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. 2017 – 2018 onwards)

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

Annexure - 5

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
(Re –accredited (3rd Cycle) with Grade A+ and CGPA 3.51 by NAAC)

CBCS
DEPARTMENT OF ZOOLOGY
COURSE STRUCTURE

(w.e.f. 2017 – 2018 Batch onwards)

S.No	Part	Sub Code	Title of the paper	Teaching hrs. (per week)	Duration of Exam (hrs.)	Marks allotted			Credits
						C · A	S.E	Total	
1	I	171T1	Tamil	6	3	25	75	100	3
	II	172E1	English	6	3	25	75	100	3
	III	**17Z11**	**Core – Invertebrata**	4	3	25	75	100	4
	III	**17Z1P**	**Core Lab - in – Inveretebrata**	2	-	-	-	-	-
	IV	**17SEZ11**	**Computer Application**	2	2	-	-	100	2
	IV	**17SEZ12**	**Aquaculture**	2	2	-	-	100	2
	IV	**17NMZ1**	**Medical microbiology**	2	2	-	-	100	2
	III	**17AK1**	Allied I - General Chemistry	4	3	25	75	100	4
	III	**17AK2P**	Allied I –Practical-1 Salt analysis	2	-	-	-	-	-
2	I	**171T2**	Tamil	6	3	25	75	100	3
	II	**172E2**	English	6	3	25	75	100	3
	III	**17Z21**	**Core – Chordata**	4	3	25	75	100	4
	III	**17Z2P**	**Core - Lab in Invertebrata & Chordata**	2	3	40	60	100	2
	IV	**17SEZ21**	**Vermi Technology**	2	2	-	-	100	2
	IV	**17SEZ22**	**Clinical microbiology**	2	2	-	-	100	2
	IV	**17NMZ2**	**Ornamental fish culture**	2	2	-	-	100	2
	III	**17AK2**	Allied I - General Chemistry-II	4	3	25	75	100	4

Annexure - 3

	III	**17AK2P**	Allied I –Practical-1 Salt analysis	2	3	40	60	100	1
3	I	**171T3**	Tamil	6	3	25	75	100	3
	II	**172E3**	English	6	3	25	75	100	3
	III	**17Z31**	**Core – Cell and Molecular Biology**	4	3	25	75	100	4
	III	**17Z3P**	Core - Lab in **Cell and Molecular Biology and Developmental Biology**	2	-	-	-	-	-
	III	17AK3	Allied I - General Chemistry -III	4	3	25	75	100	4
	III	**17AK4P**	Allied I –Practical-II Volumetric Analysis	2	-	-	-	-	-
	III	17AG3	Allied – II Botany Plant Diversity – Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms	4	3	25	75	100	4
	III	17AG4P	Plant Diversity - Algae, Fungi, and Bryophytes, Pteridophytes Gymnosperms	2	-	-	-	-	-
4	I	171T4	Tamil	6	3	25	75	100	3
	II	172E4	English	6	3	25	75	100	3
	III	**17Z41**	**Core – Developmental Biology**	4	3	25	75	100	4
	III	**17Z4P**	**Core - Lab in Cell and Molecular Biology and Developmental Biology**	2	3	40	60	100	2
	III	17AK4	Allied I - General Chemistry -IV	4	3	25	75	100	4
	III	17AK4P	Allied I - Practical-II Volumetric Analysis	2	3	40	60	100	1
	III	17AG4	Allied -II – Cell Biology, Plant Anatomy, Genetics, Plant Breeding & Horticulture	4	3	25	75	100	4

Annexure - 3

	III	17AG4P	Plant Diversity - Algae, Fungi, and Bryophytes, Pteridophytes Gymnosperms, Cell Biology, Plant Anatomy, Genetics, Plant Breeding & Horticulture	2	3	40	60	100	1
5	III	**17Z51**	**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	**17Z61P**	**Core - Lab in Genetics, Ecology & Evolution and Biochemistry**.	4	-	-	-	-	-
	III	**17Z62P**	**Core - Lab in Physiology Microbiology &Immunology and Biotechnology**	4	-	-	-	-	-
	IV	**17SEZ51**	**Biostatistics**	2	-	-	-	100	2
	IV	**174EV5**	Environmental Studies	2	-	-	-	100	2
	III	17AG5	Morphology, Taxonomy of Angiosperms, Medicinal Botany & Economic Botany	4	3	25	75	100	4
	III	17AG6P	Morphology, Taxonomy of Angiosperms, Medicinal Botany & Economic Botany	2	-	-	-	-	-
6	III	**17Z61**	**Core –Physiology**	4	3	25	75	100	4
	III	**17Z62**	**Core - Microbiology & Immunology**	4	3	25	75	100	4
	III		**Core Elective – III**	4	3	25	75	100	4
	III	**17Z61P**	**Core - Lab in Biochemistry, Genetics, Ecology & Evolution**	4	3	40	60	100	7 -
	III	**17Z62P**	**Core – Lab in Physiology Microbiology &Immunology and Biotechnology**	4	3	40	60	100	8

