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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DEPARTMENT OF ZOOLOGY –UG

(w.e.f. 2021 – 2022 onwards)

COURSE STRUCTURE – SEMESTER WISE

Sem	Part	Sub Code	Title of the paper	Teaching hrs (per week)	Exam Duration (hrs)	Marks Allotted			Credits
						CIA	SE	Total	
I	I	**211T1**	Part – I Tamil	6	3	25	75	100	3
	II	**212E1**	Part – II English	6	3	25	75	100	3
	III	**21Z11**	**Core :** Invertebrata	4	3	25	75	100	4
	III		**Core :** Lab in Inveretebrata & Chordata	2	-	-	-	-	-
	IV	**21SEZ11**	**SBE :**Computer Application	2	3	25	75	100	2
	IV	**21SEZ12**	**SBE :**Aquaculture	2	3	25	75	100	2
	IV	**21NMZ1**	**NME :**Medical microbiology	2	3	25	75	100	2
	III	**21AK1**	**Allied I :** General Chemistry -I	4	3	25	75	100	4
	III		**Allied I :** Practical-1 Inorganic qualitative analysis	2	-	-	-	-	-
II	I	**211T2**	Part – I Tamil	6	3	25	75	100	3
	II	**212E2**	Part – II English	6	3	25	75	100	3
	III	**21Z21**	**Core :** Chordata	4	3	25	75	100	4
	III	**21Z2P**	**Core :** Lab in Invertebrata & Chordata	2	3	40	60	100	2
	IV	**21SEZ21**	**SBE :** Vermi Technology	2	3	25	75	100	2
	IV	**21SEZ22**	**SBE :** Clinical Microbiology	2	3	25	75	100	2
	IV	**21NMZ2**	**NME:** Ornamental Fish Culture	2	3	25	75	100	2

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	III	**21AK2**	**Allied I :** General Chemistry-II	4	3	25	75	100	4
	III	**21AK2P**	**Allied I :** Practical-1 Inorganic qualitative analysis	2	3	40	60	100	1
III	I	**211T3**	Part – I Tamil	6	3	25	75	100	3
	II	**212E3**	Part – II English	6	3	25	75	100	3
	III	**21Z31**	**Core :** Cell and Molecular Biology	4	3	25	75	100	4
	III		**Core Lab :** Cell and Molecular Biology and Developmental Biology	2	-	-	-	-	-
	III	**21AK3**	**Allied I :** General Chemistry -III	4	3	25	75	100	4
	III		**Allied I :** Practical-II Volumetric Analysis	2	-	-	-	-	-
	III	**21AG3**	**Allied II :** Botany Plant diversity – Algae, fungi, Bryophytes, Pteridophytes and Gymnosperms	4	3	25	75	100	4
	III		Plant diversity - Algae, fungi, and Bryophytes, Pteridophytes Gymnosperms,	2	-	-	-	-	-
IV	I	**211T4**	Part – I Tamil	6	3	25	75	100	3
	II	**212E4**	Part – II English	6	3	25	75	100	3
	III	**21Z41**	**Core :** Developmental Biology	4	3	25	75	100	4
	III	**21Z4P**	**Core :** Lab in Cell and Molecular Biology and Developmental Biology	2	3	40	60	100	2
	III	**21AK4**	**Allied I :** General Chemistry -IV	4	3	25	75	100	4
	III	**21AK4P**	**Allied I :** Practical-II Volumetric Analysis	2	3	40	60	100	1
	III	**21AG4**	**Allied II :** Cell Biology ,Plant Anatomy,Genetics , Plant Breeding & Horticulture	4	3	25	75	100	4

