

Department	ZOOLOGY	
Course	III B.SC	Effective from the Year:2016
Subject Code : 16UZY618 Title : MAJOR ZOOLOGY PRACTICAL – IV (Ecology, Evolution, Biotechnology, Microbiology Sericulture and Aquaculture)		Semester V & VI
Hrs/Week :	2	Credit:4
Objectives	➤ To obtain some practical knowledge in ecology and evolution, biotechnology and microbiology, sericulture and aquaculture ➤ To study the physico-chemical nature of environment	

Components –

1. Experiments -----	2X 10 = 20
2. Spotters-----	4X5 = 20
3. Field visit/ Micro-environmental study/report preparation-----	= 10
4. Record -----	= 10
Total -----	= 60
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Content
EXPERIMENTS • Estimation of dissolved oxygen in water samples. • Estimation of carbondioxide • Determination of primary productivity • Estimation of salinity in water samples • Determination of pH in water samples • Culture medium preparation (Demonstration only) • Milk Methylene Blue Test • Hanging drop preparation • Morphology and morphometric measurements of fish by using model SPOTTERS Ecology • Sacculina on Crab • Leech • Taenia • Physalia • Albunea • Hippa • Anguilla Biotechnology/ Microbiology

- E-Coli
- Plasmids
- Bt – Bacillus thuringiensis
- Biodiesel Plant – Jatropha
- PCR
- Micropipette
- Magnetic stirrer
- Laminar Air Flow
- Gel Electrophoresis

Sericulture

- Life cycle of Bombyx mori
- Silkworm
- Cocoon
- Mulberry shoot
- Mulberry leaf
- Netrika/chandrika
- Leaf chamber

Aquaculture

- Common Carp
- Gill net
- Hook
- Fish parasite – Argulus
- Chinese dip net

Evolution

- Coccox
- Forelimb modifications.
- Fossil
- Peppered moth
- Vermiform appendix

Total Contact Hrs

52

Mark Distribution:

Total Marks	Internal(CIA)	Marks	End of semester Practical Examination (ESE)	Marks
100	Practical Skill/observation	10	Experiments	20
			Spotters	20
	Model Practical Examination	20	Field visit /Micro-environmental study/ report preparation	10
	Record work	5	Record	10
	Attendance	5		
	Total Marks	40	Total Marks	60

Reference Books:

1. Ganga , G and Sulochana chetty,(1999). An introduction to sericulture. Oxford and IBH Publishing company Pvt. Ltd. New Delhi
2. Jayasurya, (2013). Economic Zoology. Saras publication. Nagarcoil, Kanyakumari Dist. Tamil Nadu
3. Kumaresan. V (2012) Biotechnology. Saras publication. Nagarcoil, Kanyakumari Dist. Tamil Nadu
4. Odum, E. P (1971) Fundamentals of ecology W.B. Sanders Company, London
5. Arumugam, N. (2014) Aquaculture SARAS Publications, Nagercoil, Tamilnadu.
6. ICAR Publication (2006) 1st edition. Hand book of fisheries and aquaculture, Directorate of information and publicatios of agriculture. Indian Council of Agricultural Research, New Delhi


Head of the Department

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Principal :-

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Course	III B.SC	Effective from the Year:2017
Subject Code : 17UZY618 Title : MAJOR ZOOLOGY PRACTICAL – IV (Ecology, Evolution, Biotechnology, Microbiology Sericulture and Aquaculture)		SemesterV &VI
Hrs/Week :	2	Credit:4
Objectives	➤ To obtain practical knowledge in ecology, evolution, biotechnology, microbiology, sericulture,aquaculture ➤ To study the physico-chemical nature of environment	

Components –

1. **Experiments** ----- 2X 10 = 20
2. **Spotters**----- 4X5 = 20
3. **Field visit/ Micro-environmental study/report preparation**----- = 10
4. **Record** ----- = 10

Total ----- = 60

Content
EXPERIMENTS • Estimation of dissolved oxygen in water samples. • Estimation of carbondioxide • Determination of primary productivity • Estimation of salinity in water samples • Determination of pH in water samples • Culture medium preparation (Demonstration only) • Milk Methylene Blue Test • Hanging drop preparation • Morphology and morphometric measurements of fish by using model. • Water quality analyzer (Demonstration only) SPOTTERS Ecology and Evolution • Sacculina on Crab • Albunea • Hippa • Anguilla • Coccyx • Fossil • Peppered moth • Vermiform appendix Biotechnology/ Microbiology • E-Coli • Plasmids • Biodiesel Plant – Jatropha • PCR • Micropipette • Magnetic stirrer • Laminar Air Flow • Gel Electrophoresis Sericulture • Silkworm

• Cocoon • Mulberry shoot • Mulberry leaf • Netrika/chandrika • Leaf Mosaic disease • Leaf Blight disease Aquaculture • Common Carp • Gill net • Hook • Fish parasite – Argulus • Chinese dip net • Edible Oyster • Pearl oyster – <i>Pinctada vulgaris</i>	
Total Contact Hrs	52

