESCRIPTION	COURSE OBJECTIVES
PG1Z1	Biochemistry	Global& National	To impart knowledge on the structure, properties and metabolism of biomolecules and their interactions in the biological system	 Recall the fundamental principles of Biochemistry. Summarize the metabolic pathways of carbohydrates in the living organisms. Make use of flow charts to depict the metabolic functions of Glucose. Recall the structure and general properties

				NAAC – 4 th CYCLE – Self Study Report (SS			
Met	ric : 1.1.1 - I Course O	: I – Curricular Aspects : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY					
PG1Z2	Microbiology	2020 Global& National	To understand the fundamentals of microbial diversity and applications of microbes in Industry and Environment.	 of amino acids. Describe the structural organization of the proteins. Evaluate how the metabolism of organic compounds leads to the generation of ATP. Determine the metabolic levels of Starvation. Assess the metabolic pathway of biomolecules. Describe the mechanism of enzyme action. Recognize the contribution of Microbiologist and Bergey's classification Differentiate Components and applications of different microscopes Describe the detail study of the positive and negative bacteria Illustrate the different sterilization methods Compare the classification and morphology of viruses, viriods & prions 			

	Year	Course Outcomes (COs : 2015 - 2020	ourse Outcomes (COs) – M.SC. ZOOLOGY 2015 - 2020				
			NA CO LEAD	 Explain the microbial genetics and metabolism of bacteria Classify the preservation techniques of food microbiology Assess the importance of bacteria in production of antibiotic 			
PG1Z3	Bioph	nysics Global& National	To imbibe the principles of physics involved in the structure of biomolecules, energy transformation in living systems and the use of modern physical instruments for the exploration of knowledge in biology.	 Classify the chemical bonds and forces interacting between molecules Summarize the theories involved in acidity and basicity Explain the principles of Thermodynamics and biological oxidation Describe the principle, procedure, components involved and biological applications of Instruments Apply the principles of Photobiology in the Perception and Chemical Processing of Vision 			

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	Criterion	: I - Curricular Aspects		NAAC – 4 th CYCLE – Self Study Report (
TT L	Metric	: 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and							
R.		Course Outcomes (COs) – M.SC. ZOOLOGY							
	Year	: 2015 - 2020							
PG1Z4	Lab in Biocher and Biophy		Introductory laboratory course in current principles and techniques applicable to research problems in biochemistry and molecular biology.	 applications and hazardous nature of Radioactive isotopes Interpret the Biophysical aspects of neurophysiology applied to the Animals Organize the Biological importance and various domain of physics in Biology in the form of flow chart Acquire skills in handling basic equipments Calculate the strength of unknown solutions using formula Estimate the various biomolecules using standard protocols Demonstrate experiments adopting appropriate procedures Critically analyze and interpret the results Design experiments to solve research problems 					
PG1Z5	Lab in	Global &	This course deals with	Prepare different types of media.					

