SEMESTER V	
Self Study : Vermitechnology	
Code : 18UZOSS3	**Credit : 2**

Vision : To impart knowledge on organic compost and equip the students for self employment

Mission : Acquire knowledge on different techniques in vermitechnology and become the entrepreneurs

Course Outcome

CO.No	**Upon completion of this course, students will be able to**	**PSO addressed**	**CL**
CO-1	classify and choose the suitable species of earthworm for making compost	1	Un
CO-2	examine the suitable physico-chemical parameters required for vermicomposting	2	An
CO-3	explain the different methods of vermicomposting	4	Un
CO-4	understand the preparation, composition and applications of vermiwash	5	Un
CO-5	examine the applications of vermitechnology in various fields	3	Ev
CO-6	describe the use of products of vermiculture	8	Ap
CO-7	demonstrate the vermiculture technique	7	Un
CO-8	develop skills for self employment	6	Cr

SEMESTER V	
Self Study : Vermitechnology	
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Unit I **Vermiculture Technique**

Definition- need for vermiculture-species selection -vermiculture process

Unit II **Vermicomposting Technology**

Selection of suitable species of earthworm, preparation of worm bed – maintainance of vermicomposting bed- harvesting the worms

Unit III **Vermicomposting Methods**

Pit method - bin method, windrow method, vermiwash- preparation- composition- applications

Unit IV **Vermicompost**

Vermicompost- chemical composition, physical and biological features- applications.

Unit V **Economic Importance of Earthworm**

Earthworm - as bait- as food - in agriculture - in medicines- in laboratory research purpose- benefits to society.

Books for Reference

1. Talashilkar S.C. and Dosani. 2005. *Earthworm in Agriculture.* First edition Agrobios Publications, Jodhpur
2. Renganathan L. S. 2006. *Vermibiotechnology from Soil Health to Human Health*. First edition, Agrobios, India.
3. Prakash Malhotra. 2008. *Economic Zoology*. First edition. Adhyayan Publishers and Distributers, New Delhi.
4. Gupta P. K. 2012. *Vermicomposting for Sustainable Agriculture.* 2nd Revised Edition, Agrobios, India.

SEMESTER III			
Skill Based Elective	**A. Fishery Products**		
Course Code: 21UZOS31	**Hrs/ Week: 2**	**Hrs/ Sem: 30**	**Credits: 2**

Objectives:

- To obtain knowledge on products of fisheries industry, their processing and preservation process.
- To encourage the students to follow hygiene in fish processing
- To develop entrepreneurial skills in the preparation of sea-food based convenience products in ready-to-eat or ready-to-cook forms

Course Outcome

CO. No.	Upon completion of this course, the graduates will be able to	PSO addressed	CL
CO-1	acquire knowledge on products and by-products of fisheries.	5	Un
CO-2	demonstrate various processing and preservation methods of fishery products	5	Un
CO–3	apply information on processing for the usage of fish by-products for industrial and domestic purposes.	7	Ap
CO–4	carry out study on sea weeds and analyse their usage as food for human consumption	2	An
CO–5	practice the preparation of value added fishery products.	8	Cr
CO–6	implement and discuss sanitation and quality control techniques.	7	Cr
CO–7	update the knowledge of preservation and processing techniques and recommend their use in day to day life.	7	Ev
CO-8	develop advanced techniques on fishery products.	8	Un, Cr

Unit I **Value Added Fishery Products**

Fish pickles, fish sauce, fish cutlets, fish balls, fish soup powder and fish sausage. Battered and braided products-fish finger, fish wafer.

Unit II **Fishery By Products**

Fishery by products - fish oil – isinglass – chitosan – pearl essence – shark fins

Unit III **Seaweed Products**

Uses of agar, algin and carrageenan. Use of sea weeds as food for human consumption.

Unit IV **Techniques of Preservation and Processing**

Freezing - quick, slow freezing; freezer - horizontal plate freezer, tunnel air blast freezer - cryogenic freezing; canning; smoking - hot, cold, electrostatic smoking; pickling; drying – natural, artificial; salting - dry, wet and mixed salting.

Unit V **Quality Control and Sanitation**

Sanitation in processing – environmental hygiene and personal hygiene in processing. Fishery guidelines for HACCP and FSSAI on fish and fish products.

Text Book

1. Dr. Surekha Gupta. *Textbook of Fishery*. New Delhi: Ane Books Pvt. Ltd. 2010

Books for Reference

1. Gopakumar, K. *A Textbook of Fish Processing Technology.* New Delhi: ICAR. 2002.
2. Gupta, S.K. and P.C Gupta. *General and Applied Ichthyology* [*Fish and fisheries*]. Ramnagar New Delhi: Chand and Company Ltd. 2006
3. K.R. Ravindranathan. *A Text book of Economic Zoology*. New Delhi*:* Wisdom Press. 2013.
4. Ayyapar, S. *Handbook of Fisheries and Aquaculture*. New Delhi: 2010
5. Srivastava, C.B.L. *A Text book of Fishery Science – Indian Fisheries.* New Delhi: Kitab Mahal. 2006.