

Prospectus

2022-23



Certificate Courses

Short Courses

COLLEGE OF FISHERIES

**Guru Angad Dev Veterinary & Animal Sciences University
(GADVASU), Ludhiana (Punjab)**



www.gadvasu.in



DISCLAIMER

The statements made and information contained in the prospectus is of general nature for the knowledge of the candidates seeking admission to various programmes of the College of Fisheries (Ludhiana). The information contained herein is believed to be correct at the time of publication/uploading. However, the university reserves the right to make any alteration(s) in the provision(s) contained in the prospectus, at any time without any prior notice, where upon the university will not be responsible for any hardship or expenses incurred by any candidate or any other person on account of such amendments, additions, omissions or errors, no matter how they are caused. The Candidates are advised to visit GADVASU website (www.gadvasu.in) regularly to see the updates regarding admission/counseling

JURISDICTION

Any dispute/litigation arising out of anything concerned with the university and its activities, including admissions/operation of Academic & Hostel rules will be subject to the jurisdiction of the Courts at Ludhiana only

ADMISSION ENQUIRIES

Contact Person: Mrs. Sunita Sharma (Academic Clerk)

M.: +91-79730-23073, Whatsapp: 98724-37964

Contact No. (Office): 0161-2414061, 0161-2414056

Email: fisheriescof@gmail.com



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INTRODUCTION

I. COLLEGE OF FISHERIES

Fisheries sector is a very fast-growing vibrant sector, offering multiple socio-economic contributions augmenting food/nutritional security, livelihood/employment generation and national economy. During 2019-2020, total fisheries production of India was recorded as 14.16 metric million tones (MMT), with total employment (fish farmers, fishers and workers) to about 28 million people and export earnings of 46.66 crores (6.68 billion US \$); which contributed 1.24 and 7.28% to total Indian economy (GVA) and Indian's agriculture economy (AGVA). The total fisheries production of the country is envisaged to be increased to 22 mmt by the year 2024-25 and Inland sector (presently contributing about 74% to total production) is expected to fill the gap as the marine resources are already being harvested near to its estimated potential.

College of Fisheries (COF), Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana, one of the constituent college of GADVASU, was established in April, 2008, to produce professionally proficient human resource (graduates and postgraduates) to serve the fisheries sector in different capacities (teaching, research, extension, planning and livelihood generation) for holistic development through productivity enhancement and socio-economic sustainability. Since its establishment, the College has registered a commendable academic growth and has made significant R&D contributions for the development of the inland fisheries sector in the north-western region of India.

With five departments (Aquaculture, Fisheries Resource Management, Aquatic Environment, Fish Processing Technology and Fish Engineering), competent experienced faculty, smart classrooms, fully equipped modern laboratories and a well-developed "Instructional cum Research Farm" (spread over an area of 6 ha), COF, GADVASU possesses hi-tech facilities for effectual teaching, capacity building (experiential learning, skill development, trainings and demonstrations), advanced research and extension programs. COF is accredited by the ICAR with "A" grade and is offering undergraduate (UG) and postgraduate (PG) degree programs in different disciplines of fisheries. Further, to develop skilled human resource in emerging areas of fisheries and aquaculture, COF has also initiated Entrepreneurial/Capacity Building Certificate (4) and Short (2) Courses during the academic year 2021-22.





II. CERTIFICATE AND SHORT COURSES

S. No.	Programme	Minimum Duration	Eligibility Qualifications
1	Certificate Courses (4 Courses) <ol style="list-style-type: none">1. Fish Hatchery Management2. Aquarium Sciences3. Fish processing Technology4. Aqua-Clinics	6 Months	Graduate in any Science Discipline (Preference will be given to candidates with B.F.Sc. degree)
2	Short Courses (2 Courses) <ol style="list-style-type: none">1. Aquarium Fabrication and Maintenance2. Fish Feed Formulation and Manufacturing	4 Weeks	10+2 with Science





III. ADMISSION DETAILS IN RESPECT TO CERTIFICATE AND SHORT COURSES

Course Name	No. of Seats	Course Fee (Rs.)*	Application Processing Fee	Period	Dates for Application Submission	Counseling/ Interview	Date of Registration
6-Month Certificate Courses** (For details – See Annexure – I)							
Fish Processing Technology	5	15,000/-	1000/-	September to February	18-08-2022 to 08-09-2022	14-09-2022	19.09.2022
Fish Hatchery Management	5	15,000/-	1000/-	April to September	01-03-2023 to 24-03-2023	30.03.2023	05.04.2023
Aquarium Sciences	5	15,000/-	1000/-	February to August	10-01-2023 to 03-02-2023	09-02-2023	15.02.2023
Aqua-Clinics	5	15,000/-	1000/-	February to August	10-01-2023 to 03-02-2023	09-02-2023	15.02.2023
1-Month Short Courses** (For details – See Annexure – II)							
Aquarium Fabrication and Maintenance	5	5,000/-	500/-	September/ October	08-08-2022 to 29-08-2022	31-08-2022	05.09.2022
Fish Feed Formulation and Manufacturing	5	5,000/-	500/-	September/ October	09-09-2022 to 29-09-2022	04-10-2022	10.10.2022