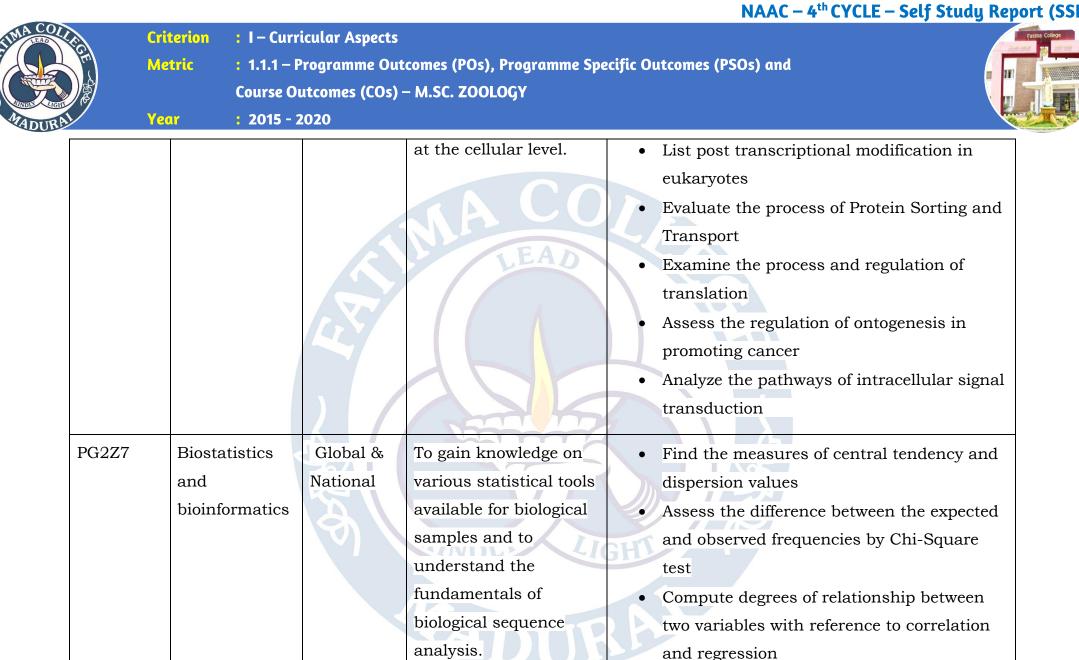
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Criterion : I – Curricular Aspects Metric : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY



	Microbiology	National	the learning skills of	Demonstrate bacterial isolation technique
			microbial techniques	and maintain pure culture.
				• Identify unknown bacteria by biochemical
			FAD	testing.
PGZEDC1	Herbal	National &	To understand ethno	• Make use of alternative medicinal methods.
	Medicine	Regional	botanical importance of	• Outline the importance of herbs used in
			indigenous medicinal	day today life.
			plants and their	• Categorize the usage of herbs for different
			implications in	ailments.
			common ailments	• Solve the life style disorders with food
				supplements.
		Ŕ	VI	• Prepare various herbal products.
PG2Z6	Cell and	Global &	To comprehend the	• Explain the fine structure and functions of
	Molecular	National	central dogma of	different cell organ sells and cellular
	biology		molecular biology and	phenomena
			to understand the	• Discuss the complexity of eukaryotic
			molecular interactions	genome and its replication
				• Describe the process of transcription



• Test the hypothesis of mean of the variables

Y		rse Outcomes (COs) 015 - 2020) – M.SC. ZOOLOGY	
PG2Z8	Ecology and Evolution	d All the Three	To understand the principles of ecology and animal interactions in an ecosystem that paves origin and evolution of life.	 whether significant or not through ANOVA Apply the statistical tools to calculate the data Enumerate the applications of bioinformatics Develop an understanding of ecological key interactions and processes Explain the factors that affect population size, Density ,Distribution and dynamics Compare Ecological niche and habitat Design novel mechanism for the sustainable utilization of natural resources Explains the origin of prokaryotes and eukaryotes Compare the evidences of organic evolution Describe the mechanism of evolution List down the types of natural selection and



Year

: 2015 - 2020

Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGY



				speciation
PG2Z9	Lab in Ecology and Evolution	All the Three	It includes Ecology & Evolutionary studies / experiments to assess the interrelationship of human dimensions and ecology/evolution	 Demonstrate the estimation of various components of soil and water. Find the primary productivity. Identify the zooplankton in water sample. CO 4 Relate the genotypic frequencies by Hardy – Weinberg equilibrium.
PG2Z10	Lab in Cell & Molecular Biology	Global & National	It includes cell biology experiments such as observation of mitotic stages in onion root tip and visualizing giant chromosome in Chironomus larva and isolation and estimation of DNA and RNA.	 Identify and sketch the various microscopy Recall the preparation of tissues Estimate the quantity of DNA and RNA Infer the qualitative estimation of DNA and RNA Compute the mitotic index Demonstrate the isolation of genomic DNA Interpret the mitotic stages of onion root tip