Annexure - 3

	IV	**17SEZ61**	**Economic Zoology**	2	2	-	-	100	2
	III	**17AG6**	Allied - II - Botany Plant Physiology, Embryology, Tissue culture and Plant Pathology.	4	3	25	75	100	4
	III	**17AG6P**	Morphology, Taxonomy of Angiosperms, Medicinal Botany & Economic Botany, Plant Physiology, Embryology, Tissue Culture & Plant Pathology	2	3	40	60	100	1
	IV	**174VE6**	Value Education	2	2	-	-	100	2
	Part – V **175NS4/175PE4**		Extension Activities NSS/Physical Education	-	2	-	-	100	1
	Total			180					140

Electives :

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

1. **Ecology& Evolution** - **17ZE5A** (Choosen Elective I)
2. **Biochemistry** - **17ZE5B** (Choosen Elective II)
3. Fisheries Biology - 17ZE5C

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

1. **Biotechnology** - **17ZE6A** (Choosen Elective III)
2. Poultry science - 17ZE6B

Annexure - 3

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
(Re –accredited (3rd Cycle) with Grade A+ and CGPA 3.51 by NAAC)

CBCS

DEPARTMENT OF ZOOLOGY

(w.e.f. 2017 – 2018 Batch onwards)

Title of the Paper	**: Ecology & Evolution**		
Semester	**: V**	**Contact hours:**	**4**
Sub Code	**: 17ZE5A**	**Credits**	**4**

Objective:

To make the students understand the ecosystems and behaviour of organism under various conditions.

Unit – I Ecosystem: Pond as an ecosystem - food chain and its types. Food web - ecological pyramids Light as a limiting factor – Effects of light on metabolism and reproduction. Temperature as a limiting factor .Effects of light on metabolism and morphology.

Unit – II Terrestrial habitat- grass land, fresh water & marine habitat : Characteristics, stratification, deep sea adaptations.

Unit – III Characteristics of Community Ecology. Ecotone and edge effect. Ecological niche, equivalence, ecotypes and ecological succession.

Unit – IV Evidences of Evolution : Brief account on morphological , comparative anatomy Embryological.physiological and Biochemical evidences. Homology & Analogy(example-forelimbs),Vestigial organ-(Vermiform appendix, Plica semilunaris), Fossil evidence –Archaeopteryx .Lamarkism , Darwinism,Neo-Darwinism - Mimicry - Batesian and Mullerian Mimicry.

Unit- V Hardy Weinberg law & its Significance- . Factors affecting gene equilibrium- Natural selection - Isolating mechanisms- Speciation – Allopatric & Sympatric speciation - Human evolution - Physical and cultural Evolution.

Annexure - 3

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* – Higginbothms, 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

Annexure - 3

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
(Re –accredited (3rd Cycle) with Grade A+ and CGPA 3.51 by NAAC)

CBCS

DEPARTMENT OF ZOOLOGY

(w.e.f. 2017– 2018 Batch onwards)
Elective- II

Title of the Paper	**: Biochemistry**		
Semester	**: V**	**Contact hours**	**: 4**
Sub Code	**: 17ZE5B**	**Credits**	**: 4**

Objective:

To familiarize the basic principles, and techniques of bio-chemistry.

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 and biological importance-Transamination , Decarboxylation, Transdeamination, Transmethylation, Urea cycle.

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

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

Unit-V Bio -chemical techniques, Principle and biological application of Paper chromatography and Electrophoresis (PAGE only), pH meter, Spectro photometry

Annexure -3

Textbook:

1. Satyanarayana.U *Bio - chemistry*, 5th Edition, Elsevier Health Sciences, India.2017.

Reference Books:

1. Ambiga Shanmugam, *Biochemistry,* 1996.
2. Lehninger, Nelson& Cox ,*Principles of Biochemistry,*CBS Publishers & Distributers,Delhi, CBS ISBN 81-239-0295-6 , 2004.
3. .Lubert stryer, *Biochemistry* ,W.H.Freeman and company,New York.2015
4. Power.C.B & Chatwal G.R , *Biochemistry* , 5th edition ,Himalaya Publishing House.2017
5. Robert,K.Murray Daryl.K.Granner. Harper's *Biochemistry,* PeterA.Mayes & Victor W.Rodwell pRetice –Hall International.1988

Annexure - 3

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
(Re –accredited (3rd Cycle) with Grade A+ and CGPA 3.51 by NAAC)

CBCS

DEPARTMENT OF ZOOLOGY

(w.e.f. 2017 – 2018 Batch onwards)
Elective – I & II (Optional)

Title of the Paper : Fisheries Biology
Semester : V **Contact hours : 4**
Sub Code : 17ZE5C **Credits : 4**

Objective:

To make the students understand the importance of fishes and its role in the economy of mankind.

Unit – I Introduction – Importance of fisheries – Economic value of common South Indian fishes – catla , Tilapia -Nutrition and feeding habits and feeding adaptations.- Native & Invasive fish species.

Unit – II Tagging of fishes.- Reproduction in fishes-Induced breeding - hypophysation Ecological factors influencing spawning in carps.