Annexure - 5

	III	**21AG4P**	Plant diversity - Algae, fungi, and Bryophytes, Pteridophytes Gymnosperms, Cell Biology ,Plant Anatomy,Genetics , Plant Breeding & Horticulture	2	3	40	60	100	1
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	-	25	75	100	2
	IV	**214EV5**	Environmental Studies	2	-	25	75	100	2
	III	**21AG5**	**Allied II :** Morphology, Taxonomy of Angiosperms, Medicinal Botany & Economic Botany	4	3	25	75	100	4
	III		**Allied Lab II :** Morphology, Taxonomy of Angiosperms, Medicinal Botany & Economic Botany	2	-	-	-	-	-
VI	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
	IV	**21SEZ61**	**SBE:** Economic Zoology	2	3	25	75	100	2

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	III	**21AG6**	**Allied II :** Botany Plant Physiology, Embryology, Tissue culture and Plant Pathology.	4	3	25	75	100	4
	III	**21AG6P**	Morphology, Taxonomy of Angiosperms , Medicinal Botany & Economic Botany, Plant Physiology, Embryology, Tissue culture and Plant Pathology	2	3	40	60	100	1
	IV	**214VE6**	Value Education	2	3	25	75	100	2
	V	**215NS4/ 215PE4**	Extension Activities NSS/Physical Education	-	3	25	75	100	1
			Total	180					140

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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DEPARTMENT OF ZOOLOGY – UG

(w.e.f. 2021 – 2022 onwards)

Title of the Paper : Invertebrata
Semester : I **Contact hours: 4**
Sub Code : 21Z11 **Credits : 4**

Objectives:

1.To enable the students to understand the level of organization in invertebrate classifications.

2.To help the students gain practical applications in the biomedical and agronomy fields of research.

3.To make the learners aware of the human misconceptions, bioethics and phobias associated with invertebrate interactions.

UNIT- I Principles of taxonomy and Binomial nomenclature - classification.

PROTOZOA -General characters and classification of Protozoa up to class level with one example. Type study: *Paramecium caudatum* - External morphology – Nutrition - Cyclosis -Contractile vacuole - Conjugation only. General topics: 1. Protozoan parasites: Life Cycle – Symptoms - Diagnosis - Prevention and Treatment of 1. *Plasmodium vivax.* 2. *Entomoeba histolytica*. **PORIFERA**- General characters and classification of Porifera upto class level with one example. Type study: Sycon Sponge – Structure - Histology - Spicules - Gemmules and Parenchymula larva. General topic: Canal system in sponges.

UNIT- II **COELENTERATA**- General characters and classification of Coelenterata upto class level with one example. Type study: *Obelia* -Structure and Metagenesis

only.General topics:1. Polymorphism in Coelenterates 2. Corals and Coral reefs - Theories of reef formation.

UNIT- III HELMINTHES -General characters and classification of Helminthes upto class level with one example. Type study: *Fasciola hepatica* - External morphology –Excretory System - Reproductive system and Life history. General topics:1. Structure - Pathology - Control measures of *Ascaris lumbricoides* and *Wuchereria bancrofti.* 2. Parasitic adaptations of Helminthes. **ANNELIDA** -General characters and classification of Annelida upto class level with one example. Type study: *Megascolex mauritii* - External morphology - Setae - Nephridia - Nervous system - Reproductive system only. General topics:1. Metamerism in Annelida 2. Affinities of *Peripatus.*

UNIT-IV ARTHROPODA General characters and classification of Arthropoda upto class level with one example. Type study: Palaemon -External morphology - Appendages - Excretory system - Reproductive system and development.

General topics: Beneficial insects:- Honey bee, Lac insect and silkmoth

UNIT-V MOLLUSCA General characters and classification of Mollusca upto class level with one example. Type study*: Pila globosa* - External morphology - Digestive system - Nervous system, Respiratory system and Osphradium only.General topic: Sepia is an advanced mollusc. **ECHINODERMATA :**General characters and classification of Echinodermata upto class level with one example. Type study: *Asterias rubens* – External morphology - Pedicellaria –Water Vascular System - Reproductive System. General topic: Larval forms of Echinoderms and their phylogenetic significance .

