

FATIMA COLLEGE

(Autonomous)

Affiliated to Madurai Kamaraj University
Re-Accredited with 'A++' by NAAC (Cycle - IV)
Mary Land, Madurai - 625018, Tamil Nadu

AQAR – QUALITATIVE METRIC

2023 - 2024

Criterion 1 - Curricular Aspects

1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme specific outcomes (PSOs) and Course Outcomes (COs), of the Programmes offered by the Institution.

Name of the Programme: B.Sc. ZOOLOGY

Programme Code: UAZO

Programme Outcomes:

PO 1	Apply acquired scientific knowledge to solve complex issues.
PO 2	Attain Analytical skills to solve complex cultural, societal and environmental issues.
PO 3	Employ latest and updated tools and technologies to analyse complex issue.
PO 4	Demonstrated Professional Ethics that foster Community, Nation and Environment Building Initiatives.
PO 5	Apply the knowledge and skill to take up higher education, entrepreneurship and employment in government and private sectors.



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Programme Specific Outcomes:

PSO 1	Gain comprehensive knowledge in different branches of Zoology – Invertebrata, Chordata, Cell biology, Physiology, Environmental Biology, Biochemistry, Microbiology, Immunology, Embryology, Entomology, Genetics, Molecular Biology, Biotechnology, Biostatistics, Bioinformatics and Evolution.
PSO2	Acquire technical skills in performing experiments in the field of Microbiology, Cell Biology, Biochemistry, Plant Physiology, Human Physiology, Molecular Biology, Environmental Biology, Developmental Biology, Biostatistics, Immunology, Evolution, Genetics, Clinical Laboratory Techniques, Biotechnology and Bioinformatics.
PSO 3	Develop empathy and instill love towards conserving plants and animals.
PSO 4	Express ideas and concept through seminar and assignments.
PSO 5	Solve the environmental problems by applying the biological principles for minimizing pollutants in air, water and land.
PSO 6	Develop environmental concern towards value of economically important plants, Biodiversity promote Bioremediation, Bio fertilizer and vegetative propagation.



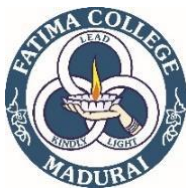
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PSO 7	Adopt Good Laboratory Practice, bioethics and biosafety guidelines to ensure minimal use of animals during experiments.
PSO 8	Exhibit the holistic growth by developing subject proficiency, interpersonal skills, and show vertical mobility in taking up PG courses and horizontal mobility by enrolling in B.Ed institution, clinical laboratory course and seek employment in schools, Medical coding and IT companies.
PSO 9	Make them self employed/ Entrepreneur in the field of Sericulture, Vermitechnology, Ornamental fish culture, Dairy farming, Apiculture, Mushroom cultivation and Horticulture.
PSO 10	Use of computers for Power point presentation, Virtual Dissection, analysis of bio- molecules using bioinformatics tools and computing biological data.
PSO 11	Healthy diet pattern for combat life style disorder.

Course Outcomes:

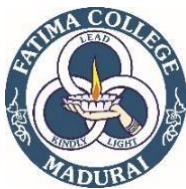


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Course Code	Course Title	Nature of the Course (Local/ National/ Regional/ Global)	Course Description	Course Outcomes
23Z1CC1	Invertebrata	Local, National, Regional and Global	This course provides an overview of the Invertebrate animals by focussing on the General characters, Classification, Special features and Biology of some selected Invertebrates.	<p>CO 1 Understand the basic concepts of invertebrate animals and recall its structure and functions.</p> <p>CO 2 Illustrate and examine the systemic and functional morphology of various groups of invertebrata.</p> <p>CO 3 Differentiate and classify the animal's mode of life in various taxa and estimate the biodiversity.</p> <p>CO 4 To compare and distinguish the various physiological processes and</p>

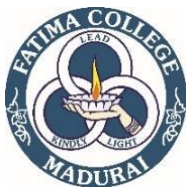


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				organ systems in lower animals. CO 5 Infer and integrate the parasitic and economic importance of invertebrate animals.
23Z1CC2	Invertebrata Lab Course	Local, National, Regional and Global	This course provides an overview of Invertebrate animals by focussing on the General characters, Classification, Special features and Biology of some selected Invertebrates.	CO 1 Identify and label the external features of different groups of invertebrate animals. CO 2 Illustrate and examine the circulatory system, nervous system and reproductive system of invertebrate animals. CO 3 Differentiate and compare the structure, function and mode of life of various groups of animals. CO 4 To compare and distinguish the dissected internal organs of lower animals.