* Excluding Boarding/Lodging

** Certificate Course - 3 Month Online (Theory) & 3 Month Offline (Practical)
Short Course - 15 Days Online (Theory) & Days Offline (Practical)



IV. (i) DETAILS OF CERTIFICATE COURSES

Annexure – I

1. Certificate Course in Fish Hatchery Management

Skilled human resource is required for achieving optimized seed production targets in fish and shrimp hatcheries across the country. Against the national demand of 60000 million fry (seed), about 40,000 million fish fry is being produced by over 1700 hatcheries in India, leaving a gap of 20,000 million. Pradhan Mantri Matsya Sampada Yojna (PMMSY) launched in 2020 by Department of Fisheries (DOF), Ministry of Fisheries, Animal Husbandry and Dairying (MFAHD), Government of India (GOI), is also supporting this activity to promote self-employment among skilled aspiring candidates.

The certificate course in 'Hatchery Management' will provide professional competency to candidates for placement as hatchery managers or supervisors in government and private hatcheries, besides boosting entrepreneurial confidence for self-employment in fish seed production.

Course Details

Sr. No.	Course No.	Course Title	Credit hrs.
1.	FHM-11	Introduction to Fish Reproductive Biology	2 (2+0)
2.	FHM-12	Fish Brood Stock Management	3 (2+1)
3.	FHM-13	Hatchery and Seed Farm Designing	2 (1+1)
4.	FHM-14	Fish Breeding & Hatchery Management	3 (2+1)
5.	FHM-15	Nursery Pond Management and Seed Quality	2 (1+1)
6.	FHM-PWS-16	Project Work and Seminar	4 (0+4)
Total			16 (8+8)

Syllabus

1. **FHM-11** **Introduction to Fish Reproductive Biology** **2 (2+0)**

Theory:

Sexual maturity and breeding season of different cultivable species; Environmental regulation of reproduction; Fish pituitary gland and its role in fish reproduction; Hormonal control in fish reproduction; Courtship and parental care; Sexual dimorphism; Egg layers and live bearers; Morphology of testis and ovary; Maturity Stages; Oogenesis and spermatogenesis; sex ratio and spawning behavior; type of eggs; Embryo development and larval stages; early maturity through environmental and nutritional manipulations



2. **FHM-12** **Fish Brood Stock Management** **3 (2+1)**

Theory:

Brood-stock selection; brood stock transport; brood stock pond management; brood stock nutrition- feed formulation and feeding management; water quality management; health management; inbreeding depression; technological interventions for enhanced reproductive performance; brood banks; brood stock development for early maturity, multiple and selective breeding programs

Practical:

Hands on training in brood stock handling; transport, selection and conditioning; Experiential learning in brood stock rearing; brood stock feed formulation and manufacturing; water quality analysis; Brood stock quality assessment – maturity, fecundity, GSI, egg and milt quality

3. **FHM-13** **Hatchery and Seed Farm Designing** **2 (1+1)**

Theory:

Different type of hatcheries, site selection, hatchery designing, seed farm layout – water supply, hatchery unit, brood stock ponds, nursery ponds, fingerling rearing ponds, conditioning ponds, isolation ponds, quarantine ponds, overwintering ponds, feed storage, farm accessories, bio security arrangement, drainage and human resource requirements.

Practical:

Designing and layout plans for different hatcheries and seed farms as per desired production targets. Estimations of carrying capacity/production capacity, water requirements, brood stock requirement and pond area (nursery, brood stock and other ponds) requirement for a fish hatchery. Visit to different fish hatcheries, assessment and preparation of reports.

4. **FHM-14** **Fish Breeding and Hatchery Management** **3 (2+1)**

Theory:

Natural breeding, hypophysation and induced breeding of fish in captivity; pituitary gland extract for hypophysation; synthetic hormones and analogues for induced breeding; bandh breeding technology; Hatchery technology for different species (egg layers and live bearers); Spawning and hatching; Stripping methods and fertilization; Conditioning and transportation of brood-stock; use of anesthetics, disinfectants and antibiotics in fish breeding and hatchery; Care of spent brooders; Multiple breeding management; Hatchery operation and management- disinfection, water supply, water quality, handling of brood stock, eggs and larvae; Different substrates used for breeding of species producing sticky eggs - Common carp, Koi carp, Amur carp etc.; Seed demand and supply in India (Status, requirement and gaps); Hatcheries and seed supply network in India.

Practical:

Identification and selection of mature brooders. Induced breeding of Indian carps and catfishes; Collection and preservation of pituitary gland; preparation of pituitary gland extract; Calculation of dose of different inducing agents (pituitary gland extract and synthetic hormone preparations); Methods and sites for hormone injection administration, egg and milt quality assessment; Water quality monitoring in fish hatcheries; Estimation of fertilization and hatching rates; Identification of eggs and spawn of cultivable species



5. FHM-15 Nursery Pond Management and Seed Quality 2 (1+1)

Theory:

Selection of site; Layout of nursery pond; Bio- security measures; Pre stocking, stocking and post stocking management (water quality, feeding and health management) practices for new and old nursery ponds viz., eradication of insects, weeds, algal blooms, weed fish, predatory fish etc; Larval rearing technology for different species; Live food culture; Spawn, fry and fingerlings; importance of live food/plankton in larval rearing; rearing of stunted fingerlings; Seed quality and seed certification; seed grading and counting, seed packaging and transport, Seed import and quarantine procedures.