Textbook:

1. Nair N.C, Leelavathy.S , Soundara Pandian.N Murugan.T and Arumugam.N., "*A text book of Invertebrata"* , Saras publication 2010 .
2. M. Ekambaranatha Ayyar & T. N. Ananthakrishnan *"A Manual of Zoology"* S. Viswanathan Pvt. Limited, 2012

Annexure - 5

Reference books:

1. Hyman L.H. "*The Invertebrate*". Vol. I-VI. 1955, McGraw Hill Co New York.
2. Barrington, E. J. W. *Invertebrate Structure and functions*. ELBS and Nelson 1979.
3. Jordon E.L. and Verma P.S "*Invertebrate Zoology"* S. Chand & Company Ltd, 2014.
4. Kotpal. R..L., "*Invertebrate Zoology"* 9th Edition Rastogi publication, 2005.

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DEPARTMENT OF ZOOLOGY – UG

(w.e.f. 2021 – 2022 onwards)

SKILL BASED ELECTIVE

Title of the Paper : Computer Application
Semester : I **Contact hours : 2**
Sub Code : 21SEZ11 **Credits : 2**

Objectives:

1. To enable the students to understand the basic operations of a computer system and computer application software.
2. To make students develop the skill of using computer applications software.
3. To help the students to gain basic computing skills.

UNIT-I Introduction to Computer - Block diagram- Characteristics of computer- Generations of computer - Hardware components of computer.

UNIT-II Computer and communication- types - needs - communication media- Network topologies.

UNIT-III MS Word-Word basic – Starting Word – Creating document - Key board operation – Mouse operation – Menu – File Menu – Editing Menu – Tool Bars and their icons – Drawing tool bar – Closing and opening the document.

UNIT-IV MS Excel – Selecting the cells – Entering the formulae – Entering data – Alignment – Format tool bar – Data menu – Inserting rows and columns.

UNIT-V MS. Powerpoint – View menu – Slide show – Tool menu – Create a new slide – Close presentation – Internet and its applications – E.mail and its advantages.

Annexure - 5

Text Books:

1. Arumugam. *N.,Computer application, Bioinformatics and Biostatistics*, Saras Publications. 2012.
2. Lakshmanan. R. and R. Rajamani and Shanmuganantham. M ., *Basics of Computer Science*, R.L.Publication,Madurai**.** 2009.

Reference Books:

1. Balaguruswamy. E., "*Fundamentals of Computers",* Mc Graw –Hill Education - Europe Publication.,2009.
2. Mittal C , *Fundamentals of Information Technology* ,Pragathi Prakasam, Meerut. 2003.
3. Rajaraman. V., *Fundamentals of computes*, fourth edition, Prentice Hall India Pvt.Ltd., 2008.
4. Vasanthi Ramanathan., "*Computer application,*" 1st Edition, Meenakshi Pathippagam., 2007.

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DEPARTMENT OF ZOOLOGY – UG

(w.e.f. 2021 – 2022 onwards)

SKILL BASED ELECTIVE

Title of the Paper : Aquaculture

Semester : I **Contact hours : 2**

Sub Code : 21SEZ12 **Credits : 2**

Objectives:

1. To produce protein rich ,nutritive ,palatable and easily digestible human food.
2. To produce ornamental fish for aesthetic appeal.
3. To make learners aware of the means of livelihood through commercial and industrial aquaculture.

UNIT – I Introduction -Need and scope of aquaculture- Aquaculture potentials of India - Inland Fishery resources- cultivable fishes.

UNIT – II Monoculture – poly culture- pen culture – cage culture – Raft culture – its problems – Integrated fish farming- paddy cum fish culture and salt cum shrimp culture.

UNIT - III Predators – control measures – Aquatic weeds and their control measures – Types of fishing nets – Marketing.

UNIT – IV Pearl oyster culture – pearl formation. Mass culture of live feed Artemia, Algae, Spirulina and Daphnia.

UNIT – V Prawn culture (fresh water) – hatchery stocking density – fresh water fish farming – selection of pond, construction, water quality management – conditioning the pond.