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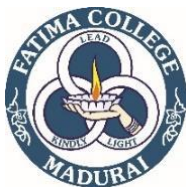
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				CO 5 Prepare and develop the mounting procedure of economically important invertebrates.
23Z1SE1	Ornamental Fish Farming & Management	Local, National, Regional and Global	This course familiarizes basic principles, themes and steps needed to set-up and maintain an aquarium.	<p>CO 1 To recall the basic concepts, Scope and importance of ornamental fish culture</p> <p>CO 2 The students will be able to identify, culture, maintain and market the commercially important ornamental fishes.</p> <p>CO 3 Explain the process of food preparation.</p> <p>CO 4 Identify the symptoms of various diseases prevalent in aquarium fishes.</p> <p>CO 5 To analyze the knowledge and skills gained on the different aspects of ornamental fish keeping will enable the students to develop entrepreneurship potential and help in self-employment.</p>

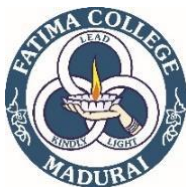


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23Z1FC	Fundamentals of Biology	Local, National, Regional and Global	This course aims to create interest for the subject and instill confidence among students.	CO 1 Recall the biological significance of biomolecules CO 2 Illustrate the structure and functions of cell and its organelles CO 3 Determine the concept of molecular biology and heredity. CO 4 Correlate the different life processes of human CO 5 Infer the concepts of ecology and evolution
23Z2CC3	Chordata	Local, National, Regional and Global	This course imparts knowledge on the salient features, classification and uniqueness of the Classes of	CO 1 Classify, Identify and recall the name and distinct features of different subphylum belonging to phylum Chordata. CO 2 Explain, and relate the origin, structural organization and evolutionary aspects of vertebrates. CO 3 Analyze, compare and distinguish the developmental



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			Phylum Chordata.	stages and describe the important biological process. CO 4 Correlate the different modes of life and parental care among different vertebrates. CO 5 Summarise the morphology and ecological adaptations in vertebrates and list out the economic importance.
23Z2CC4	Chordata Lab Course	Local, National, Regional and Global	This Course aims to develop the ability to Identify the salient features of Chordates.	CO 1 Identify and label the external features of different groups Chordate animals. CO 2 Illustrate and examine the circulatory system, nervous system and reproductive system of Chordate animals. CO 3 Differentiate and compare the structure, function and mode of life of various groups of animals. CO 4 To compare and distinguish the dissected



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				<p>internal organs of lower animals.</p> <p>CO 5 Prepare and develop the mounting procedure of economically important Chordate</p>
23Z2SE2	Bio composting For Entrepreneurship	Local, National, Regional and Global	<p>This course imparts knowledge on biocomposting methods and hands on experience on the preparation of biocompost and its applications in solid waste management and motivate</p>	<p>CO 1 To understand the basic concepts and process of biocomposting</p> <p>CO 2 To demonstrate biocomposting techniques for various end applications like solid waste management, industrial waste recycling using sugarcane bagasse, etc..</p> <p>CO 3 To foster the skills on the preparation of quality biocompost by recycling the waste</p> <p>CO 4 To infer and integrate the applications of biocompost</p> <p>CO 5 To design and estimate the economic cost of</p>



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			the learners to become an entrepreneur	establishing small Biocompost units as a cottage industry.
23Z2SE3	Aquarium Keeping	Local, National, Regional and Global	This course familiarizes the status and the importance of ornamental fish industry	<p>CO 1 List the types of aquarium.</p> <p>CO 2 Identify the exotic and endemic varieties of ornamental fishes.</p> <p>CO 3 Outline the physico – chemical parameters in setting and management of aquarium Farm.</p> <p>CO 4 Explain the techniques followed in feeding, handling and transport of ornamental fish.</p> <p>CO 5 Identify the common freshwater and marine ornamental fishes based on common characters and sexual dimorphism.</p>
19Z3CC7	Human Physiology	Global & National	The course focuses on	CO 1 Associate the basic components and functions of