Me	Criterion : I – Curricular Aspects Metric : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY Year : 2015 - 2020							
PG2EDC2	Herbal Medicine	National & Regional	To understand ethno botanical importance of indigenous medicinal plants and their implications in common ailments	 Make use of alternative medicinal methods. Outline the importance of herbs used in day today life. Categorize the usage of herbs for different ailments. Solve the life style disorders with food supplements. Prepare various herbal products. 				
	Computer Applications For Biologists	Global & National	It provides hands on experience on the tools and techniques of bio informatics sequence analysis. It begins with the data storage in major biological databases, retrieval of sequences and bioinformatics	 Apply MS-EXCEL for statistical analysis Retrieve nucleotide, protein sequences and protein structure Perform BLAST and FASTA Interpret the results obtained through bio informatics tools Model protein structure using Swiss pdb viewer Illustrate the biological interactions of target protein and drugs 				

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Year

: 2015 - 2020

Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGY



			tools used for pair wise and multiple sequence alignment	
PG3Z12	Immunology	Global & National	To understand the function of immune system and to envisage the different immune response in human health.	 Compare the innate and adaptive immunity Describe the structure and functions of immune cells and lymphoid organs List the properties of B and T cell epitopes Discuss the structure, types and properties of various Immune globulins Differentiate the gene organization and molecular structures of MHC class I and class II Discuss the activation and maturation of B-cells and Tcells Relate immune globulins and biological consequences of complement activation Summarize the methods, merits and demerits of different types of vaccines



Year

: 2015 - 2020

Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGY



				• Explain the immune response to infectious diseases
PG3Z12	Biotechnology	Global & National	To familiarize the use of tools and techniques of engineering and technology for the study of living organisms, or derivatives to make or modify products for specific use for human welfare.	 Identify the principles and applications of Biotechnology for the benefit of mankind Outline the development of transgenic plants, animals, and microbes or products for specific use Discuss the solutions to problems concerning human activities in the field of Agriculture, Medicine. Industry and Environment
PG3ZE1	Fisheries And Aquaculture	All the Three	To impart knowledge on Fisheries and Aquaculture Practices in India.	 Identify the economically important fishes and fishery products. Plans according to the recent concepts in fisheries management. Distinguish the various aquaculture systems.

ÍO I	Metric : 1	I – Curricular Aspect 1.1.1 – Programme Ou ourse Outcomes (COs	utcomes (POs), Programme Spe	cific Outcomes (PSOs) and
		2015 - 2020		
			NA CO LEAD	 Organizes the type of hatchery, brood stock, larval production, feed management water quality and disease management in cultivable species, live feed production. Described the feed and disease management. Evaluates the Fisheries and Aquaculture Practices in India.
PG3ZE2	Medical Entomolo	ogy All the Three	To give a general insight into the public health diseases and to study the biology of arthropods, epidemiology and vector control methods.	 Relate the role of Arthropods in public health Describe the biology of Arthropod vectors Evaluate the epidemiology of vector borne diseases
PG3Z14	Lab In Biotechno	Global & ology National	This course provides rich knowledge in isolating DNA from	 Demonstrate the plant tissue culture technique. Experiment with DNA isolation

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Year

Criterion : I – Curricular Aspects

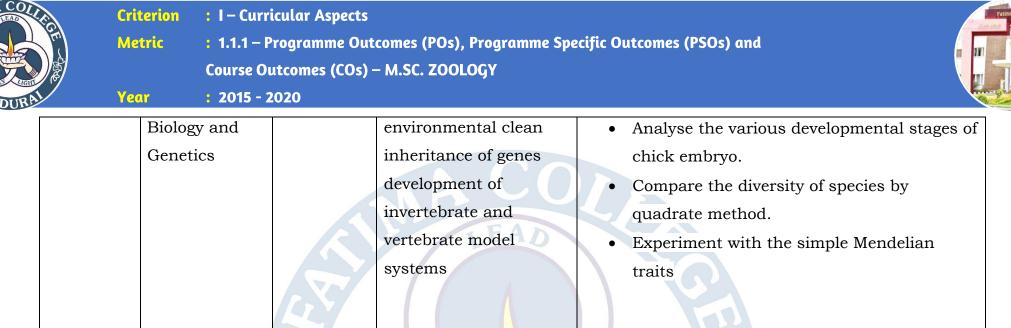
: 2015 - 2020

Metric : 1.1.1 – Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) – M.SC. ZOOLOGY