Annexure - 5

Text Books :

1. Arumugam ., "*Aquaculture*". , Saras Publication. 2012
2. Santhana Krishnan,G., "*Aquaculture"., J*.J Publications.1992.

Reference Books:

1. Bal.D.V and Rao K.V., "*Marine Fisheries" .,*Tata McGraw Hill Publishing Co- Ltd 1984.
2. Jhingran,V.G*., "Fish and Fisheries Of India"*., Hindustan.Publications 1982.
3. Marshall.N.B., "*The exploration in the Life history Of Fishes"*.,Harvard University Press., Cambridge,MA.1971.
4. Santhana Kumar.G and Selvaraj .A.M., "*Concept of Aquaculture"., *Meenam Publication .2005.

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DEPARTMENT OF ZOOLOGY – UG

(w.e.f. 2021 – 2022 onwards)

NON MAJOR ELECTIVE

Title of the Paper : Medical Microbiology
Semester : I **Contact hours : 2**
Sub Code : 21NMZ1 **Credits : 2**

Objectives:

1. To introduce basic principles and application relevance of clinical dieseases.
2. To make students know the etiological agents responsible for global infections and diseases.
3. To make students acquire and demonstrate competency in laboratory safety and skills applicable to microbiological research

UNIT- I Protozoan diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1. Malaria 2. Amoebiasis

UNIT-II Fungal diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1.Candidiasis 2.Mycetoma (Madurai Foot)

UNIT-III Bacterial diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis1. Tuberculosis (air-borne) 2. Syphilis (contagious)

UNIT-IV Viral diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1.Bird flu 2.Polio

UNIT-V Insect –borne diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1.Chikungunya 2. Dengue fever

Annexure - 5

Text Book:

1. Dubey R.C. & Maheswari D.K., "*A text Book of Microbiology*". S.Chand & Company Pvt, Ltd.2110.

Reference Books :

1. William Irving.et.al., "*Medical microbiology".* Taylor and Francis Group 2005.

2.Patrick Murray ,Ken Rosenthal &Michael Pfaller.," *Medical Microbiology*" 8th Edition, 2015.

3. Jawetz., Melnick & Adelbergs.,"Medical Microbiology"26th Edition,2010.

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DEPARTMENT OF ZOOLOGY – UG

(w.e.f. 2021 – 2022 onwards)

Title of the Paper	**: Chordata**		
Semester	**: II**	**Contact hours**	**: 4**
Sub Code	**: 21Z21**	**Credits**	**: 4**

Objectives:

1. To understand the origin and evolutionary relationship in different subphylum of chordates.
2. To understand the ecological role of different groups of chordates.
3. To make students learn and describe unique characters of urochordates, cephalochordates and fishes.

UNIT- I General characters (Diagnostic characters and additional characters) classification upto class level with one example. **Prochordates** General characters and classification of Prochordates upto class level with example. Type study: Prochordata – *Amphioxus lanceolatum* - External morphology- Digestion - Respiration. **General topics:** Retrogressive metamorphosis in Ascidians , Affinities of Hemichordata.

UNIT- II Agnatha: *Petromyzon*- External morphology ; Ammocoetes larva. - **Pisces-** Shark(*Scoliodon*) External Morphology- Lateral Line Sense organ - Urinogenital System **General topics:** Affinities of Petromyzon and Accessory respiratory organs in Fishes.

UNIT – III Amphibia: External features and biological significance of the following Examples: a. *Rana hexadactyla* , b. *Rana tigrina,* c. *Rana cyanophlyctis* - respiratory system (*Rana hexadactyla* only) **General Topics:**Parental care in Amphibia.

Reptilia : External morphology of *Calotes versicolor* only. Identification of poisonous and non- poisonous snakes of south india –poison apparatus- Biting mechanism venom and Anti venom - First aid for snake bite.

