Sree Narayana Mangalam College Maliankara

(Affiliated to Mahatma Gandhi University, Kottayam)

PROGRAMME OUTCOME

PROGRAMME SPECIFIC OUTCOME, COURSE OUTCOME

B.Sc ZOOLOGY

Sree Narayana Mangalam College
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At the end of the Under Graduate Program at S.N.M College, Maliankara, a student will have developed:

UG PROGRAMME OUTCOMES

PO1:	Problem solving and critical thinking: Critical thinking skills help the students understand and assess a situation based on all the facts and information available. With the help of critical thinking skills, students can sort and organise information, data and facts to define and solve a problem. This program outcome can ensure that the students receive ample opportunities to work on these skills by providing them with pragmatic modes of learning in their respective subjects.
PO2:	**Global Perspective and social interaction:**This program outcome ensure that the students attain an ability to respect the viewpoints of those from diverse cultures, races, ages, genders, religions and lifestyles to build collaborative relationships and communicate effectively. The ability to appreciate, value, and learn from other cultures and perspectives. It also suggests in recognising instance of unhealthy influences around them and the relying on inspirations of growth and stability.
PO3:	**Ethics:** This program outcome helps in adhering to basic ethical values combined with strong subject awareness that promises in creating a complete package of genuine result guaranteeing individuals. To be ethical means that you respect, care and love hard work and consider it a valuable quality. Ethics in work place means dependable, productive, collaborative, and passionate.
PO4:	**Environment and Sustainability:** This program outcome makes students aware of, sensitive to, and knowledgeable about the environment and its interconnectedness to social and economic systems, while encouraging them to develop attitudes of concern and motivation, as well as practical, complex systems and critical thinking skills to identify and solve environmental problems. An individual can be called educated when he/she recognises and shows respects to other forms of living things.

PO5:	**Effective Citizenship:** This program outcome develops the student's capacity to feel socially responsible to her community and to take corresponding action to support its assets and to deal with its concerns. It also develops ability to demonstrate empathetic social concern and equity-based national development.
PO6:	**EffectiveCommunication:**This program outcome create ability to communicate effectively and possess scientific temper and modern outlook of the world. Ability to speak, reading, writing and listening carefully are the three most important communication skills to be developed by every individual for their life journey.
PO7:	**Life-long learning:** Engage in life-long learning to acclimatize themselves in an ever-changing world. We need to continually keep our skills sharp and up to date so that we have an edge in all we do.

PROGRAMME SPECIFIC OUTCOMES

At the end of B.Sc Zoology at S.N.M College, Maliankara, a student will have developed:

PSO1	Acquire basic knowledge of various disciplines of Zoology and General Biology meant both for a graduate terminal course and for higher studies**.**
PSO2	Inculcate interest in nature and love of nature.
PSO3:	Understand the rich diversity of organisms and their ecological and evolutionary significance.
PSO4:	Imbibe basic skills in the observation and study of nature, biological techniques, experimental skills and scientific investigation..
PSO5:	Create awareness on the internal harmony of different body systems and the need for maintaining good health through appropriate lifestyle.
PSO6:	Impart awareness of the conservation of the biosphere

COURSE OUTCOMES

Semester I - ZY1CRT01 GENERAL PERSPECTIVES IN SCIENCE & PROTISTAN DIVERSITY

At the end of this course, a student will have developed ability to:

CO1:	To create an awareness on the basic philosophy of science, concepts and scope.
CO2:	To understand different levls of biological diversity through the systematic classification
CO3:	To familiarize taxa level identification of animals
CO4:	To make interest in Protistan diversity
CO5:	To impart knowledge on parasitic forms of lower invertebrates

Semester II - ZY2CRT02 ANIMAL DIVERSITY - NON CHORDATA

At the end of this course, a student will have developed ability to:

CO1:	To create appreciation on diversity of life on earth.
CO2:	To understand different levels of biological diversity through the systematic classification of invertebrate fauna.
CO3:	To familiarize taxa levels identification of animals.
CO4:	To understand the evolutionary significance of invertebrate fauna.
CO5:	To instill curiosity on invertebrates around us.
CO6:	To impart knowledge on parasitic forms of lower invertebrates.

PRACTICAL I - ZY2CRP01 GENERAL PERSPECTIVES IN SCIENCE, PROTISTAN DIVERSITY BIODIVERSITY & ANIMAL DIVERSITY – NON CHORDATA

At the end of this course, a student will have developed ability to:

CO1:	Make interest in Protistan diversity.
CO2:	Create appreciation of diversity of life on earth
CO3:	To familiarize taxa levels identification of animals.
CO4:	To understand the evolutionary significance of invertebrate fauna.

