RVS COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

SULUR, COIMBATORE - 641402

DEPARTMENT OF MICROBIOLOGY

B.Sc., MICROBIOLOGY

VALUE ADDED PROGRAMME (VAP)

SCHEME & SYLLABUS

I YEAR – 2024 BATCH

II YEAR – 2023 BATCH

III YEAR – 2022 BATCH

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RVS COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)

DEPARTMENT OF MICROBIOLOGY

B.Sc., MICROBIOLOGY

VALUE ADDED PROGRAMME (VAP)

MUSHROOM CULTIVATION

Programme Code: VAPUMY

SYLLABUS

2024- 2027

RVS COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
DEPARTMENT OF MICROBIOLOGY
VALUE ADDED PROGRAMME (VAP)
MUSHROOM CULTIVATION

No.	Course Outcome (Cos): After completion of this course, the students will be able to achieve the following outcomes.	PSOs	Class Session	CL
CO1	Understand the role of fungi in ecosystem.	PSO2	3	U
CO2	Apply the knowledge of fungi in commercial cultivation.	PSO2	3	AP
CO3	Illustrate the factors and optimization of fungal cultivation.	PSO2	3	AP
CO4	Illustrate fungal diseases and its control.	PSO2	3	AP
CO5	Demonstrate market potential for mushroom cultivation.	PSO2	3	AP

SCHEME OF EXAMINATIONS

2024 - 2027 BATCH

YEAR	TITLE	SEMESTER	COURSE	Lecture Hours	Duration of Examination in Hours	Marks		
						CIA	EoS	TOTAL
I	MUSHROOM CULTIVATION	I	PAPER-I – Mushroom Cultivation	15	3	25	75	100
		II	PAPER –II - Mushroom Cultivation Practical	15	3	25	75	100

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DEPARTMENT OF MICROBIOLOGY
VALUE ADDED PROGRAMME (VAP)
MUSHROOM CULTIVATION

Total Lecture Hours: 15 Hours

UNIT **3 HOURS**

Introduction-mushroom cultivation

Biology of mushrooms - Fungi, fungus ecology, life cycle of fungi

Factors affecting mushroom cultivation- Temperature ranges

UNIT II **3 HOURS**

Mushroom farms and spawn production

Farm lay out, farm hygiene, - the processes to be performed at the mushroom farm preventive measure ,starter culture, sterilization, process clean environments - methods and applicationcultures preparation of media and slants, mother spawn, preparation of final spawn - Methods and application

UNIT III **3 HOURS**

Oyster mushroom cultivation

Preparation of substrate - Heat treatment, Methods and application

Spawning pasteurized substrates and sterilized bags, spawn run, fruiting and harvesting. - Methods involved incultivation

UNIT IV **3 HOURS**

Shiitake mushroom cultivation on plastic bags

Substrate preparation - Substrate formulation

Filling and heat treatment, spawning and spawn run, fruiting and harvesting - general procedures forfilling,steaming, Active vegetative form, mycelium to colonize the substrate and mature, factors that promote fruiting in

Shiitake cultivation on wood logs

Pests and Disease - Green moulds, mushroom flies, mites

UNIT V **3 HOURS**

Post-harvest and handling

Quality grades and harvest - Picking different types of mushrooms

Fresh market and drying - Conservation and drying methods

TEXT BOOKS:

1. Small scale mushroom cultivation | Edition: 1st | Digigrafi Netherlands | Peter Oei (2005)

REFERENCE BOOK

1. The Mushroom cultivator:A practical Guide to Growing mushrooms,AgarikonPress,PaulStamets and J.S.Chilton ,1984

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VALUE ADDED PROGRAMME (VAP)
MUSHROOM CULTIVATION PRACTICAL

Total Lecture Hours: 15 Hours

- Seed/ spore collection.
- Spawn preparation
- Substrate preparation- compost and straw
- Bed preparation- plastic bag.
- Bed inoculation
- Maintenance – temperature and humidity
- Harvesting- Picking

TEXT BOOKS:

1. Mushrooms: A Manual for Cultivation, Edition:1, PHI Learning Private Limited, New Delhi. Subratam.Dattas.V. NgachanBiswas (2012)

2.