Mark Distribution:

Total Marks	Internal(CIA)	Marks	End of semester Practical Examination (ESE)	Marks
100	Practical Skill/observation	10	Experiments	20
			Spotters	20
	Model Practical Examination	20	Field visit /Micro-environmental study/ report preparation	10
	Record work	10	Record	10
	Total Marks	40	Total Marks	60

Reference Books:

1. Ganga , G and Sulochana chetty,(1999). An introduction to sericulture. Oxford and IBH Publishing company Pvt. Ltd. New Delhi
2. Jayasurya, (2016). Economic Zoology. Saras publication. Nagarcoil, Kanyakumari Dist. Tamil Nadu
3. Kumaresan. V (2016) Biotechnology. Saras publication. Nagarcoil, Kanyakumari Dist. Tamil Nadu
4. Odum, E. P (1971) Fundamentals of ecology W.B. Sanders Company, London
5. Arumugam, N. (2016) Aquaculture SARAS Publications, Nagercoil, Tamilnadu.
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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	18UZY618	Title	Batch :	2018-2021
		MAJOR ZOOLOGY PRACTICAL – IV (Ecology, Evolution, Biotechnology, Microbiology Sericulture and Aquaculture)	Semester	V & VI
Hrs/Week:	2		Credits:	4

Course Objective

- To obtain practical knowledge in ecology, evolution, biotechnology, microbiology, sericulture, aquaculture
- To study the physico-chemical nature of environment

Course Outcomes (CO)

K3	CO1	To recollect the knowledge on Ecology, Evolution, Biotechnology, Microbiology, Sericulture and Aquaculture
K4	CO2	To understand the estimation of different water quality parameters, microbial culture and morphometric measurement of fish.
K5	CO3	To access the micro environment and report preparation.

Content

EXPERIMENTS

- Estimation of dissolved oxygen in water samples.
- Estimation of carbondioxide
- Determination of primary productivity
- Estimation of salinity in water samples
- Determination of pH in water samples
- Culture medium preparation (Demonstration only)
- Milk Methylene Blue Test
- Hanging drop preparation
- Morphology and morphometric measurements of fish by using model.
- Water quality analyzer (Demonstration only)

SPOTTERS

Ecology and Evolution

- Sacculina on Crab
- Albunea
- Hippa
- Anguilla
- Coccyx
- Fossil
- Peppered moth
- Vermiform appendix

Biotechnology/ Microbiology

- E-Coli
- Plasmids
- Biodiesel Plant – Jatropha
- PCR
- Micropipette
- Magnetic stirrer

• Laminar Air Flow • Gel Electrophoresis Sericulture • Silkworm • Cocoon • Mulberry shoot • Mulberry leaf • Netrika/chandrika • Leaf Mosaic disease • Leaf Blight disease Aquaculture • Common Carp • Gill net • Hook • Fish parasite – Argulus • Chinese dip net • Edible Oyster • Pearl oyster – <i>Pinctada vulgaris</i>	
Total Contact Hrs	52

Mark Distribution:

Total Marks	Internal(CIA)	Marks	End of semester Practical Examination (ESE)	Marks
100	Practical Skill/observation	10	Experiments	20
			Spotters	20
	Model Practical Examination	20	Field visit /Micro-environmental study/ report preparation	10
	Record work	10	Record	10
	Total Marks	40	Total Marks	60

Hands on experience in practicals, Activity,

Books for Reference:

1. Ganga , G and Sulochana chetty,(1999). An introduction to sericulture. Oxford and IBH Publishing company Pvt. Ltd. New Delhi
2. Jayasurya, (2016). Economic Zoology. Saras publication. Nagarcoil, Kanyakumari Dist. Tamil Nadu
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6. ICAR Publication (2006) 1st edition. Hand book of fisheries and aquaculture, Directorate of information and publicatios of agriculture. Indian Council of Agricultural Research, New Delhi

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	H	H
CO3	M	S	H	M	M


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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	19UZY615	Title	Batch :	2019-2022
		MAJOR ZOOLOGY PRACTICAL - IV (Ecology, Evolution, Biotechnology, Microbiology, Sericulture and Aquaculture)	Semester	V & VI
Hrs/Week:	2		Credits:	4

Course Objectives

- To obtain practical knowledge in ecology, evolution, biotechnology, microbiology, sericulture and aquaculture
- To study the physico-chemical nature of environment.
- To understand the different water quality analysis

Course Outcomes (CO)

K3	CO1	To recollect the knowledge on Ecology, Evolution, Biotechnology, Microbiology, Sericulture and Aquaculture
K4	CO2	To understand the estimation of different water quality parameters, microbial culture and morphometric measurement of fish.
K5	CO3	To access the micro environment and report preparation.

