Course Code: ZOO 328 **Course Title: Fish Processing**
Number of Credits: 3
Effective from AY: 2020 -21

Prerequisite for the Course:	Basic knowledge on Fish biology, Fishery sciences is prerequisite for this course.	
Objectives:	1. To develop knowledge about post harvest management of fishes. 2. To understand the various aspects of fish preservation and processing	
Content	**Module 1:** Post Harvest Technology: Principles and importance of fish preservation. Fish spoilage-post mortem changes and rigor mortis, post rigor spoilage. Methods of fish preservation-Icing, Freezing, Cold storage, Drying, Salting, Smoking, Canning and Fish Pickling. Fish product and Byproduct: Fish Oil, Fish liver oil, Fish meal, Fish manure, Fish flour, fish glue and isinglass, chitin **Module 2:** Fish and fishery microbiology: Microflora of aquatic environment. Autotrophic and heterotrophic microorganisms in aquatic environment. Prokaryotic growth – characteristic features of bacterial growth curve – Effect of environmental factors on growth. Nutrition and growth of bacteria – different types of media for isolation of bacteria and fungi. Isolation and cultivation of bacteria and fungi from water and sediment. Health significant bacteria in culture ponds. Culture characteristics and epidemiology of *E. coli*, pathogenic *Vibrio*, *Salmonella*, *Aeromonashydrophila*, and *Pseudomonas*. Perishability of seafood – Microbial spoilage of fish and shell fish. Spoilage microflora. Intrinsic and extrinsic factors affecting spoilage. Microflora associated with body parts. Food borne pathogens. Sources of contamination. **Module 3:** Quality Assurance of Fishery Products: Quality control: basic concepts, quality and quality control. Sanitation procedures in seafood processing plants. Waste management in fish processing industries. Risk factors in seafood bio toxins, seafood pathogens, endogenous parasites. Methods of evaluating fish freshness and quality – organoleptic, physical, chemical, microbiological and instrumental methods. Quality standards in India and major importing countries like USA, Japan and EU. Export of fishery products from India – major countries, important products, export documents and procedures. Traceability, Quality certifications, Eco-labeling.	6 hrs 6 hrs 6 hrs 3 hrs 3 hrs 4 hrs 4 hrs 4 hrs

Pedagogy:	Lectures/ tutorials/Group discussions/PBL/self-study
Learning Outcome:	1. Understand the basic concepts fish preservation. 2. Identify main microbes concerned with fish processing 3. To Understand the importance of quality control in fish farm
References/ Reading	1. Biswas K.P. (2004). Fish Processing and Preservation. Daya Pub. House. 2. Govindan T.K (1985). Fish Processing Technology. Oxford & IBH Pub. Co. 3. Badapanda K.C (2013). Fish processing and preservation technology. Narendra Publishing House 4. Fernandes R. (2009) Microbiology Handbook: Fish and Seafood. Leatherhead Food Research Association; 2nd New edition edition. 5. Harry W. Seeley, Paul J. Vandemark, and John J. Lee (1990)- Microbes in Action: A Laboratory Manual of Microbiology 6. Pawar and Diganawala (2010)- General Microbiology – Vol. I and Vol. II. Himalaya Publishing House.