Practical:

Layout of nursery pond; preparation of nursery pond- disinfection liming and manuring, methods to control insects, weeds, algal blooms, weed fish, predatory fish etc.; preparation of larval feeds; feeding methods; plankton identification and estimation; live food culture for larval rearing; seed quality assessment – growth, survival and stress test, conditioning, grading, counting and packaging of seed; seed transport methods

6. FHM-PWS-16 Project Work and Seminar 4 (0+4)



2. Certificate Course in Aquarium Sciences

Ornamental fisheries sector is a fast-growing sector with ample scope of entrepreneurship development in Punjab and other north Indian States of the Country. Presently, the sector in the region is largely dependent on supplies from coastal states like West Bengal, Maharashtra, Andhra Pradesh, Kerala, Odisha etc. Hence, local production of potential species can serve as a much-needed filler to meet the regional demand, without long distance transport hassles leading to stock /economic losses due to mortality. PMMSY under DOF, MFAHD (GOI), is also supporting this activity to promote self-employment among skilled aspiring candidates.

The certificate course in ‘Aquarium Sciences’ will provide professional competency to candidates for placement as aquarium managers or supervisors in government and private sector aqua-houses, aquariums or hatcheries, besides offering skills to take up entrepreneurship as an ornamental fish breeder, ornamental fish trader, aquarium fabricator cum maintenance service provider and aquarium (fish and accessories) wholesaler/retailer .

Course Details

Sr. No.	Course No.	Course Title	Credit hrs.
1.	AS-11	Introduction to Ornamental Fisheries	2 (1+1)
2.	AS-12	Ornamental Fish Production, Management and Marketing	4 (3+1)
3.	AS-13	Culture of Live Food Organisms	3 (2+1)
4.	AS-14	Aquarium Fabrication, Accessories and Maintenance	3 (2+1)
5.	AS-PWS-15	Project Work and Seminar	4 (0+4)
Total			16 (8+8)

Syllabus

1. AS-11 Introduction to Ornamental Fisheries 2 (1+1)

Theory

World trade of ornamental fish and export potential; Ornamental fish farming in India- Opportunities and prospects; Constraints and strategies for sustainable development of ornamental fisheries sector; Ornamental fish culture for entrepreneurship; Trade regulations and wild life act in relation to ornamental fishes; Layout and construction of small, medium and large ornamental fish culture and breeding units; Common ornamental fish species in aquarium trade.



Practical

Identification of different ornamental fish species – indigenous and exotic, Design and layout of culture and breeding units for different ornamental fish species (egg layers and live bearers), Database generation - Ornamental fisheries in India and Punjab, Exposure visits and report submission.

2. AS-12 Ornamental Fish Production, Management and Marketing 4 (3+1)

Theory

An overview of indigenous and exotic freshwater ornamental fish species in India, Setting up of ornamental fish production facilities, Culture techniques of economically important freshwater ornamental fishes, Brood stock management, breeding and seed production of different types of ornamental fishes, Management of ornamental fish farms- Water quality management, Feed and feeding management, Health management (Prophylactics and diseases control); Conditioning, packing and transportation, Bio-security protocols, Quarantine procedures, Guidelines for green certification of ornamental fishes, Marketing strategies, Economics of different ornamental fish production units.

Practical

Layout of small-scale backyard and large scale commercial ornamental fish farms, Breeding set up for live bearer and egg layers, Water quality analysis, Formulation and preparation of supplementary feeds for ornamental fishes, disease diagnosis and treatment, Conditioning and packing of ornamental fishes, Identification of ornamental fish diseases and prophylactic measures, Exposure visits and report submission

3. AS-13 Culture of Live Food Organisms 3 (2+1)

Theory

Importance of live food for ornamental fish feeding; Different categories of live food; Identification of live food organisms; Nutritional value of live food; Culture medias; Culture techniques of live food organisms - Phytoplankton/algae (green algae, blue green algae and diatom) and Infusoria; Zooplanktons – rotifers, cladocerns and copepods; Periphyton; Tubifex, chironomids, *Artemia* or brine shrimp, earthworms etc., Bait fish and forage fish

Practical

Collection and identification of live food organisms; Qualitative and quantitative evaluation of phytoplankton, zooplankton and periphyton; Mass culture of important live food organisms –plankton, infusoria, tubifex, earthworms etc.; *Artemia* cyst de-capsulation and hatching techniques.

4. AS-14 Aquarium Fabrication, Accessories and Maintenance 3 (2+1)

Theory

Fabrication, setting up and maintenance of freshwater and marine aquarium; Use of aquarium accessories and decoration; Principles of water filtration system - biological, mechanical and chemical; Compatible species for aquaria and recommended stocking number; Types of filters, Lighting and aeration; Water quality and health management in aquarium; Aquarium fish feeds - Dry, wet and live; Conditioning and acclimatization of fish; Ornamental aquatic plants and their propagation methods for setting up of planted aquarium; different chemicals



used in aquarium management; aquarium cleaning and servicing.