Content

EXPERIMENTS

- Estimation of dissolved oxygen in water samples.
- Estimation of carbondioxide
- Determination of primary productivity
- Estimation of salinity in water samples
- Determination of pH in water samples
- Culture medium preparation (Demonstration only)
- Milk Methylene Blue Test
- Hanging drop preparation
- Morphology and morphometric measurements of fish by using model.
- Water quality analyzer (Demonstration only)

SPOTTERS

Ecology and Evolution

- Sacculina on Crab
- Albunea
- Hippa
- Anguilla
- Coccyx
- Fossil
- Peppered moth
- Vermiform appendix

Biotechnology/ Microbiology

- E-Coli
- Plasmids
- Biodiesel Plant – Jatropha
- PCR
- Micropipette

• Magnetic stirrer • Laminar Air Flow • Gel Electrophoresis Sericulture • Silkworm • Cocoon • Mulberry shoot • Mulberry leaf • Netrika/chandrika • Leaf Mosaic disease • Leaf Blight disease Aquaculture • Common Carp • Gill net • Hook • Fish parasite – Argulus • Chinese dip net • Edible Oyster • Pearl oyster – <i>Pinctada vulgaris</i>	
Total Contact Hrs	52

Mark Distribution:

Total Marks	Internal(CIA)	Marks	End of semester Practical Examination (ESE)	Marks
100	Practical Skill/observation	10	Experiments	20
			Spotters	20
	Model Practical Examination	20	Field visit /Micro-environmental study/ report preparation	10
	Record work	10	Record	10
	Total Marks	40	Total Marks	60

Hands on experience in practicals, Activity,

Books for Reference:

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Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	H	H
CO3	M	S	H	M	M


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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	20UZY615	Title	Batch :	2020-2023
		MAJOR ZOOLOGY PRACTICAL - IV (Ecology, Evolution, Biotechnology, Microbiology, Sericulture and Aquaculture)	Semester	V & VI
Hrs/Week:	2		Credits:	4

Course Objectives

- To obtain practical knowledge in ecology, evolution, biotechnology, microbiology
- To study the physico-chemical nature of environment.
- To understand the different water quality analysis
- To get the knowledge about silkworm rearing appliances
- To acquire knowledge of sericulture and aquaculture

Course Outcomes (CO)

K1	CO1	To recollect the knowledge on Ecology, Evolution,
K2	CO2	To understand the estimation of different water quality parameters, microbial culture and morphometric measurement of fish.
K3	CO3	To access the micro environment and report preparation.
K4	CO4	To acquire knowledge about sericulture and Aquaculture
K5	CO5	To understand the techniques of Biotechnology and Microbiology,

Content

EXPERIMENTS

- Estimation of dissolved oxygen in water samples.
- Estimation of carbondioxide
- Determination of primary productivity
- Estimation of salinity in water samples
- Determination of pH in water samples
- Culture medium preparation (Demonstration only)
- Milk Methylene Blue Test
- Hanging drop preparation
- Morphology and morphometric measurements of fish by using model.
- Water quality analyzer (Demonstration only)

SPOTTERS

Ecology and Evolution

- Albunea
- Hippa
- Anguilla
- Fossil
- Vermiform appendix
- Giraffe
- Lung fish

Biotechnology/ Microbiology

- E-Coli
- Plasmids

• Biodiesel Plant – Jatropha • PCR • Micropipette • Magnetic stirrer • Laminar Air Flow • Gel Electrophoresis Sericulture • Silkworm • Silk gland • Cocoon • Mulberry shoot • Mulberry leaf • Netrika/chandrika • Leaf Mosaic disease • Leaf Blight disease • Pebrine Aquaculture • Common Carp • Sucker fish • Live feed - Daphnia • Gill net • Hook • Fish parasite – Argulus • Chinese dip net • Edible Oyster • Pearl oyster – <i>Pinctada vulgaris</i> • Lerniasis	
Total Contact Hrs	52

Mark Distribution:

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2. Jayasurya, (2016). Economic Zoology. Saras publication. Nagarcoil, Kanyakumari Dist. Tamil Nadu
3. Kumaresan. V (2016) Biotechnology. Saras publication. Nagarcoil, Kanyakumari Dist. Tamil Nadu
4. Odum, E. P (1971) Fundamentals of ecology W.B. Sanders Company, London

5. Arumugam, N. (2016) Aquaculture SARAS Publications, Nagercoil, Tamilnadu.
6. ICAR Publication (2006) 1st edition. Hand book of fisheries and aquaculture, Directorate of information and publicatiois of agriculture. Indian Council of Agricultural Research, New Delhi
7. Sinha.J., Chatterjee.A.K. and Chattopadhyay. P. (2011) Advanced practical Zoology. Books and Allied pvt. Limited , Kolkata.

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M

H-High; M-Medium; L-Low


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