REFERENCE BOOK

1. The Mushroom cultivator:A practical Guide to Growing mushrooms,AgarikonPress,PaulStamets and J.S.Chilton ,1984

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DEPARTMENT OF MICROBIOLOGY

B.Sc., MICROBIOLOGY

VALUE ADDED PROGRAMME (VAP)

BIOMASS PRODUCTION

Programme Code: VAPUMY

SYLLABUS

2023 – 2026

RVS COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
DEPARTMENT OF MICROBIOLOGY
VALUE ADDED PROGRAMME (VAP)
BIOMASS PRODUCTION

No.	Course Outcome(Cos): After completion of this course, the students will be able to achieve the following outcomes.	PSOs	Class Session	CL
CO1	Understand the media constituents and media formulation strategies for plant tissue culture.	PSO2	3	U
CO2	. Understand the lab design, principles, types of animal tissue culture.	PSO2	3	U
CO3	Apply the knowledge on bacterial, algal and fungal biomass production.	PSO2	3	AP
CO4	Execute the knowledge on preparation of oriental and continental fermented foods. .	PSO2	3	AP
CO5	Apply the knowledge of material selection, cultivation, processing and quality assessment in vaccine preparation.	PSO2	3	AP

SCHEME OF EXAMINATIONS

2023 BATCH & ONWARDS

YEAR	TITLE	SEMESTER	COURSE	Lecture Hours	Duration of Examination in Hours	MARKS		
						CIA	EoS	TOTAL
II	BIOMASS PRODUCTION	III	**PAPER – I –** Biomass Production	15	3	25	75	100
		IV	**PAPER – II –** Biomass Production Practical	15	3	25	75	100

RVS COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
DEPARTMENT OF MICROBIOLOGY
VALUE ADDED PROGRAMME (VAP)
BIOMASS PRODUCTION

Total Lecture Hours: 15 Hours

UNIT I **3 HOURS**

Plant tissue culture (PTC): Outline history of PTC – culture media – surface sterilization of explants and transfer of explants – types of plant tissue culture – culture of isolated single cells – synthetic seeds.

UNIT II **3 HOURS**

Animal tissue culture (ATC): ATC lab design – types of ATC: organ, primary, and continuous culture, (cell culture) – stem cell culture.

UNIT III **3 HOURS**

Microbial production: production of bacterial biomass – hydrocarbon and hydrogen utilizing bacteria – single cell protein from algae (Spirulina sp.) – production of fungal SCP (*Trichoderma* sp.).

UNIT IV **3 HOURS**

Oriental and continental fermented foods: Acidophilus milk – fermented fish – Bread – Olive Kimchi, Soy sauce.

UNIT V **3 HOURS**

Production of vaccines: Selection of material (seed lotting) – large scale cultivation – processing – blending – filling and drying - quality assessment.

TEXT BOOKS:

1. Plant tissue culture by T. Pullaich and M V Subba Rao. 2009. Scientific publishers.
2. Animal tissue culture by Sudhan Ganga. 2nd Edition. Oriental Publishers. University Press.

REFERENCE BOOKS

1. Bioprocess Technology by Kalaichelvan P T and I Arunpandi. 2007. MJP Publishers.
2. Food Microbiology by Bohra and Parihar. 2012. Agrobios Publishers, Jodhpur.