Practical

Fabrication and setting up of glass aquarium with accessories; equipments and decorative material; Compatible species; acclimatization of fish and stocking; Fabrication of biological filters; Fish stocking number calculations; Thermal regulation; Water quality management; Conditioning and packing of ornamental fishes; Identification and propagation of ornamental aquatic plants; Prophylactic measures; Identification of common aquarium fish diseases and treatment; Aquarium cleaning and maintenance

5. AS-PWS-15 Project Work and Seminar 4(0+4)



3. Certificate Course in Fish Processing Technology

In view of development of shrimp farming in inland saline areas of Punjab and adjoining inland states like Haryana and Rajasthan, demand of skilled workers in processing industry is going to increase not only in coastal states, but also in North western region of the country. With every 1 ha of shrimp farming development, about 30 livelihood opportunities are generated in backward (seed, feed, medicines etc.) and forward (harvesting, marketing, trading, processing etc.) linkages, where processing holds a major share. As per latest estimates, India's total fisheries production increased to 14.16 mmt during 2019-20, with inland sector share of 10.43 mmt (73.66%) and export earnings of about ₹ 46,662 Cr. (shrimp share – about 73%). PMMSY under DOF, MFAHD (GOI), is also supporting this activity to promote self-employment among skilled aspiring candidates

The certificate course in “Fish Processing Technology” will provide professional competency to candidates for placement as processors, processing managers/supervisors in processing industry, besides inculcating entrepreneurial skills for self-employment in processing.

Course Details

Sr. No.	Course No.	Course Title	Credit hrs.
1.	FPT-11	Principles of Fish Processing and Preservation	1 (1+0)
2.	FPT-12	Operation and Maintenance of Fish Processing Unit	2 (1+1)
3.	FPT-13	Fish Processing and Value Addition Techniques	4 (2+2)
4.	FPT-14	Fish Waste Processing and Utilization	3 (2+1)
5.	FPT-15	Fish Quality Standards and Marketing Strategies	2 (1+1)
6.	FPT-PWS-16	Project Work and Seminar	4(0+4)
Total			16 (7+9)

Syllabus

1. FPT-11 Principles of Fish Processing and Preservation 1 (1+0)

Theory:

Composition and nutritional value of fish. Changes in fish after death, spoilage, rigor mortis. Fish handling for processing and preservation. Introduction to traditional methods of fish processing and preservation. Principle behind preserving the fish by salting, sun drying, smoking, marinating, fermentation/pickling. Principle behind preserving the fish through pickling. Modern methods of fish processing and preservation. Principle of fish preservation by modern methods - freezing, canning, retort pouching. Importance of packaging in fish processing, functions, objectives and requirements.



2. FPT-12 Operation and Maintenance of Fish Processing Unit 2 (1+1)

Theory:

Processing plant layout designing. Sanitation and plant housekeeping procedure. Refrigeration plant layout designing and construction. Insulating materials used for the cold storage construction. Estimation of cold storage capacity for frozen products, usage of Ante-room. Components of refrigeration cycle – Compressor, evaporator, compressor, expansion valve. Classification of refrigerants. Study of different types of freezers – air blast freezers, plate freezers, immersion freezers, cryogenic freezers. Operation of de-boning machine, ice flecking machine, band saw, bowl chopper, meat mincer, vacuum/ aerobic packaging machine, sausage filler. Heat penetration studies, mechanism of heat transfer. Cold spot and its importance, convection and conduction type of packs. Process calculation by general/graphical methods. Commercial sterilization, 12-D concept.

Practical:

Chilling and freezing equipment operation. Study of freezing and thawing curves; freezing of different varieties of fish and shellfish. Estimation of drip loss. Determination of quality changes during frozen storage. Inspection of frozen fishery products. Visits to ice plants, cold storages and freezing plants. Types of cans, canning equipments and layout of cannery. Cut out test of canned products. Examination of can double seam. Heat penetration in canned food, thermal process calculation by general method.

3. FPT-13 Fish Processing and Value Addition Techniques 4 (2+2)

Theory:

Preservation of fish through salting, methods of salting–wet and dry salting; Theory of drying and dehydration; Sun drying and artificial drying of fish; Packaging and storage of salted and dried fish; Different types of spoilage in salt cured fish; Quality standard for salted and dry fish; Fish preservation by smoking- chemical composition of wood smoke and their role in preservation; Methods of smoking and equipments used for smoking; fish filleting and fish streaks; Marinated and fermented fish products (Fish/shellfish pickles, fish sauce, fish paste); Value added and diversified fish products from fish mince/meat like fish finger, fish cutlet, fish balls, fish nuggets, fish wafer, fish soup powder and protein concentrate; Fish extruded/Imitation products (Fish sausage, fish ham, surimi, fish cake etc.) and functional products (fish protein supplemented products). Packaging methods.