Unit – III Edible molluscan fisheries - Pearl fishery in India.Fisheries management – prawn fisherey , Constrains for fisheries -Sewage fed fisheries.

Unit – IV Marine Fisheries & Inland fisheries. Protozoan disease white spot disease-, worm disease -ligulosis, crustacean disease-argulosis and non parasitic disease-soft shell syndrome.

Unit – V Home Aquaria, Ornamental fishes – gold fish & black molly , By products of fishes-body oil , liver oil, fish glue, Isinglass & fish manure- Fish preservation and processing – Fish in relation to Public Health.

Annexure - 3

Text Book:

1. R. Santhanam **,** Fisheries Science, Daya Publishing House 2013

Reference Books:

1. Chandy,M. *Fishes*– National book trust, India 1970
2. Norman ,J.R.*A history of Fishes*– Earnest Benn Ltd, London.1975.
3. Marhall ,N.B.The life of Fishes– Weidnefeld & Nicholson, London.1965
4. S.R.Munro. ,*Marine and Fresh water fishes of Ceylon* ,2017.
5. Jhingran V.G. ,*Fish and Fisheries of India*– Hindustan Publishing Corp. Delhi.1991

Annexure - 3

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
(Re –accredited (3rd Cycle) with Grade A+ and CGPA 3.51 by NAAC)

CBCS

DEPARTMENT OF ZOOLOGY

(w.e.f. 2017 – 2018 Batch onwards)
Elective - III

Title of the Paper : Biotechnology
Semester : VI **Contact hours : 4**
Sub Code : 17ZE6A **Credits : 4**

Objective :

To educate the students about the basic knowledge, recent developments and applications of Biotechnology.

Unit –I Recombinant DNA Technology **-** Conventional vs Modern Biotechnology . Biotechnology tree-Tools of genecloning : Restriction Endonucleases , DNA ligase. Cloning vectors: Plasmid, cosmid, & expression vectors. Major steps in gene cloning-Cloning of human insulin gene.

Unit – II Industrial Biotechnology**:**Microbial products – Production of Cyanocobalamine (primary) and Pencillin (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 – biofertilizers – types – definition –phosphate solubilizers & nitrogen fixers – application – super bug – treatment of oil spills in marine environment.

Unit- IV Animal Biotechnology - Animal tissue culture – Basic requirements – Culture media and its composition – Transgenesis – Transgenic mice, Transgenic cattle – transgenic plants. Monoclonal Antibody (mAb) - production & its application.

Unit – V Applied Biotechnology : r-DNA Proteins and their uses – Interferon, IL-2,Factor VIII , Urokinase , TPA , FMD Vaccine in Cattle- Composting, Bioleaching and Bioremediation - Biosafety and Ethics . -GMO & constraints.

Text Book:

1. 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, Meeurt, ISBN 81-7133-412-1 Nuzhat Ahmed, Fouad M. Qureshi Obaid Y.Khan1999.
5. Nuzhat Ahmed, et al. *Industrial and Environmenal Biotechnology*,2004.
6. Singh,B.D., *Biotechnology,* Kalyani publishers, New Delhi, ISBN 81 - 7096-735. 1998.

Annexure - 3

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
(Re –accredited (3rd Cycle) with Grade A+ and CGPA 3.51 by NAAC)

CBCS

DEPARTMENT OF ZOOLOGY

(w.e.f. 2017 – 2018 Batch onwards)
(Elective III – Optional)

Title of the Paper	**: Poultry Science**		
Semester	**: VI**	**Contact hours**	**: 4**
Sub Code	**: 17ZE6B**	**Credits**	**: 2**

Objective:

To educate the students about the basic knowledge of poultry keeping and maintenance of chicks in a controlled conditions.

Unit –I Poultry industries in India-survey choosing the commercial layers and broilers. Poultry housing- deep litter system, cage rearing., feeders & waterers. Poultry manure Importance of egg .

Unit –II Chick rearing - management of chicks-management of layers-management of broilers. Lighting in poultry

Unit –III Summer management, winter management, debeaking, debeaking apparatus and its significance.

Unit –IV Feeding of chicks, growers and layers. symptoms of excess and deficiency of amino acids, vitamins and minerals, feed formulation and Non – Nutritive Feed additives.

Unit –V Poultry diseases- viral disease, bacterial disease, fungal disease and parasitic diseases .Vaccination programme.

Annexure - 3

Text Book:

1. Gnanamani ,M.R., *Modern aspects of commercial Poultry Keeping* , GIRI Publications, Madurai. 1988.

Reference Books :

1. Biester,H.E. and Schwarte., *Diseases of Poultry* , Oxford and IBH Publishing Company.1978
2. Naidu,P.M.N., *Poultry Keeping In India,* Indian Council of Agricultural Research, New Delhi.1973
3. Singh, R.A., *Poultry Production*, Kalyani Publishers, New Delhi.1981
4. Scott,M.L., *Nutrition of Chickens*. M. L. Scott & Assocates; Second Printing edition. 1971