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			the complex organization of different organ systems and their functions.	<p>the digestive system and their diseases.</p> <p>CO 2 Organise structure and functions of the respiratory and circulatory system and their diseases.</p> <p>CO 3 Recognize the organs and functions of urinogenital system and their disease.</p> <p>CO 4 Identify the organs, theories and functions of neuromuscular system and their diseases.</p> <p>CO 5 Analyze the structure and functions of Endocrine glands and sense organs and their disorder.</p>
19Z3CC8	Environmental Biology	Local, National, Regional and Global	Review of ecological concepts to the understanding of	<p>CO 1 Paraphrase the structure and function of the Ecosystems</p> <p>CO 2 Identify the characteristics of a population and their interactions.</p>



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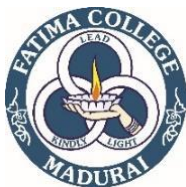
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			Environment al biology.	CO3 Categorize community characteristics and value natural resources. CO4 Recognize the importance of Biodiversity and its conservation. CO5 Show the consequences of Human actions on global environment.
19Z3CC9	Lab- Human Physiology & Environmental Biology	Local, National, Regional and Global	The course focuses on the interactions between organisms and the environment, and the consequence of these interactions in natural populations, communities and the	CO 1 Associate the effect of pH and temperature on salivary amylase activity in man. CO 2 Infer the qualitative analysis and estimation of biomolecules. CO 3 Compare the preparation of haemin and haemochromogen crystals. CO 4 Determine the amount of dissolved oxygen and carbon dioxide in the given water samples.

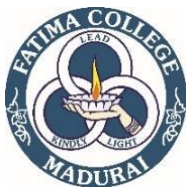


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			ecosystems through experimental approach.	CO 5 Prepare the models for food chain and food web in different ecosystem and identification of spotters.
19Z3SB1	Vermitechnology	Local, National, Regional and Global	This course imparts knowledge on the culture of earthworms and the preparation of vermicompost by recycling the waste through teaching and fieldtrip and eventually motivate the learners to become an	<p>CO1 Identify the different species of earthworm and elucidate the biology of earthworms</p> <p>CO2 Classify the ecological group of earthworms and discuss the role of earthworm in diverse applications.</p> <p>CO3 Organize the methods of Vermicomposting and identify factors affecting vermicompost.</p> <p>CO4 Analyse the physical, chemical and biological properties and maintenance of vermicompost.</p>

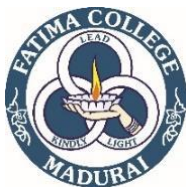


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			entrepreneur .	CO5 Examine the economics and prospects of vermiculture as self – employment avenues.
19Z3ACQ 1	Plant Diversity & Pathology	Local, National, Regional and Global	To understand the structure & life cycle of Plant groups	<p>CO 1 Recognize the structure, life cycle and economic importance of Algae & Fungi.</p> <p>CO 2 Identify the plant diseases & control methods and Lifecycle & uses of Lichens</p> <p>CO 3 Show general characters & life cycle of Bryophytes, Pteridophytes and Gymnosperms</p> <p>CO 4 Classify the Angiosperms & list their uses</p> <p>CO 5 Relate the plants to their economic uses</p>
19Z3ACQ 2	Lab- Plant Diversity & Pathology	Local, National, Regional and Global	To understand the structure and function	CO1 Construct suitable micro preparations



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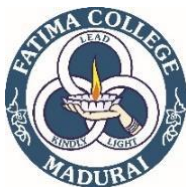
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			of different plant groups	<p>CO2 Construct sections of given plant materials with illustration and description</p> <p>CO3 Make use of dissection microscope to display the floral parts of Angiosperms</p> <p>CO4 Identify specimens and slides from Algae, Fungi, Lichens, Bryophytes, Pteridophytes and Gymnosperms included in the syllabus</p> <p>CO5 Identify the economically useful plants</p>
19C3ACZ 1	Animal Diversity, Physiology & Genetics	National	This course is designed for the chemistry student which discusses the branch of Zoology that deals with	<p>CO 1 Outline the general characters with of invertebrate and chordata with reference to organization, symmetry, body cavity</p> <p>CO 2 Explain the digestive system, role of enzymes, digestion and absorption of Carbohydrates, Protein and Fat in Man.</p>