Practical:

Preparation of salted, dried and smoked fish by different methods; Quality assessment of salted, dried and smoked fish; fish filleting and streak making; Preparation of fish and shrimp/prawn pickles; Preparation of surimi and surimi-based products; Preparation value added fish products- fish fingers, balls, nuggets, cutlets, sausages, samosa etc; Quality assessment and sensory evaluation of fish products. Packaging of products

4. FPT-14 Fish Waste Processing and Utilization 3 (2+1)

Theory:

Dry and wet reduction methods for fish meal preparation, its specification, packaging and storage; Fish oil extraction, purification, preservation; storage methods and its application; Chitin – chitosan extraction method and its uses; Extraction methods of Fish protein



concentrate (FPC); Fish hydrolysate, partially hydrolyzed and deodorized fish meat; functional fish protein concentrate and their incorporation to various products; Fish silage preparation through acidification and fermentation methods and its application; Fish leather, fish maws, fish glue, fish gelatin and isinglass preparation techniques; Biochemical and pharmaceutical products extracted from fish waste.

Practical:

Preparation of economic byproducts from fish processing waste like Fishmeal, bone meal, fish oil, fish maws, fish silage, fish gelatin, chitin, chitosan, fish manure, fish silage, isinglass, fish protein concentrate and fish hydrolysate.

5. FPT-15 Fish Quality Standards and Marketing Strategies 2 (1+1)

Theory:

Sources and types of microorganisms in fish and fishery products; Pre-harvest and postharvest factors affecting fish quality; Food laws and standards, national and international legislation, mandatory and non-mandatory standards; Role of export inspection council & export inspection agency and MPEDA in fish and fishery products; Legislation for export quality assurance in India; Certification system for fish & fishery products; Role of HACCP in safe products production; Requirement and procedure for the registration and licensing; Fish marketing strategies and current trends.

Practical:

Sampling and processing of samples for microbiological investigation; Assessment of quality of fresh fish by sensory, biochemical, and instrumental methods; Assessment of fish product texture using texture analyzer; Quality analysis of canned, frozen, cured and pickled fish products; Quality tests for tin and corrugated containers; Assessment of plant, equipment sanitation and personnel hygiene; Detection of filth and extraneous matter in traditional processed products.

6. FPT-PWS-16 Project Work and Seminar 4 (0+4)



4. Certificate Course in Aqua-Clinics

With enhanced awareness about bio-security, sustainability and food safety concerns, more emphasis is being given to the concept of ‘Aqua-Clinics’ to provide a continuous utility service in health management, especially to shrimp farmers, so as to prevent stock loss due to disease outbreak and produce export quality product for higher economic gains. PMMSY under DOF, MFAHD (GOI) is also supporting this activity to promote self-employment among skilled aspiring candidates

The proposed certificate course in ‘Aqua-Clinics’ will provide professional competency to candidates for placement as Lab Technician, Lab Assistant or Lab Supervisor in public or private aqua-clinics, besides offering skills to take up aqua-clinics for self-employment.

Course Details

Sr. No.	Course No.	Course Title	Credit hrs.
1.	AC-11	Introduction to Aqua Clinical Techniques	3 (1+2)
2.	AC-12	Soil and Water Quality Testing and Management in Aquaculture	3 (1+2)
3.	AC-13	Fish Disease Diagnosis and Management	3 (2+1)
4.	AC-14	Therapeutics in Aquaculture	2 (1+1)
5.	AC-15	Health Certification in Aquaculture	1 (1+0)
6.	AC-PWS-16	Project Work and Seminar	4 (0+4)
Total			16 (6+10)

Syllabus

1. AC-11 Introduction to Aqua Clinical Techniques 3 (1+2)

Theory

Introduction to microbiology. Types of Microorganisms – bacteria, viruses, fungi and protozoa etc. Microbial growth and factors affecting growth. Microbial Techniques- microscopy, culture medias, sterilization, culture and staining techniques, enumeration of micro-organisms, culture preservation methods etc., Biochemical tests for bacterial identification. Antimicrobial susceptibility testing. Molecular Biology Techniques: DNA isolation from microbes, DNA and RNA quantification methods, Polymerase chain reaction (PCR), Real-Time PCR, Electrophoresis. ELISA, SDS-PAGE, Dot blot

Practical

General laboratory and safety instruction. Introduction to laboratory equipments. Handling of microscopes, Wet mount, smear and hanging drop preparations. Tools and techniques in sterilization methods: Filtration, dry heat, moist heat, chemical agents; Cultivation technique: Media preparation, Isolation -pure culture, subculture. Observation of fungi, blue-green algae, and protozoans. Staining techniques for bacteria– simple, differential, structural and Biochemical tests: Indole, methyl red, Voges Proskauer, citrate test, oxidase test, catalase



tests. Collection of water and sediment samples for microbiological analysis. Molecular biology techniques - PCR, real time PCR, ELISA, SDS-PAGE, dot blot etc.