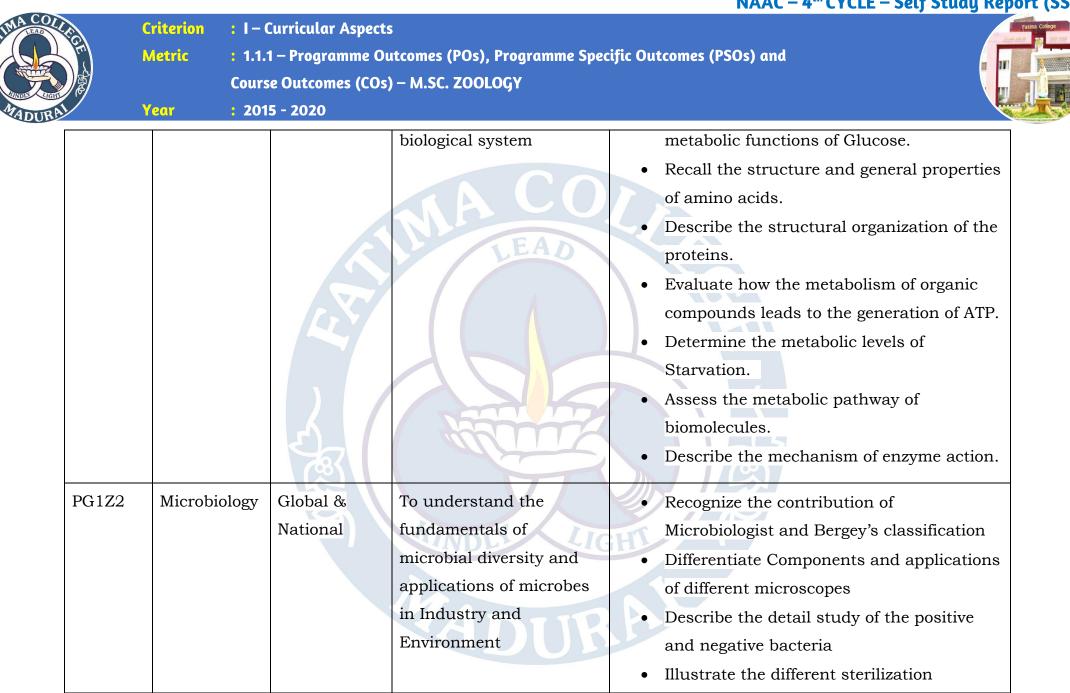
			different sources	Estimate DNA quantitatively
PG3Z15	Lab In Immunology	Global & National	It focuses on techniques related to the field of immunology. It includes preparation of antigens and to visualize precipitin and agglutination	 Identify and sketch the different lymphoid organs Recall the properties of soluble and particulate antigen Estimate the lymphocytes from peripheral blood Discuss the various bleeding techniques Demonstrate the separation of serum and plasma Identify immune electrophoresis and rocket Immune electrophoresis
PG4Z16	Developmental Biology and Genetics	Global & National	To understand the cellular and molecular mechanisms of development of invertebrate and vertebrate model	 Recalls the basic concepts of Developmental Biology. Compares the basic concepts of organogenesis in different organisms. Understand the development of egg into a foetus, then into adult.

