

E.M.G. YADAVA WOMEN'S COLLEGE , MADURAI – 625 014.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)

Re-accredited (**3rd Cycle**) with Grade **A⁺** & **CGPA 3.51** by NAAC

DEPARTMENT OF ZOOLOGY



CBCS SYLLABUS

BACHELOR OF SCIENCE

PROGRAMME CODE - Z

COURSE STRUCTURE

(w.e.f. 2021 – 2022 Batch onwards)



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CRITERION - I

1.2.2 Details of Programmes offered through Choice Based Credit System (CBCS) / Elective Course System

**Syllabus copies with highlights of contents focusing on
Elective Course System**



To be Noted:

HIGHLIGHTED	COURSE
	Elective

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(w.e.f. 2021 – 2022 onwards)

COURSE STRUCTURE – SEMESTER WISE

Semester	Part	Sub Code	Title of the paper	Teaching hrs (per week)	Exam Duration (hrs)	Marks Allotted			Credits
						CIA	SE	Total	
V	III	21Z51	Core : Genetics	4	3	25	75	100	4
	III		Elective - I	4	3	25	75	100	4
	III		Elective - II	4	3	25	75	100	4
	III		Core : Lab in Genetics, Ecology & Evolution and Biochemistry.	4	-	-	-	-	-
	III		Core : Lab in Physiology Microbiology & Immunology and Biotechnology	4	-	-	-	-	-
	IV	21SEZ51	SBE: Biostatistics	2	3	25	75	100	2
	IV	214EV5	Environmental Studies	2	3	25	75	100	2
	III	21AG5	Allied II : Taxonomy of Angiosperms, & Plant Pathology	4	3	25	75	100	4
	III		Allied Lab II : Taxonomy of Angiosperms, & Plant Pathology and Applied Botany	2	-	-	-	-	-
	III	21Z61	Core : Physiology	4	3	25	75	100	4
	III	21Z62	Core : Microbiology & Immunology	4	3	25	75	100	4
	III		Elective – III	4	3	25	75	100	4
	III	21Z61P	Core : Lab in Biochemistry, Genetics, Ecology & Evolution	4	3	40	60	100	7
	III	21Z62P	Core : Lab in Physiology Microbiology & Immunology and Biotechnology	4	3	40	60	100	8

VI	IV	21SEZ61	SBE: Economic Zoology	2	3	25	75	100	2
	III	21AG6	Allied II : Applied Botany	4	3	25	75	100	4
	III	21AG6P	Allied Lab II : Taxonomy of Angiosperms, & Plant Pathology and Applied Botany	2	3	40	60	100	1
	IV	214VE6	Value Education	2	3	25	75	100	2
	V	215NS4/2 15PE4	Extension Activities NSS/Physical Education	-	3	25	75	100	1

Electives :**Semester - V****Elective – I & II – (Choose any two)**

1. Ecology & Evolution - **21ZE5A**
2. Biochemistry - **21ZE5B**
3. Fisheries Biology - **21ZE5C**

Semester- VI**Elective - III – (Choose any one)**

1. Biotechnology - **21ZE6A**
2. Poultry science - **21ZE6B**

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Elective - I

Title of the Paper : Ecology & Evolution

Semester : V

Contact hours: 4

Sub Code : 21ZE5A

Credits : 4

Objectives:

- Learn interdependence between people and nature that is vital for food production.
- Able to solve biological problems that impact our lives.
- Gain knowledge on the connections that exist between different species.

Unit – I Introduction to Ecology: Subdivisions of ecology – Autecology and Synecology, Ecosystem : - structure and types, Dynamics of Ecosystem – Food chain, Food web and Ecological pyramids , Concepts of Ecosystem -Limiting factors – Concepts of limiting factors- Light as a limiting factor – Pigmentation, Reproduction, Colour changes, Vision, Locomotion and Lunar Rhythm. Temperature as a limiting factor- Eurythermal and Stenothermal, Metabolism and reaction rate, Reproduction and Morphology.

Unit – II Habitat Ecology: Terrestrial habitat- Grass land ecosystem, Aquatic Habitat – Ecosystems (Lotic and lentic), Marine habitat : Characteristics, stratification, deep sea adaptations.

Unit – III Community Ecology: Characteristics of Community Ecology- structure, stratification, Ecotone and edge effect, Ecological niche, concepts of community and ecological succession-process of succession, climax, types, patterns and significance of succession.

Unit – IV Evidences of Evolution : Origin of life – Abiogenesis, Biogenesis, Cosmic theory, Biochemical origin of life – Urey –Miller experiment. Morphological and comparative anatomy- Homology & Analogy (example-forelimbs), Vestigial organs-

(Vermiform appendix, Plica semilunaris), Embryological evidences – developmental stages, Theories of evolution- Lamarkism, Neo-Darwinism - Mimicry - Batesian and Mullerian Mimicry.

Unit- V Hardy Weinberg – Gene pool, gene frequency and genetic drift, Factors affecting gene equilibrium- Natural selection - Isolating mechanisms- Speciation – Allopatric & Sympatric speciation - Human evolution - Cultural Evolution.

Text Book :

1.Arumugam ,N., *Concepts of Ecology* , Saras Publication, Kottar, Nagarkovil 2010.