2. AC-12 Soil and Water Quality Testing and Management in 3 (1+2) Aquaculture

Theory

Concepts of acid, base, salts, hydrogen ions, pH and buffer. Preparation and dilution of standard solutions, Concepts of analytical chemistry - volumetry, titrimetry, conductometry, refractometry, colorimetry and turbidimetry. Water molecule, properties of pure water, surface water, ground water and sea water. Collection and preservation of water samples. Water quality analysis- transparency, turbidity, pH, electrical conductivity, salinity, total solids, dissolved oxygen (DO), free carbon dioxide (CO₂), total alkalinity, total hardness, sodium, potassium, calcium, magnesium, carbonates, bicarbonates, chloride, sulphate, fluoride, inorganic nitrogen (ammonium and nitrate), phosphorus and microbial load. Water quality requirements and management in aquaculture. Soil characteristics: origin and nature of soils. Physical properties of soil; soil color, soil texture, soil structure, pore size, bulk density, water holding capacity. Soil types and their distribution. Soil quality analysis- pH, salinity, EC, organic carbon, C/N ratio, NPK etc., Soil and water amendments: application of lime, manures, fertilizers, micronutrients, zeolites, alum, gypsum, disinfectants, probiotic formulations etc.,

Practical

Principles of titrimetry, gravimetry, potentiometry, conductometry, refractometry, colorimetry, turbidimetry, spectrophotometry (UV, Visible, Flame, AAS), Demonstration: laboratory glass wares and equipment used in water and soil analysis. Hands on training in water quality analysis - transparency, turbidity, pH, EC, salinity, total solids, DO, free CO₂, total alkalinity, total hardness, sodium, potassium, calcium, magnesium, carbonates, bicarbonates, chloride, sulphate, fluoride, inorganic nitrogen (ammonium and nitrate), phosphorus, microbial load etc. and Soil quality analysis - soil texture, pH, salinity, EC, organic carbon, C/N ratio, NPK etc.

3. AC-13 Fish Disease Diagnosis and Management 3 (2+1)

Theory

Significance of fish diseases and health management in aquaculture. Defence mechanisms of finfish and shellfish. Disease development process in finfish and shellfish. Role of stress and host defense response in disease development. Pathological process in diseased animal. Common infectious diseases of aquatic organisms (carps, pangas, tilapia, prawn, shrimp, ornamental fish etc.) - causative agents, clinical signs, prevention and treatment. Non-infectious and nutritional diseases. OIE listed diseases, Importance of case history and clinical sign in fish disease diagnosis. Disease diagnosis methods: Microscopical, microbiological, histopathological, biochemical, antibody and nucleic acid based methods, Health management strategies in Aquaculture - vaccines, immuno-stimulants, bioremediation, probiotics, best management practices (BMPs), SPF and SPR stocks, bio-security principles, Disease control through environmental management, Crop rotation and poly-culture as strategies for health management.



Practical

Methods of sampling fish and shellfish for disease diagnosis. Live and post mortem examination of fish and shellfish. Pathology and histopathology of organs systems. Taxonomy, lifecycle and identification of fish and shellfish parasites. Microscopic diagnosis of fish and shellfish parasites. Finfish and shellfish hematology. Microbiological, histopathological, immunological and molecular biology methods of disease diagnosis. Agglutination test. Challenge test.

4. AC-14 Therapeutics in Aquaculture 2 (1+1)

Theory

History and classification of chemotherapy; Chemicals of therapeutic value, Status and scope of therapeutics in aquaculture; Commonly used therapeutics in aquaculture - Antibiotics, pesticides, fungicides, algacides, hormones, anesthetics, disinfectants, sanitizers etc.; Antibiotics in aquaculture - Antibiotic resistance and residues; Antiseptics/disinfectants/sanitizers in aquaculture; Anti-parasitic drugs, immuno-stimulants and vaccines in aquaculture. Herbal supplements for health management in aquaculture, Therapeutic drug formulation for aquaculture - Principles, action mechanism, drug leaching, stabilizers and binders; flesh color enhancers, Low priority aquaculture drugs, banned/restricted drugs in aquaculture, food safety, traceability and eco-labeling.

Practical

Regulation of drug and chemicals usage in aquaculture. Generic name, patent name, dosage and indications of various aquaculture drugs used in fish health. Determination of Minimum inhibitory concentration (MIC). Antimicrobial susceptibility testing. Preparation of therapeutic solution of different drugs/chemicals and calculation of dosage requirement in aquaculture pond. Treatment tips - chemical selection, treatment rates, treatment measures, treatment units, active ingredient, treatment methods and timing of treatment. Determination of volume of ponds, tanks and raceways for application of therapeutics.

5. AC-15 Health Certification in Aquaculture 1 (1+0)

Theory

Health certification and its importance in aquaculture. OIE listed diseases. Disease surveillance and reporting. Disease zoning. Quarantine and health certification - General principles of quarantine, procedures for quarantine of aquatic animals in aquaculture production facilities, brood stock and seed quarantine measures, standards of construction, security and operation for quarantine facilities, use of disinfectants, antibiotics and other chemicals and drugs in quarantine facilities. Quarantine practices and standards in Asia. Bio-security principles, SPR and SPF. Trans-boundary movement of aquatic animals - import and export risk assessment, pathogen transfer, testing and certification, contingency planning, International conventions and codes of practice. Sanitary and phytosanitary Agreement. Good and Best management practices. Role of Quarantine in National and Regional Bio-security.