UNIT – IV Aves- External morphology of Pigeon (*Columba livia*) - structure and function of eye – respiratory system. **General Topics:** Flight adaptation in Birds, Migration in Birds.

UNIT – V Mammalia - External morphology of Rabbit (*Oryctolagus cuniculus*)- structure & function of heart, respiratory system only.**General Topics:** Dentition in mammals , monotremes (egg laying mammals).

Textbooks:

1. Nair N.C.*et.al*., "*A text book of Chordata"* Saras Publications. 2012.
2. Jordon, E.L & Verma, P.S. Chordate Zoology, S.Chand & Co., New Delhi. 2000.

Reference books:

1. Alexander R.M.C.N., "*The Chordata"* Cambridge University Press., New York, 1981
2. Kotpal. R.L., *"Modern Text Book of Zoology Vertebrates"* Rastogi Publications., 3rd Edition., 2009.
3. Romer A.S. & Parson, T.S "*A vertebrate body",* W.B Saunders, Philadelphia 1986.
4. Young J.Z., "*Life of Vertebrates"*., ELBS,1988.

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DEPARTMENT OF ZOOLOGY – UG

(w.e.f. 2021 – 2022 onwards)

SKILL BASED ELECTIVE

Title of the Paper	**: Vermitechnology**		
Semester	**: II**	**Contact hours**	**: 2**
Sub Code	**: 21SEZ21**	**Credits**	**: 2**

Objectives:

1. To understand the basic principles and procedures of Vermicomposting and Vermiculture technology
2. To make students aware of ecofriendly agriculture by way of organic farming utilizing the byproducts of vermiculture.
3. To create knowledge and avenues for self employment.

UNIT-I Introduction-Scope & Importance of Vermitechnology- Classification of earthworms – External morphology of earthworm.

UNIT-II Selection of earthworm species for composting - commercially available earthworm-Collection and preservation of earthworms for Vermicomposting - Vermiculture techniques.

UNIT-III Raw materials for Vermicomposting -Maintanence of composting- Methods of Vermicomposting –Collection of Vermicompost- vermiwash.

UNIT-IV Role of Earthworms in organic forming -Use of Vermicompost for crop production, Land improvement and Reclamation –Recycling of Wastes through Vermicomposting.

Annexure - 5

UNIT-V Large scale manufacture of Vermicompost,Packaging of Vermicompost and its Marketing-Economic importance of vermicompost-vermicompost agencies (BERI – Bhawalkar Ecological Research Institute in pune&BAIF- Bhartiya Agro Industries Foundation).

Text book:

1.M. Seethalekshmy & R.Santhi , "*Vermitechnology",* Saras Publications 2012

Reference Books:

1. Edwards,C.A,.Bohlen,P.J, Lindon,D.R and Subler,S "*Earthworms in Agroecosystems*. In:Earthworm Ecology and Biogeography in North America" Lewis Publisher,Boca Raton., FL,PP:185-213.1995.

2. Edwards,C.A & Bohlen,P.J,., "*Biology and Ecology of Earthworms"* 3rd Edition.,Springer Science & Business Media, 1996.

3. Mary Violet Christy,A., "*Vermitechnology",* MJP Publishers. 2008.

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DEPARTMENT OF ZOOLOGY – UG

(w.e.f. 2021 – 2022 onwards)

SKILL BASED ELECTIVE

Title of the Paper : Clinical Microbiology
Semester : II **Contact hours : 2**
Sub Code : 21SEZ22 **Credits : 2**

Objectives:

1. To impart knowledge of the basic principles of bacteriology , virology , mycology and parasitology.
2. To make students understand the nature of pathogenic microorganisms , pathogenesis, laboratory diagnosis ,transmission ,prevention and control of dieseases common in the country.
3. To identify and discover cures for human dieseases.

UNIT- I Protozoan diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1. Amoebiasis 2. Balantidiasis3.Vaginitis

UNIT-II Fungal diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1.Phycomycoses 2.Candidiasis 3.Actinomycosis (Actinomycitis bovis)

UNIT-III Bacterial diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1. Tuberculosis (air-borne) 2. Syphilis (contagious) 3. Cholera (water-borne).