					NAAC – 4 th CYCLE – Self Study Report (SSR)	
A COLUMN COLUMN	Criterion Metric Year	 : I - Curricular Aspects : 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) - M.SC. ZOOLOGY : 2015 - 2020 				
				systems	 Find the pattern of inheritance of traits by various crosses. Compare the patterns of sex determination in various organisms. Discuss the mechanism of crossing over and linkage Analyse uniqueness of chromosome mapping. 	
PG4Z1'		onmental gement	All the Three	To understand the key aspects of environmental conservation and its applications in environmental issues for sustainable development	 Relate the Status and Scope of Biotechnology in Environmental protection Discuss the methods of Bioremediation of wastes Describe the methods of conservation of Biodiversity 	
PG4Z18	Enviro Manag	n onmental gement, opmental	All the Three	This course deals with the laboratory experiments that teach the concepts of	 Find the primary productivity Demonstrate the estimation of various components of soil and water. Identify the zoo planktons in water sample. 	



2015 - 2016

COURSE CODE	COURSE TITLE	NATURE OF THE COURSE (LOCAL/NATIO NAL/REGIONAL /GLOBAL)	COURSE DESCRIPTION	COURSE OBJECTIVES
PG1Z1	Biochemistry	Global & National	To impart knowledge on the structure, properties and metabolism of biomolecules and their interactions in the	 Recall the fundamental principles of Biochemistry. Summarize the metabolic pathways of carbohydrates in the living organisms. Make use of flow charts to depict the



				NAAC – 4 CYCLE – Self Study Report
	Metric :	Course Outcomes (CC	ts Dutcomes (POs), Programme Specif Ds) – M.SC. ZOOLOGY	ric Outcomes (PSOs) and
PG1Z3		2015 - 2020	Biophysics which is an inter disciplinary course, deals with the discipline concerned with the application of the principles and methods of physics and the other physical sciences to the solution of biological	 methods Compare the classification and morphology of viruses, viriods& prions Explain the microbial genetics and metabolism of bacteria CO 7 Classify the preservation techniques of food microbiology Assess the importance of bacteria in production of antibiotic Classify the chemical bonds and forces interacting between molecules Summarize the theories involved in acidity and basicity Explain the principles of Thermodynamics and biological oxidation Describe the principle, procedure, components involved and biological applications of Instruments

A COZ				NAAC – 4 th CYCLE – Self Study Report (S
		: I – Curricular Aspe : 1.1.1 – Programme	ects e Outcomes (POs), Programme Speci	tific Outcomes (PSOs) and
			COs) – M.SC. ZOOLOGY	
ADURAL	Year :	2015 - 2020		
			problems.	Perception and Chemical Processing of
				Vision
				Assess the principles, properties
				applications and hazardous nature of
			LEAD	Radioactive isotopes
				• Interpret the Biophysical aspects of
				neurophysiology applied to the Animals
				Organize the Biological importance and
				various domain of physics in Biology in the
				form of flow chart
PG1Z4	Lab in	Global &	Introductory laboratory	Acquire skills in handling basic
	Biochemis	stry National	course in current	equipments
	and		principles and techniques	Calculate the strength of unknown
	Biophysics	.s	applicable to research	solutions using formula
			problems in biochemistry	Estimate the various biomolecules using
			and molecular biology.	standard protocols
			ADTID	Demonstrate experiments adopting
				appropriate procedures
				Critically analyze and interpret the results



Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGYYear: 2015 - 2020



				Design experiments to solve research problems
PG1Z5	Lab in Microbiology	Global &National	This course deals with the learning skills of microbial techniques	 Prepare different types of media. Demonstrate bacterial isolation technique and maintain pure culture. Identify unknown bacteria by biochemical testing.
PGZEDC1	Herbal Medicine	National & Regional	To understand ethno botanical importance of indigenous medicinal plants and their implications in common ailments	 Make use of alternative medicinal methods. Outline the importance of herbs used in day today life. Categorize the usage of herbs for different ailments. Solve the life style disorders with food supplements. Prepare various herbal products.
PG2Z6	Cell and Molecular	Global &	To comprehend the central dogma of	• Explain the fine structure and functions of