6. AC-PWS-16 Project Work and Seminar 4 (0+4)



IV. (ii) DETAILS OF SHORT COURSES

Annexure - II

I. Short Course in Aquarium Fabrication and Maintenance

Ornamental fisheries sector is a fast-growing sector with ample scope of entrepreneurship development in Punjab and other north Indian States of the Country. Skill development in the field of aquarium fabrication and maintenance will help in developing an indigenous market for the growing demand in the said field, which is presently largely dependent of supply of modular aquaria from China.

Course Contents

Theory	Practical
<p>Unit –I Introduction to aquarium science; Fabrication, setting up and maintenance of different types of fish aquaria; Aquarium accessories (Aerators, Filters, Thermal control and Decorative Articles); Introduction to aquatic plants for setting up natural planted aquaria</p> <p>Unit -II Ideal ornamental fish species combination and fish density for different sizes of aquaria; Conditioning and acclimatization of fish; Fish transfer to aquarium; Water quality management; Aquarium fish feeds and feeding strategies</p> <p>Unit –III Health management; Disease diagnosis and treatment; Different chemicals used for aquarium management; Aquarium cleaning and servicing.</p>	<ul style="list-style-type: none"> • Fabrication and setting up of glass aquarium with accessories and decorative material • Fabrication of different types of filters • Identification of important ornamental fish species • Fish density calculations as per aquarium size • Acclimatization, conditioning and introduction of fish in aquarium • Identification, handling and fixing of ornamental aquatic plants in aquarium • Water quality monitoring and analysis • Conventional and Non-Conventional ornamental fish feeds • Prophylactic measures for aquarium management • Identification of common aquarium fish diseases and treatment • Aquarium cleaning and maintenance



II. Short Course in Fish Feed Formulation and Manufacturing

With expansion of aquaculture (fish/shrimp) activities in the region, small scale fish feed mills are being established in the northern part of the country in public/ private sector. In future, large scale fish/shrimp feed production is likely to develop and invite industrial investment in the region. Subsequently, demand for skilled human resource (feed mill operator/supervisor) is going to increase.

Course Content

Theory	Practical
<p>UNIT I</p> <p>Introduction to fish nutrition - Concepts and terminologies; nutritional requirements of different stages of important cultivable fish and shellfish species - larvae, juveniles and brood stock.</p> <p>UNIT II</p> <p>Introduction to conventional and non-conventional fish feed ingredients; Nutritional value of feed ingredients; Feed additives - Attractants, herbs, vitamins, probiotics, binders, pigments etc.</p> <p>UNIT III</p> <p>Formulation of feeds for different fish (carps and catfishes) and shellfish (shrimp and prawn) species; Introduction to feed mill; Handling and operation of feed mill; Manufacturing of different types of feeds; Feed packaging and storage.</p>	<ul style="list-style-type: none">• Identification of conventional and non-conventional feed ingredients• Formulation of feeds for different fish (carps and catfishes) and shellfish (shrimp and prawn) species• Feed mill handling and operations - grinding, mixing, pelleting and drying• Preparation of different types of feeds – Mash feed, Pellet feeds (sinking and floating pellets), wet feeds etc.• Feed packaging and storage• Feed quality assessment



V. IMPORTANT NOTES REGARDING ADMISSION

- (i) For admission, candidates will be considered strictly on the basis of merit/marks of qualifying examination. However, preference will be given to B.F.Sc. graduates for certificate course. In case two or more candidates are obtaining equal marks in the qualifying examination, the preference will be given to the candidate older in age.
- (ii) Change, if any, in application submission dates and the counselling dates will be notified on the university website only. The aspirants are advised to visit the university website www.gadvasu.in regularly for the updates.
- (iii) The admission to both the courses are open to residents of all states and union territories of India.
- (iv) The admission form is available on the University website www.gadvasu.in. The candidates seeking admission have to download the application form, fill offline and submit along with all required documents and proof of payment of application fee as scanned single pdf file attachment through email to deancofpb@gmail.com in order to reach the Office of Dean, College of Fisheries, Ludhiana on or before the last date fixed for receipt of the application form.
- (v) **Application fee** can be deposited through “Demand Draft” favoring Comptroller GADVASU, Ludhiana or through “Bank Transfer” as per account details given below:

Beneficiary Name	COMPTROLLER, GADVASU
Beneficiary Account No	50100094320540
Beneficiary Bank	HDFC Bank Ltd, Feroze Gandhi Market, Ludhiana
Beneficiary Bank IFSC Code	HDFC0000634
Beneficiary Bank Swift Code	HDFCINBBXXX

- (vi) The candidates seeking admission must attend the counselling (in person or online) as per the scheduled date, time and venue notified on the university website. No separate call/invitation will be made to the candidate for counselling.
- (vii) At the time of counselling, the candidate is required to present the hard copy of the submitted application form and the original certificates.
- (viii) The candidates selected for admission will have to pay the entire fee immediately after counselling through Credit Card/Debit Card/Cash or through “Bank Draft” favoring DEAN, COLLEGE OF FISHERIES, payable at any scheduled bank in Ludhiana. In case of online counselling, the entire fee must be deposited within 24 hours of admission through “Bank Transfer” in the account of DEAN, COLLEGE OF FISHERIES as per details given below:

Beneficiary Bank	HDFC Bank
Beneficiary Bank Address	HDFC Bank Ltd, Feroze Gandhi Market, Ludhiana
Beneficiary Bank IFSC Code	HDFC0000634
Beneficiary Name	DEAN, COLLEGE OF FISHERIES
Beneficiary Account No.	50100422971742



- (ix) The university possesses no boarding facilities for the candidates taking admission in both the course. So, they have to arrange accommodation at their own level.
- (x) The reservation policy will be followed as per guidelines of the state government and as in other programmes of the university.
- (xi) The in-service candidates deputed by the employer will be given preference in admission.