UNIT-IV Viral diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1.Influenza (Bird flu) 2.Polio.3. Chicken pox

UNIT-V Insect – borne diseases: Causative organisms, mode of transmission, pathogenicity, symptoms, treatment and prophylaxis 1. Chikungunya 2. Dengue fever 3.Sleeping sickness.

Annexure -5

Text Book:

1. Dubey R.C. & Maheswari D.K., "*A text Book of Microbiology*"., S.Chand & Company Pvt, Ltd.2110.

Reference Books :

1.William Irving.et.al., "*Medical microbiology"*., Taylor and Francis Group 2005.

2.Patrick Murray ,Ken Rosenthal &Michael Pfaller.," *Medical Microbiology*" 8th Edition, 2015.

3. Jawetz., Melnick & Adelbergs.,"Medical Microbiology"26th Edition,2010.

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(w.e.f. 2021 – 2022 onwards)

NON MAJOR ELECTIVE

Title of the Paper : Ornamental fish culture
Semester : II **Contact hours : 2**
Sub Code : 21NMZ2 **Credits : 2**

Objective:

1. To analyse the impact of the aquarium fish trade on social and natural environments.
2. To collect baseline data on the ecosystems, socio –economy and diversity of fishes.
3. To develop best handling practices for the care of fishes .

UNIT-I Scope and importance of Ornamental fishes. Identification and salient features- Siamese fighting fish, Gold fish, Rosy barb, tiger barb, Angel fish, Black molly, Guppy and Swordtail.

UNIT – II Construction of aquarium : Size and Shape of fish tank, bottom settings , stocking of fish ,Accessories of fish tank – aerators, types of filters , nets, lights and hood.

UNIT - III Transport of fishes**:** Oxygen packing , Food and feeding: Culture of live food organisms – Chironomous larva tubifex ,Artificial feed – Pellet feed.

UNIT – IV Breeding methods: Siamese fighting fish, Gold fish , Black molly , Guppy and sword tail.

UNIT – V Common diseases and treatment of ornamental fishes : Protozoan diseases (White spot disease), Fungal disease (Ichthyosporidium), Bacterial diseases (Dropsy disease and ectoparasites).

Annexure - 5

Text books :

1. Arumugam et.al., "*Ornamental Fishes"*, Saras Publications. 2012

2. Jameson J. D and R. Santhanam , **"***Manual of ornamental fishes and farming Technologies"* **,** Fisheries college & Research Institute **,** Tamilnadu. 1996,

Reference Books :

1. Ramanathan . N and Francis,T., "*Manual of Breeding& Larval rearing of cultivable fishes"*, Tamilnadu Veterinary & Animal Sciences University, Chennai 1996.

2. Santhanam R., Sukumaran .N and Natarajan "*Manual of fresh water Aquaculture",* P. Oxford and IBH Publishing.Co Pvt . Ltd, New Delhi.1990.

3. Sundaraj.S, and Thilakar .S., "*Manual of tropical fish diseases and diagnosis,* Tamilnadu Veterinary & Animal sciences University – Chennai, 1999.

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DEPARTMENT OF ZOOLOGY – UG

(w.e.f. 2021 – 2022 onwards)

Title of the Paper : Lab in Invertebrata & Chordata
Semester : II **Contact hours : 2**
Sub Code : 21Z2P **Credits : 2**

Anatomical observation and comments on the following systems (Models / visual aids/ charts and transparency.