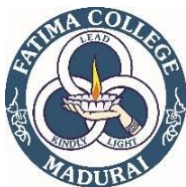


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			animal diversity, structure and function of various systems, development and inheritance of man.	CO 3 Distinguish between internal and external respiration in context to the mode and transport of gas exchange. CO 4 Summarize the structure and function of heart, Kidney, eye and ear. CO 5 Explain the Mendelian Laws Of Inheritance & Allelism
19C3ACZ 2	Lab- Animal Diversity, Physiology & Genetics	Local, National, Regional and Global	Students develop laboratory skills with identification of preserved specimen, manipulation of prepared slides, dissections and display	CO 1 Outline the Laboratory biosafety guidelines and good laboratory practices. CO 2 Dissect and mount the Body setae of Earthworm CO 3 List out the features of the given spotters <i>Amoeba</i> , <i>Taenia solium</i> , <i>Nereis</i> , <i>Amphioxus</i> (entire), <i>Anguilla</i> (Eel), Toad (<i>Bufo</i>), Cobra, Chamaeleon, Pigeon and various Syndromes.



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			under the microscope	CO 4 Choose the appropriate qualitative test for the analysis of carbohydrates, proteins, lipids, urea and uric acid in the given sample CO 5 Illustrate the structure of human ear, eye and heart.
19Z4CC10	Microbiology	Global & National	This course deals with the study of microorganisms and its interaction with the environment.	CO 1 Examine the culturing methods and phenotypic identification of microbes CO 2 Examine the taxonomical classification, reproduction and genetic recombination in bacteria CO 3 Elaborate the morphologic properties and cultivation of viruses. CO 4 Determine the role of microbes in the environment. CO 5 Correlate the technology of fermentation with the microbial production industrial products

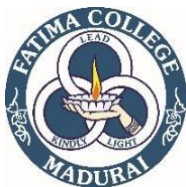


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19Z4CC1 1	Evolution	Global	The Course will provide a comprehensive knowledge on the history of evolutionary theories, evidences for evolution, origin of life, natural selection, speciation and human evolution	CO 1 Recognize the basic concepts of origin of life and evidences of evolution. CO 2 Paraphrase the theories of evolution CO 3 Examine the Modern synthetic theory and the factors causing variation. CO 4 Organize the types and salient features of natural selection and mimicry. CO 5 Interpret the concept of speciation and human evolution
19Z4CC1 2	Lab- Microbiology & Evolution	Local, National, Regional and Global	To gain skills in analyzing the clinical and environmental samples and to learn basic techniques	CO 1 Find the working Principle and Applications of instruments. CO 2 Demonstrate the microbiological techniques and water quality analysis



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			in microbiology and evolution	<p>CO 3 Identify the animals of evolutionary importance, adaptive coloration and in mimicry.</p> <p>CO 4 Identify the morphological evidences and the horse and human evolution model.</p> <p>CO 5 Analyze the Hardy – Weinberg equilibrium using beads.</p>
19Z4SB2	Mushroom Cultivation	Local, National, Regional and Global	Develop basic knowledge in mushroom cultivation and spawn production	<p>CO 1 State the prospects of mushroom cultivation</p> <p>CO 2 Devise a plan for mushroom production unit</p> <p>CO 3 Outline the techniques in cultivation, grading & processing of edible mushrooms</p> <p>CO 4 Identify and manage Insect-Pests and diseases affecting mushrooms.</p>



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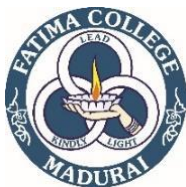
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				CO 5 Prepare a business plan for small scale enterprise
19Z4ACQ 3	Development al Botany & Plant Breeding	Local, National, Regional and Global	To study basic functioning of plant life.	CO1 Recall structure & functions of various plant tissue CO2 Paraphrase the mechanism of transpiration, photosynthesis, respiration & plant growth regulators CO3 Identify the structure & development Embryology of plant CO4 Examine techniques in the crop improvement programmes CO 5 Plan a home garden using horticultural techniques
19Z4ACQ 4	Lab- Development al Botany & Plant Breeding	Local, National, Regional and Global	To study basic functioning of plant life.	CO1 Illustrate the anatomy of Monocot and dicot stem , root and leaf CO2 Interpret experimental set ups in plant physiology