RVS COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
DEPARTMENT OF MICROBIOLOGY
VALUE ADDED PROGRAMME (VAP)
BIOMASS PRODUCTION PRACTICAL

Total Lecture Hours: 15 Hours

- Callus culture
- Spirulina biomass production
- Preparation of bread
- Primary culture of chick embryo fibroblast
- Quality checking of vaccine

TEXT BOOKS:

1. Plant tissue culture by T. Pullaich and M V Subba Rao. 2009. Scientific publishers.
2. Animal tissue culture by Sudhan Ganga. 2nd Edition. Oriental Publishers. University Press.
3. Laboratory Manual of Microbiology and Biotechnology, Medtech, 2018, K. R. Aneja, 2nd Edtion

REFERENCE BOOKS

1. Bioprocess Technology by Kalaichelvan P T and I Arunpandi. 2007. MJP Publishers.
2. Food Microbiology by Bohra and Parihar. 2012. Agrobios Publishers, Jodhpur.

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DEPARTMENT OF MICROBIOLOGY

B.Sc., MICROBIOLOGY

VALUE ADDED PROGRAMME (VAP)

ANIMAL HANDLING

Programme Code: VAPUMY

SYLLABUS

2022 – 2025 & ONWARDS

RVS COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
DEPARTMENT OF MICROBIOLOGY
VALUE ADDED PROGRAMME (VAP)
ANIMAL HANDLING

No.	Course Outcome(Cos): After completion of this course, the students will be able to achieve the following outcomes.	PSOs	Class Session	CL
CO1	Demonstrate animal handling skill development	PSO2	3	U
CO2	Illustrate laboratory animal care, management and experimentation.	PSO2	3	AP
CO3	Apply basic of manage animal facility, routine care and husbandry practices	PSO2	3	AP
CO4	Demonstrate animals, experimental procedures and techniques	PSO2	3	AP
CO5	Apply animal care quality control procedures.	PSO2	3	AP

SCHEME OF EXAMINATIONS

2022 BATCH & ONWARDS

YEAR	TITLE	SEMESTER	COURSE	Lecture Hours	Duration of Examination in Hours	MARKS		
						CIA	Eo S	TOTAL
III	ANIMAL HANDLING	III	PAPER – I – Animal Handling	15	3	25	75	100
		IV	PAPER – II – Project Report – Viva voce	15	3	25	75	100

RVS COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
DEPARTMENT OF MICROBIOLOGY
VALUE ADDED PROGRAMME (VAP)
ANIMAL HANDLING

Total Lecture Hours: 15 Hours

Unit 1: **Hours: 3**

Handling different types of Laboratory animals:

1. Different types of the laboratory animals, Classification.
2. Methods of handling of laboratory animals safely
3. Gender identification of different animals.

Unit 2: **Hours: 3**

Handling animal for experimentation:

1. Observing the normal and abnormal behavior of the animals.
2. Labeling of a sample cage used in the animal facility.
3. Demonstration of anesthetics in rat and mice for experiment.

Unit 3: **Hours: 3**

Experimentation methods in animals:

1. Blood collection in different animals through different routes.
2. Drug administration through different routes.

Unit 4: **Hours: 3**

Euthanasia of experimental animals:

1. Methods and ethical procedure of Euthanasia.
2. Drugs used in Euthanasia and disposal of dead animals.

Unit 5: **Hours: 3**

Surgical procedures of euthanized animal:

1. Surgical procedures for killing of experimental animals.
2. Collection and preservation of different tissues for histopathological study.

Text books:

1. Handbook of Laboratory Animal Anaesthesia and Pain Management Rodents. 1st edition, Edited by Cholawat Pacharinsak, Jennifer C. Smith.
2. Care and Management of Laboratory and Pet Animals. Y.B. Rajeshwari, K. Satyanarayan, S.B. Prasanna.

Reference Books:

1. Handbook of Laboratory Animal Anaesthesia and Pain Management Rodents. 1st edition, Edited by Cholawat Pacharinsak, Jennifer C. Smith.
2. Care and Management of Laboratory and Pet Animals. Y.B. Rajeshwari, K. Satyanarayan, S.B. Prasanna.

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VALUE ADDED PROGRAMME (VAP)
PROJECT REPORT – VIVA VOCE

Project work related any of the mentioned Discipline Specific Courses- case studies, in vitro laboratory performance with interpretation of results,