Reference Books :

- 1.Dash, M.C., *Fundamentals of Ecology*, Tata Mc.Graw Hill Publishing Co.Ltd., New Delhi . ISBN: O – 07 -460103 – 2. 1996.
- 2.Gnanamuthu, C.P. *Introduction to Animal Ecology* – Higginbothams, Mount road, Chennai .1901
- 3.Kumar H.D., *Modern Concepts of zoology*, Vikas publishing House(P)Ltd. New Delhi.1995
- 4.Sambasivaya, Kamalakara Rao,& Augustine Chellapa-*Animal Ecology* S.Chand & Co.,Ram Nagar New Delhi 110055.1985
- 5.Odum, E.P. *Basic Ecology*, Saunders College Publishing, New York.1971
- 6.Odum, E.P. *Fundamentals of Ecology*, Saunders Toppan, London.1983

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Elective- II

Title of the Paper : Biochemistry

Semester : V

Contact hours : 4

Sub Code : 21ZE5B

Credits : 4

Objectives:

- Broadens our understanding of biochemical changes relating to physiological alteration in human body.
- Understand the chemical aspects of biological processes such as digestion, hormonal action and muscle contraction –relaxation.
- Application of skills in answering, critically analyzing, interpreting and presenting the results of laboratory investigations.

Unit - I Carbohydrates: classification and biological importance - carbohydrate metabolism – Glycogenesis, Glycolysis, Citric acid cycle and Hexose Monophosphate Shunt.

Unit - II Amino acid structure and classification, Protein – Structure, classification, Configuration of protein – Primary, Secondary, Tertiary and Quaternary, and biological importance -Transamination, Decarboxylation, Transdeamination, Transmethylation, Urea cycle. Ramachandran Plot.

Unit - III Lipids: Classification and structure of cholesterol- β -oxidation of fatty acids - Biological importance of lipids–biosynthesis of fatty acids.

Unit - IV Enzymes: classification, physico-chemical nature and mechanism of enzyme action, factors affecting enzyme activity - Applications of enzymes and coenzymes.

Unit-V Bio-chemical techniques, Principle and biological application of Paper chromatography and Poly Acrylamide Gel Electrophoresis, pH meter, Spectrophotometry

Textbook:

Satyanarayana. U and Chakrapani .U *Biochemistry*, 5th Edition, Elsevier Health Sciences, India.2020. ISBN: 9788131248850

Reference Books:

1. Lehninger, Nelson& Cox , *Principles of Biochemistry*, CBS Publishers & Distributers, Delhi, CBS ISBN 81-239-0295-6 , 2004.
2. Lubert stryer, *Biochemistry* ,W.H.Freeman and company, New York.2015
3. Power.C.B & Chatwal G.R , *Biochemistry* , 5th edition ,Himalaya Publishing House.2017
4. Robert,K. Murray Daryl.K. Granner. Harper's *Biochemistry*, Peter A. Mayes & Victor W.Rodwell pRetice –Hall International.1988

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Elective - III**Title of the Paper : Biotechnology****Semester : VI****Contact hours : 4****Sub.Code : 21ZE6A****Credits : 4****Objectives :**

- Understand the principles of animal culture, media preparation, Invitro fertilization and embryo transfer technology.
- Aware of the applications of recombinant DNA technology in agriculture and production of therapeutic proteins.
- Knowledge of the microbial degradation of Pesticides, Bioremediation & Biofertilizers.

Unit –I Introduction & Recombinant DNA Technology –History and Scope of biotechnology, Conventional vs Modern Biotechnology. Biotechnology tree-Tools of gene cloning: Restriction Endonucleases , Linkers & adapters – vectors (E.coli) Major steps in gene cloning- Cloning of human insulin gene.

Unit – II Industrial Biotechnology: Microbial products – Production of Cyanocobalamine (Primary) and Penicillin (Secondary) - Bio Gas Production - stages of methanogenesis – uses. Industrial production and application of ethanol (green fuel)

Unit- III Environmental Biotechnology - Biopesticides – biological control of crop pest (bacterial pesticides only) – plant extracts – bt toxin production. Bioremediation of Heavy metals (e.g super bug), Bioleaching and Xenobiotics.

Unit- IV Animal Biotechnology - Animal tissue culture – Basic requirements – Culture media and its composition – Transgenesis – Transgenic Fish and Cattle - Monoclonal Antibody (Mab) - production & its application.

Unit – V Applied Biotechnology : r-DNA Proteins and their uses – Interferon, Interleukin -2, Factor VII , Urokinase , TPA , FMD Vaccine in Cattle.

Text Book:

Kumaresan V. *Book of Biotechnology*, Saras Publications, 2012.

Reference Books:

1. Alcamo. LD ., *DNA Technology – The Awesome Skill*. WCB Dubuque IA. ISBN 0-697.- 21248-3 , 1996.
2. Dharmalingam. K., *Biotechnology: principles, Practices and Prospects*, Biology Education. 7(3): 152-156. ISBN 0970-5961.1990.
3. Dubey. R.C.,-*Text Book Biotechnology*. S.Chand & Co.Ltd. 2004.
4. Gupta. P.K., *Elements of Biotechnology*, Rastogi publication, Meerut, ISBN 81-7133-412-1 Nuzhat Ahmed, Fouad M. Qureshi Obaid Y.Khan1999.
5. Nuzhat Ahmed, et al. *Industrial and Environmental Biotechnology*,2004.
6. Singh,B.D., *Biotechnology*, Kalyani publishers, New Delhi, ISBN 81 - 7096-735. 1998.