SEMESTER III – ZY3CRT03 ANIMAL DIVERSITY CHORDATA

At the end of this course, a student will have developed ability to:

CO1:	To acquire in depth knowledge on the diversity of chordates and their systematic position**.**
CO2:	To make them aware of the economic importance of some classes.
CO3:	To understand the evolutionary importance of selected chordate groups.
CO4:	Make interest in Chordate Diversity

SEMESTER IV - ZY4CRT04 RESEARCH METHODOLOGY, BIOPHYSICS AND BIOSTATISTICS

At the end of this course, a student will have developed ability to:

CO1:	To familiarise the learner the basic concept of scientific method in research process.
CO2:	To have knowledge on various research designs.
CO3:	To develop skill in research communication and scientific documentation.
CO4:	To create awareness about the laws and ethical values in biology.
CO5:	To equip the students with the basic techniques of animal rearing collection and preservation.
CO6:	To help the student to apply statistical methods in biological studies.

PRACTICAL II - ZY4CRP02 ANIMAL DIVERSITY – CHORDATA, RESEARCH METHODOLOGY, BIOPHYSICS & BIOSTATISTICS

At the end of this course, a student will have developed ability to:

CO1:	Acquire in depth knowledge on the diversity of chordates and their systematic position.
CO2:	To have knowledge on various research designs.
CO3:	To equip the students with the basic techniques of animal rearing, collection and preservation.

CO4:	Help the student to apply statistical methods in biological studies.

Semester V

ZY5CRT05 ENVIRONMENTAL BIOLOGY AND HUMAN RIGHTS

At the end of this course, a student will have developed ability to:

CO1:	To install the basic concepts of Environmental Science, Ecosystems, Natural Resources, Population, Environment and Society.
CO2:	To make the students aware of natural resources, protection, conservation, the factors of polluting the environment, their impacts and control measures.
CO3:	To teach the basic concepts of toxicology, their impact on human health and remedial measures.
CO4:	To create a consciousness regarding Biodiversity, environmental issues & conservation strategies.
CO5:	To develop the real sense of Human rights- its concepts & manifestations

ZY5CRT06 CELL BIOLOGY AND GENETICS

At the end of this course, a student will have developed ability to:

CO1:	To understand the structure and function of the cell as the fundamentals for understanding the functioning of all living organisms.
CO2:	To make aware of different cell organelles, their structure and role in living organisms.
CO3:	To develop critical thinking, skill and research aptitudes in basic and applied biology.
CO4:	To emphasize the central role of genes and their inheritance in the life of all organisms.

ZY5CRT07 EVOLUTION, ETHOLOGY & ZOOGEOGRAPHY

At the end of this course, a student will have developed ability to:

CO1:	To acquire knowledge about the evolutionary history of earth- living and nonliving.
CO2:	To acquire basic understanding about evolutionary concepts and theories.

CO3:	To study the distribution of animals on earth, its pattern, evolution and causative factors.
CO4:	To impart basic knowledge on animal behavioural patterns and their role.
CO5:	To understand the medical implications of developmental biology

ZY5CRT08 HUMAN PHYSIOLOGY, BIOCHEMISTRY, AND ENDOCRINOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To acquire a deep knowledge in biochemistry, physiology and endocrinology
CO2:	To understand the hormonal regulation of physiological process in invertebrates and vertebrates.
CO3:	To familiarise with hormonal regulation of physiological systems in several invertebrate and vertebrate systems.
CO4:	The achievement of above objectives along with periodic class discussions of current events in science, will benefit students in their further studies in the biological/physiological sciences and health-related fields, and will contribute to the critical societal goal of a scientifically literate citizenry.

ZY5OPT01 - VOCATIONAL ZOOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To acquire basic knowledge and skills in aquarium management, Quail farming, vermicomposting and apiculture for self - employment**.**
CO2:	To learn the different resources available and to develop an attitude towards sustainability.
CO3:	Give awareness to society about need for waste management and organic farming.
CO4:	Provide scientific knowledge of profitable farming

Semester VI

ZY6CRT09 DEVELOPMENTAL BIOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To introduce the concepts and process in developmental biology
CO2:	To help students understand and appreciate the genetic mechanisms and the unfolding of the same during development
CO3:	To expose the learner to the new developments in embryology and its relevance to Man
CO4:	To attain a basic conceptual knowledge about the principle cellular mechanisms of development.
CO5:	To understand the medical implications of developmental biology
CO6:	To introduce the concepts and process in developmental biology

ZY6CRT10 MICROBIOLOGY AND IMMUNOLOGY

At the end of this course, a student will have developed ability to:

CO1:	Acquire knowledge in classification of microorganisms
CO2:	To motivate the learner to refresh and delve into the basics of cell biology
CO3:	To provide an intensive and in-depth knowledge to the students in immunology
CO4:	To help the learner to understand the role of immunology in human health and well-being
CO5:	To give an dea about Antigen –Antibody Interactions

ZY6CRT11 BIOTECHNOLOGY, BIOINFORMATICS AND MOLECULAR BIOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To Acquire knowledge in tools and technology in biotechnology
CO2:	To Familiarise the role of bioinformatics in lifescience
CO3:	To provide students with a deep knowledge in biotechnology, bioinformatics & molecular biology

CO4:	To familiarise students with bioinformatics which will provide a basic understanding that can be used for further study and research

ZY6CRT12 OCCUPATIONAL ZOOLOGY (APICULTURE, VERMICULTURE, QUAIL FARMING & AQUACULTURE)

At the end of this course, a student will have developed ability to:

CO1:	To equip the students with self employment capabilities.
CO2:	To provide scientific knowledge of profitable farming.
CO3:	To make the students aware of cottage industries.
CO4:	To learn the different resources available and to develop an attitude towards sustainability.