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				<p>CO3 Apply the horticultural techniques of Cuttage and layerage</p> <p>CO4 Make use of emasculation technique</p> <p>CO5 Identify specimens and slides from Plant anatomy, Physiology, Embryology, Plant Breeding & Horticulture included in the syllabus.</p>
19C4ACZ 3	Cell & Molecular Biology	National	This course is designed for the chemistry student which discusses the branch of Zoology that deals with Cell and Molecular Biology	<p>CO 1 Outline the general structure and function of a prokaryotic and eukaryotic cell.</p> <p>CO 2 Associate the structure and function of plasma membrane, mitochondria and endoplasmic reticulum</p> <p>CO 3 Summarize the structure of chromosome</p> <p>CO 4 Recall the structure and replication of DNA</p>

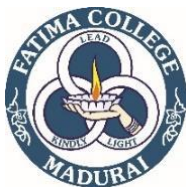


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				CO 5 Organize the events in translation, transcription and gene regulation in Prokaryotes
19C4ACZ 4	Lab- Cell & Molecular Biology	Local, National, Regional and Global	Students develop laboratory skills with identification of preserved specimen, manipulation of prepared slides, dissections and display under the microscope	<p>CO 1 Identify the squamous epithelial cells Under microscope</p> <p>CO 2 Dissect and mount the Polytene Chromosomes in the Salivary gland of <i>Chironomus</i> larva.</p> <p>CO 3 Interpret the mitotic stages from the squash preparation in Onion root tip</p> <p>CO 4 Recognize the features of the given spotters: Stages of Meiosis, Cellular organelles – Mitochondria, Endoplasmic reticulum, Golgi complex, Nucleus</p> <p>CO 5 Recall the structure and replication of DNA</p>

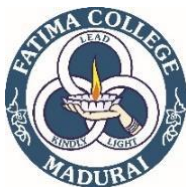


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19Z5CC1 3	Fundamentals of Biochemistry	Global & National	To familiarize the students with the structure and role of biomolecules and the physiochemical processes of the living beings	<p>CO 1 Describe the structural, properties, biological significance of carbohydrates, proteins and lipids.</p> <p>CO 2 Classify lipids based on their complexity</p> <p>CO 3 Classify amino acids and proteins based on their structure</p> <p>CO 4 Construct the flow chart to highlight the metabolic pathways of carbohydrates, proteins and lipids.</p> <p>CO 5 List down the factors affecting the normal functions of the enzymes and biological functions of the vitamins.</p>
19Z5CC1 4	Molecular Biology	Global & National	To understand the molecular processes of cells and the flow of	<p>CO 1 Illustrate the Watson and Crick model of DNA double helix; mechanism of DNA replication and the role of enzymes</p>

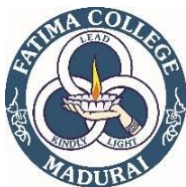


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			genetic information and to appreciate the regulatory mechanisms of gene expression by the complex interactions of biomolecules .	CO 2 Discuss the different types of DNA damages and repair mechanisms CO 3 Describe the transcription and translation in prokaryotes and eukaryotes CO 4 Discuss the post-transcriptional modifications, properties of genetic code and role of repressor in gene regulation CO 5 Employ the appropriate separation technique based on the size, shape, and charge of biomolecules
19Z5CC15	Lab-Biochemical Analysis	Local, National, Regional and Global	This course introduces the students to the biochemical analytical experiments for Carbohydrat	CO 1 Make use of the knowledge of basic principles of Biochemistry to carry out the biochemical experiments CO 2 Infer the outcome of the qualitative analytical tests of Biomolecules



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			es, Protein and Lipids by providing familiarization with the preparation of reagents, proper use of instrumentation and interpretation of the properties of the Biomolecules.	CO 3 Estimate the biomolecules using standard protocols CO 4 Develop skills in handling basic equipments CO 5 Develop familiarity with the principles of Laboratory safety
19Z5CC16	Lab-Molecular Biology	Local, National, Regional and Global	The course intends to provide hands on experience on techniques related to isolation and	CO 1 Estimate the pH of different samples CO 2 Infer the color changes in DNA and RNA estimation CO 3 Compute the Rf value for paper chromatography



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			estimation of DNA & RNA	CO 4 Demonstrate the genomic DNA isolation, DNA estimation and chromatography CO 5 Solve the presence of nucleic acid in the given sample
19Z5ME1	Biostatistics	Global & National	To study the statistical significance data and analysis of the Biological aspects in life	CO 1 Outline the importance of data collection and its types. CO 2 Estimate and interpret the data, by various measures including mean, median, and standard deviation. CO 3 Apply the basic numeric and graphical techniques to display and summarize the collected data. CO 4 Interpret statistical results effectively in context to Correlation and Regression. CO 5 Choose and apply appropriate statistical methods for analyzing one or two variables.