1. Cockroach - Digestive System & Reproductive System
2. Earthworm - Nervous system
3. Calotes - Arterial system
4. Rabbit - Reproductive System

Mountings:

1. Earthworm - Body Setae
2. House Fly - Mouth Parts
3. Shark - Placoid scales

Spotters:

Protozoa	:	Paramecium conjugation, Entamoeba
Porifera	:	Spicules and gemmules,
Coelenterata	:	Physalia and Aurelia
Platyhelminthes	:	Taenia solium, Liver fluke entire
Annelida	:	Chaetopterus and Heteroneries.
Arthropoda	:	Peripatus and Sacculina.
Mollusca	:	Nautilus and Chiton.
Echinodermata	:	Star Fish& Sea- urchin
Prochordata	:	Amphioxus, Balanoglossus and Ascidian
Agnatha	:	Petromyzon
Pisces	:	Echeneis and Hippocampus

Annexure - 5

Amphibia	:	Rhacophorus , Salamander and Bufo.
Reptilia	:	Naja naja, Draco and Chaemeleon
Aves	:	Duck and Kite
		(beak and claw adaptations)
Mammallia	:	Bat and Echidna
Osteology	:	Fore and hind limbs of rabbit
	:	Synsacrum of Bird, Skull of Calotes.
		Field trip compulsory

Annexure – 5a

E.M.G. YADAVA WOMENS COLLEGE, MADURAI -14.

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CBCS
DEPARTMENT OF ZOOLOGY – UG
ADD ON COURSE

(w.e.f. 2021 – 2022 onwards)

Entrepreneurial Bee Keeping

1. This Course is taken up by first year Zoology students
2. Period of study : I Semester

COURSE STRUCTURE

Contact Hours: 30 hrs

Credit: 1

S.No.	Sem	Subject Code	Title of the Paper
1.	**I**	**21ZAOC**	**Theory:** Entrepreneurial Bee Keeping
2.	**I**	**21ZAOCP**	**Practical:** Lab in Entrepreneurial Bee Keeping

Annexure -5a

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CBCS
DEPARTMENT OF ZOOLOGY – UG
ADD ON COURSE

(w.e.f. 2021 – 2022 onwards)

Entrepreneurial Bee Keeping

Title of the Paper : Entrepreneurial Bee Keeeping
Semester : I **Contact hours: 30hrs**
Sub Code : 21ZAOC

Objectives:

1. To inculcate importance of Bee keeping and honey processing in relation with entrepreneurship development.
2. To give students knowledge about various techniques of Bee keeping and honey processing and its marketing to make them self sustainable after graduation.
3. To teach techniques of construction of Bee Hives and its maintenance.
4. To teach students about Honey production and health related problems with Honey bees.

Unit I : **Introduction to Bee Keeping**

Importance of Honey bees – Benefits of Bee keeping – Honey Bee products – Nature of work.

Unit – II :Indian Honey Bees

Caste of Bees-Commercially important Bee species and their life Cycle.(*Apis dorsata, Apis cerana indica)*

Unit III : Apiary site selection and Management

Location of Apiary,starting a colony and establishment of a beehive-Seasonal management of Apiary.

Unit IV : Diseases of Honey Bees and their management

Viral diseases-Sac Brood and Thai sac Brood disease

Bacterial diseases – American Fowl Brood and Septicemia

Fungal diseases – Chalk Brood

Protozoan diseases – Amoeba disease

Unit V: Entrepreneurship Skills & Government Funds

Preparing a Business plan for Bee keeping – Keeping Records-Hiring People – Economics of Bee Keeping(For 50 colonies).

Text Book :

- Mc Chercain and Ramachandran., Bee Keeping in south India ,

Reference books:

1. Sardar Singh.,Beekeeping in India Hardcover., Indian Council of Agricultural Research; First Edition first Printing ,1962
2. Dharm Singh and Devender Pratap Singh.,A Handbook of Beekeeping ., Agrobios (India) ,2006
3. Prospective in Indian Apiculture - R.C. Mishra
4. Rearing queen bees in India - M.C. Suryanarayana et. al.
5. Bee Keeping in India - G. K. Ghosh
6. Technology and value addition of Honey - Dr. D. M. Wakhle and K. D. Kamble.
7. A. I. Root Bee culture , Indian Bee Journal - All India Bee Keeping Association Asian Bee Journal