ZY6CBT04 -NUTRITION, HEALTH AND LIFESTYLE MANAGEMENT

At the end of this course, a student will have developed ability to:

CO1:	Provide students with a general concept of health and the parameters that define health and wellness
CO2:	To understand principles of nutrition and its role in health.
CO3:	To familiarize the students regarding food safety, food laws & regulations
CO4:	To provide knowledge and understanding regarding life style diseases

PRACTICAL III -ZY6CRP03 ENVIRONMENTAL BIOLOGY, TOXICOLOGY, CELL BIOLOGY & GENETICS

At the end of this course, a student will have developed ability to:

CO1:	To describe the fine structure and functions of cell organelles.
CO2:	To perform a variety of molecular and cellular biology techniques.
CO3:	Instill the basic concepts of Environmental Sciences, Ecosystems, Natural Resources, Population, Environment and Society.
CO4:	Develop the real sense of Human rights – its concepts & manifestations

PRACTICAL IV- ZY6CRP04 EVOLUTION, ETHOLOGY, ZOOGEOGRAPHY, HUMAN PHYSIOLOGY, BIOCHEMISTRY & ENDOCRINOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To acquire knowledge about the evolutionary history of earth - living and nonliving.
CO2:	To study the distribution of animals on earth, its pattern, evolution and causative factors. Impart basic knowledge on animal behavioural patterns and their role
CO3:	To provide students with a deep knowledge in biochemistry, physiology and endocrinology
CO4:	Defining and explaining the basic principles of biochemistry useful for biological studies for illustrating different kinds of food, their structure, function and metabolism

PRACTCAL V ZY6CRP05 DEVELOPMENTAL BIOLOGY, MICROBIOLOGY & IMMUNOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To achieve a basic understanding of the experimental methods and designs that can be used for future studies and research.
CO2:	To provide the students with the periodic class discussions of current events in science which will benefit them in their future studies in the biological/physiological sciences and health-related fields
CO3:	To inculcate a general awareness regarding the role of micro-organisms in maintaining health.
CO4:	To provide a basic understanding of the experimental methods and designs used in microbiology

PRACTICAL VI - ZY6CRP06 BIOTECHNOLOGY, BIOINFORMATICS, MOLECULAR BIOLOGY & OCCUPATIONAL ZOOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To provide an understanding about the latest techniques in molecular biology and bioinformatics
CO2:	To emphasize the role of computers in the study of modern biology.
CO3:	To provide scientific knowledge regarding various economically important culturable species
CO4:	To equip the students with self employment capabilities

Complementary Course

Semester I

ZY1CMT01 NON CHORDATE DIVERSITY

At the end of this course, a student will have developed ability to:

CO1:	To study the scientific classification of invertebrate fauna.
CO2:	To learn the physiological and anatomical peculiarities of some invertebrate phyla through type study.
CO3:	To learn the unity of life with rich diversity of organisms & evolutionary significance of certain invertebrate fauna.
CO4:	To stimulate the curiosity of students in the biota living around them.

Semester II

ZY2CMTO2 CHORDATE DIVERSITY

At the end of this course, a student will have developed ability to:

CO1:	To make the student observe the diversity in chordates and their systematic position.
CO2:	To make aware of the economic importance of chordates.
CO3:	To learn the physiological and anatomical peculiarities of some vertebrate species through type study.
CO4:	To stimulate the students curiosity in vertebrates living associated with them.

Semester III

ZY3CMT03 PHYSIOLOGY AND IMMUNOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To appreciate the correlation between structure and function of organisms.
CO2:	To make the student aware of the health related problems, their origin and treatment.
CO3:	To understand how efficiently our immune system work in our body.
CO4:	To acquire knowledge about preventing common diseases rather than curing.

Semester IV

ZY4CMT04 APPLIED ZOOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To acquire basic knowledge and skills in applied branches of zoology.
CO2:	To understand the technology for utilising eco friendly organisms around them for beneficial purpose.
CO3:	To equip the students for self employment opportunities with scientific knowledge to perform prifitably & confidently.
CO4:	Give awareness to society about need for waste management and organic farming.

PRACTICAL I - ZY2CMP01 NON CHORDATE DIVERSITY & CHORDATE DIVERSITY

At the end of this course, a student will have developed ability to:

CO1:	To familiarize taxa levels identification of animals.
CO2:	To understand the evolutionary significance of invertebrate fauna.
CO3:	To acquire in depth knowledge on the diversity of chordates and their systematic position.
CO4:	Make interest in Chordate Diversity

PRACTICAL II - ZYCMP04 PHYSIOLOGY, IMMUNOLOGY & APPLIED ZOOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To provide students with a deep knowledge in physiology
CO2:	To acquire basic knowledge in immunology
CO3:	To provide scientific knowledge regarding various economically important culturable species
CO4:	To equip the students with self employment capabilities