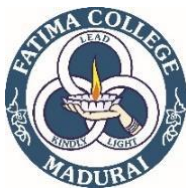


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19Z5ME2	Animal Behaviour	Local, National, Regional and Global	Students gain knowledge on learning, behaviour and biorhythm in animal.	CO 1 Outline the scope and history of Ethology CO 2 Explain the types of learning CO 3 Summarize the methods adopted by the animals in mate selection. CO 4 Discuss the various parameters controlling the behaviour in context to nerve and hormone CO 5 Recall the types and features of biological rhythm
19Z5SB3	Ornamental Fish Culture	Local, National, Regional and Global	To enable the students to be familiarized with ornamental fishes and to motivate them to become	CO 1 List the types of aquarium. CO 2 Plan the use of common aquarium ornamental fish and aquatic plants to decorate it. CO 3 Outline the physico – chemical parameters of water required for the growth of fish.



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			entrepreneur	<p>CO 4 Explain the techniques followed in ornamental fish breeding.</p> <p>CO 5 Identify the symptoms of various diseases prevalent in ornamental fish.</p>
19Z5SB4	Sericulture	Local, National, Regional and Global	To motivate young minds to become an entrepreneur for practicing sericulture as cottage industry.	<p>CO 1 List the importance of sericulture as cottage industry and the support provided by Central Silk Board.</p> <p>CO 2 Explain the different methods of vegetative propagation followed in mulberry cultivation.</p> <p>CO 3 Outline the life cycle of mulberry silkworm and the methods of rearing.</p> <p>CO 4 Organize the steps involved in processing of silk and its marketing.</p> <p>CO 5 Find various diseases that affect silkworm and cocoon formation</p>

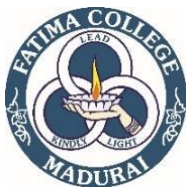


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19Z6CC1 7	Basic Immunology	Global &National	To understand the immune system and immune response involved in human body. To help students develop the skills necessary for the critical analysis of contemporar y on topics related to health and disease.	CO 1Outline the types of immunity, immunization and origin of immune cells CO 2Explain the structure and properties of antigen and antibody CO 3Identify the antigen and antibody interactions and the steps involved in the immunological techniques CO 4Illustrate the types and mechanism of immune response and events in hybridoma technology CO 5Describe the types of hypersensitivity reactions and autoimmune diseases
19Z6CC1 8	Principles of Biotechnolog y	Global &National	To familiarize the use of the techniques	CO 1Identify the principles and applications of Biotechnology biosafety guidelines and IPR for the benefit of mankind

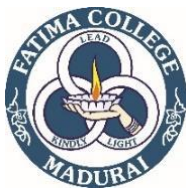


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			<p>of engineering and technology in Biology for the study of living organisms, to modify products or processes for specific use. Also, to find solution of problems concerning human activities including agriculture, medical treatment, industry and environment</p>	<p>CO 2 Discuss the tools and Techniques to manipulate DNA using rDNA technology for the development of transgenic plants, animals, and microbes or products for specific use</p> <p>CO 3 Describe basic techniques in animal cell culture and the application of stem cell production.</p> <p>CO 4 Summarize the biotechnology products and applications in the healthcare products, medicine, agriculture</p> <p>CO 5 Analyse the appropriate technology and application of biotechnology in industry and environmental sectors to increase SCP production and sewage management.</p>
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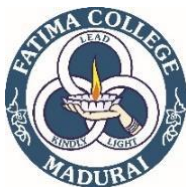