PRACTICALS

Title of the Paper: Lab in Entrepreneurial Bee Keeping
Subject Code :21ZAOCP

List of Experiments:

1. Identification of Honey Bees-Drone Bee,Queen Bee, Worker Bee.
2. Bee Keeping Equipments-Typical Bee Hive,Hive stand,Smoker,Queen Excluder,Bee Brush,Honey Extractor
3. Harvest,Processing and Marketing of Honey.
4. Field visit and interaction with Bee keepers and other supportive agencies

Annexure – 5b

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CBCS
DEPARTMENT OF ZOOLOGY – UG
VALUE ADDED COURSE

(w.e.f. 2021 – 2022 onwards)

Medical Coding

1. This Course is taken up by third year zoology students
2. Period of study : V Semester

COURSE STRUCTURE

Contact Hours: 30 hrs

Credit: 1

S.No.	Sem	Subject Code	Title of the Paper
1.	**V**	**21ZVAC**	**Theory:** Fundamentals of Medical Coding (FOMeC)
2.	**V**	**21ZVACP**	**Practical:** Lab in Fundamentals of Medical Coding (FOMeC)

Annexure – 5b

E.M.G. YADAVA WOMENS COLLEGE, MADURAI -14.

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CBCS
DEPARTMENT OF ZOOLOGY – UG
VALUE ADDED COURSE

(w.e.f. 2021 – 2022 onwards)

Title of the Paper: Fundamentals of Medical Coding (FOMeC)

Semester : V **Contact Hours :** 30 Hrs
Subject Code : **21ZVAC**

Objectives:

- Anatomy Structure of the human body to increase your understanding.
- Physiology how the human body functions.
- Medical definitions and terminology Includes pronunciation and use of medical prefixes.
- Coding medical procedures what to code and how to prepare the forms.
- Professional claim information How to set up medical claims for Medicare, Medicaid, private insurance companies, HMOs, PPOs, workers' compensation and personal injury cases.

Unit I

Language of Medicine (LOM) - Paper I

Basic word structure, combining forms & terms -Prefixes & suffixes -Pharma/ radiology/ oncology

Unit II

Gastroenterology & urogenital -Cardiovascular & respiratory -Musculoskeletal & neurology

Unit III

Dermatology -Ophthalmology & ENT-Hematology, lymphatic, immunology & endocrinology

Unit IV

Medical Coding Essentials (MCE) - Paper II

Ground Rules – A Quick Look, Taxonomy of Code Sets, Intention of Each Division, physician's / hospital coding & work types - Clinical abbreviations & laboratory data -

The AAPC, responsibilities, ethics, and HIPAA - Evolution and Origin of Medical Language-Scopes and Earnings of the Industry & Ladder of Outsourcing - Individual Calisthenics .

Unit V

Medical English basics & Americanism for coders -AR analysis / AR callers & submitting -Guidelines of CPT – Current Procedural Coding, Sections and Ranges of CPT- Introduction to ICD 10 CM, Guidelines of ICD 10 CM, Categories and Sections of ICD 10 CM, ICD 9CM Vs ICD 10 CM -Introduction to HCPCS - Healthcare Common Procedure Coding System, Guidelines of HCPCS.

PRACTICALS

Title of the Paper: Lab in Fundamentals of Medical Coding (FOMeC)

Subject Code: 21ZVACP

a) Pharmacological units and measurements with numbers, Figures & Special Symbols
b) Usage of search engines, application software, & standard references
c) Justification of Employability and Introspection, Interviewee and Interviewer View Points
d) Processes and Attempts of Screening Procedures (Practical)
e) Operational methods, billing services, coding, charges, & audit
f) Method of CPT Coding with Workouts
g) Method of ICD 10 CM Coding with Workouts
h) Introduction to ICD 11 CM
i) Method of HCPCS Coding with Workouts
j) Pre-evaluation & evaluation