				NAAC – 4 CYCLE – Self Study Report (S
ALC .	Metric : 1. Cou	rse Outcomes (COs)	s utcomes (POs), Programme Spec) – M.SC. ZOOLOGY	cific Outcomes (PSOs) and
	Year : 20	National	molecular biology and to understand the molecular interactions at the cellular level.	 different cell organelles and cellular phenomena Discuss the complexity of eukaryotic genome and its replication Describe the process of transcription List post transcriptional modification in eukaryotes Evaluate the process of Protein Sorting and Transport Examine the process and regulation of translation Assess the regulation of onco genes in promoting cancer Analyze the pathways of intracellular signal transduction
PG2Z7	Biostatistics and bioinformati	National	To gain knowledge on various statistical tools available for biological samples and to	 Find the measures of central tendency and dispersion values Assess the difference between the expected and observed frequencies by Chi-Square

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R	Year	Course Outcomes (COs : 2015 - 2020) – M.SC. ZOOLOGY	
	CS		understand the fundamentals of biological sequence analysis.	 test Compute degrees of relationship between two variables with reference to correlation and regression Test the hypothesis of mean of the variables whether significant or not through ANOVA Apply the statistical tools to calculate the data Enumerate the applications of bioinformatics
PG2Z8	Ecology Evolutio		To understand the principles of ecology and animal interactions in an ecosystem that paves origin and evolution of life.	 Develop an understanding of ecological key interactions and processes Explain the factors that affect population size, Density ,Distribution and dynamics Compare Ecological niche and habitat Design novel mechanism for the sustainable utilization of natural resources Explains the origin of prokaryotes and

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	Criterion :	I – Curricular Aspect	S	Factors of Control of
THE L			utcomes (POs), Programme Speci	ific Outcomes (PSOs) and
18	9	Course Outcomes (COs) – M.SC. ZOOLOGY	
	Year :	2015 - 2020		
				eukaryotes
				Compare the evidences of organic
				evolution
				Categorize the theories of evolution
			LEAD	• Describe the mechanism of evolution
				• List down the types of natural selection
				and speciation
PG2Z9	Lab in	All the Three	It includes Ecology &	Demonstrate the estimation of various
	Ecology an	nd	Evolutionary studies /	components of soil and water.
	Evolution		experiments to assess the	• Find the primary productivity.
			interrelationship of	• Identify the zooplankton in water sample.
			human dimensions and	• Relate the genotypic frequencies by Hardy
		à l	ecology/evolution	– Weinberg equilibrium.
PG2Z10	Lab in Cel	ll Global &	It includes cell biology	Identify and sketch the various microscopy
	and	National	experiments such as	• Recall the preparation of tissues
	Molecular		observation of mitotic	• Estimate the quantity of DNA and RNA
	Biology		stages in onion root tip	• Infer the qualitative estimation of DNA and
			and visualizing giant	RNA

APTIN C



Criterion: I - Curricular AspectsMetric: 1.1.1 - Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and
Course Outcomes (COs) - M.SC. ZOOLOGYYear: 2015 - 2020



	[Ι	
			chromosome in	Compute the mitotic index
			Chironomus larva and	Demonstrate the isolation of genomic DNA
			isolation and estimation	• Interpret the mitotic stages of onion root
			of DNA and RNA.	tip
PG2EDC2	Herbal	National &	To understand ethno	Make use of alternative medicinal
	Medicine	Regional	botanical importance of	methods.
			indigenous medi <mark>c</mark> inal	• Outline the importance of herbs used in
			plants and their	day today life.
			implications in common	• Categorize the usage of herbs for different
			ailments	ailments.
		E		• Solve the life style disorders with food
		A		supplements.
		À		Prepare various herbal products.
Off Class	Computer	Global &	It provides hands on	• Apply MS-EXCEL for statistical analysis
	Applications	National	experience on the tools	• Retrieve nucleotide, protein sequences and
	For		and techniques of	protein structure
	Biologists		bioinformatics sequence	Perform BLAST and FASTA
			analysis. It begins with	• Interpret the results obtained through bio