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19Z6CC1 9	Lab- Immunology	Local, National, Regional and Global	The overall objective of this course is to provide the undergraduate students of Zoology an experience of exploring immunological principles through experimentation and to introduce the procedures, basic techniques and instruments used in the clinical	CO 1 Relate the knowledge of basic principles of immunology to carry out the related experiments CO 2 Acquire skills in handling basic equipments CO 3 Infer the outcome of the experiments of Immunology CO 4 Relate the biochemical properties of Glucose, Albumin & Ketone bodies while performing the qualitative analytical tests for their detection in urine sample CO 5 Develop familiarity with the principles of Laboratory safety
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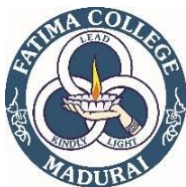
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			laboratories.	
19Z6CC20	Lab-Biotechnology	Local, National, Regional and Global	Students gain hands-on experience and learn the theoretical basis of lab techniques common to a variety of biological disciplines such as biotechnology, Bioinformatics and Entomology experiments.	<p>CO 1 Acquire skills in handling basic equipments</p> <p>CO 2 Identify the insects</p> <p>CO 3 Estimate the various biomolecules using standard protocols</p> <p>CO 4 Identify and comment on the spotters Agarose gel electrophoresis, SDS-PAGE, pBR322, Spirulina and Insulin and Bioinformatics tools</p> <p>CO 5 Examine the features in mouth parts of Cockroach & Honey bee, Pests of Agricultural Importance – Rice Weevil, Rhinoceros Beetle</p>
19Z6ME3	Embryology	Global & National	This course imparts knowledge on the	CO 1 Recall the basic concepts of developmental biology.



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			development al process of egg to the formation of organism.	CO 2 Tell how fertilization, cleavage and gastrulating occur. CO 3 Compare the basic concepts of organogenesis in different organisms. CO 4 Relate the development of egg into a foetus, then into adult, among Vertebrates. CO 5 Associate the embryo development with Phylogeny.
19Z6ME4	Clinical Laboratory Technique	Local, National, Regional and Global	Job oriented course provides current knowledge and upgraded skills in clinical laboratory techniques on the	CO 1 List the different sterilization methods followed in clinical laboratory. CO 2 Explain the collection method and techniques used in laboratory for urine analysis. CO 3 Outline the method of blood collection and related analysis.

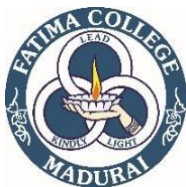


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			methods of testing the clinical samples	CO 4 Find the way to process clinical specimens safely according to established procedures. CO 5 Utilize the knowledge of karyotyping in detection of congenital malformations.
19Z6ME5	Bioinformatics	Global & National	To enable the students to appreciate the significance of computational programs in the development and analysis of biological database	CO 1 Enumerate the applications of bioinformatics, web browsers and search engines and biological databases CO 2 Describe the flat file of UniProtKB, secondary and tertiary structure prediction CO 3 Employ the appropriate substitution matrices and global and local alignment and BLAST CO 4 Summarize the methods of multiple sequence alignment and phylogenetic tree

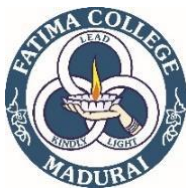


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				CO5 Compute and develop Ramachandran plot and protein structure prediction
19Z6ME6	Entomology	Local, National, Regional and Global	To learn about the classification, biology and control of insects and to appreciate the importance of insects	CO 1 List the different methods of insect collection. CO 2 Find the morphological modifications of insects with different functions. CO 3 Summarize the beneficial aspects of insects. Lect CO 4 Explain the harmful effects of insects. CO 5 Identify the agricultural pests and the economic damage caused.
19Z6SB5	Apiculture	Local, National, Regional and Global	To enable the students to be familiarized with Bee keeping techniques and to	CO 1 Explain the scope of apiculture in India CO 2 Recall the structure of honey bee CO 3 List the equipments used in bee keeping



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			motivate them to become entrepreneur	CO 4 Explain the extraction, Preservation and storage of honey CO 5 Outline the types of bee diseases
19Z6SB6	Dairy Farming	Local, National, Regional and Global	To enable the students to be familiarized with management of high yielding cow species, preparation of value-added products using milk and to motivate them to become an entrepreneur	CO 1 Identify the features of various indigenous and exotic breeds of dairy cattles. CO 2 Discuss the management of new born calf, Heifer and milk cow. CO 3 Summarize the significance of Pasteurization in the preservation of the nutritive value of milk. CO 4 Develop an idea regarding the formulation of value added dairy products. CO 5 Describe the clinical findings, treatment and control measures of livestock diseases.



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