VI. ACADEMIC CALENDARS FOR CERTIFICATE COURSES (2022-23)

Fish Processing Technology

Activity	Date
Meeting with advisors and registration	19-09-2022
Commencement of classes	20-9-2022
Last date for registration with the permission of the Dean	27-9-2022
Mid-Semester Examination	4-12-2022 to 13-12-2022
End of Semester Examination	7-2-2023 to 17-2-2023
Submission of grades by the Teachers to Head	22-2-2023
Submission of grades by the Head to the Dean	27-2-2023
Announcement of result by the Dean	3-3-2023
Supplementary Examination	9-3-2023 to 11-3-2023
Submission of grades of supplementary Examination by the Head to Dean	15-3-2023
Announcement of result of Supplementary Examination	20-3-2023
Total Number of Days	141
Total Number of Working Days	93

Note: If any of the above days happens to be a holiday, the next working day will be considered for that particular activity except for the examination (s) which will be held on the prescribed day(s)



Aquarium Sciences / Aqua-Clinics

Activity	Date
Meeting with advisors and registration	15-02-2023
Commencement of classes	16-02-2023
Last date for registration with the permission of the Dean	22-02-2023
Mid-Semester Examination	24-04-2023 to 05-05-2023
End of Semester Examination	30-06-2023 to 10-07-2023
Submission of grades by the Teachers to Head	14-07-2023
Submission of grades by the Head to the Dean	18-07-2023
Announcement of result by the Dean	20-07-2023
Supplementary Examination	01-08-2023 to 04-08-2023
Submission of grades of supplementary Examination by the Head to Dean	10-08-2023
Announcement of result of Supplementary Examination	14-08-2023
Total Number of Days	135
Total Number of Working Days	89

Note: If any of the above days happens to be a holiday, the next working day will be considered for that particular activity except for the examination (s) which will be held on the prescribed day(s)



Fish Hatchery Management

Activity	Date
Meeting with advisors and registration	05-04-2023
Commencement of classes	06-04-2023
Last date for registration with the permission of the Dean	12-04-2023
Mid-Semester Examination	15-06-2023 to 24-06-2023
End of Semester Examination	14-08-2023 to 23-08-2023
Submission of grades by the Teachers to Head	28-08-2023
Submission of grades by the Head to the Dean	04-09-2023
Announcement of result by the Dean	11-09-2023
Supplementary Examination	15-09-2023 to 18-09-2023
Submission of grades of supplementary Examination by the Head to Dean	25-09-2023
Announcement of result of Supplementary Examination	29-09-2023
Total Number of Days	131
Total Number of Working Days	93

Note: If any of the above days happens to be a holiday, the next working day will be considered for that particular activity except for the examination (s) which will be held on the prescribed day(s)



Admission ID No.

For office use only

VII. APPLICATION FORM

**COLLEGE OF FISHERIES, GADVASU, LUDHIANA
FOR
ADMISSION TO CERTIFICATE COURSE / SHORT COURSE
(Academic Session 2022-23)**

IMPORTANT: The candidate must carefully read instructions given at the end of this form and in the prospectus available on the university website (www.gadvasu.in) before filling the form.

FOR OFFICE USE ONLY				
Last Exam. passed	Year of Passing	Name of Board/ University	Marks/ OGPA/ OCPA obtained	%age of marks

Category under which seeking admission.....
Documents lacking.....
Checked by..... Re-checked by.....
Fees paid

Cashier..... A.A.O.....
DD. No. Dated.....
Admission No.
Dealing Official.....

Latest passport size photograph pasted with gum duly signed by the candidate.
Do not staple

Detail of Application Fee (To be filled in by the candidate)

Amount:
Transfer Ref. No.:
Date:
Bank, Branch, City:

(Application Fee)

- Rs. 1000/- for Certificate
- Rs. 500/- for Short Courses

(to be paid through Demand Draft/Bank Transfer.)

To be filled by the candidate in his/her own handwriting with blue/ black ink

Aadhaar / UID number

EPIC Number

1. Name of the applicant* (in block letters) _____
2. Father's name* (in block letters) _____
3. Mother's name* (in block letters) _____
4. (a) Permanent Address _____

PIN _____

(b) Correspondence Address _____

PIN _____

(c) Mobile No. _____

(d) E-mail _____

*Name as mentioned on qualifying degree certificate/D.M.C.

Contd.....



5. Programme in which admission is sought (Fill in the name of certificate/short course)
- 1. Certificate Course in _____
 - 2. Short Course in _____
6. Country, State, Place of residence _____
7. Date of Birth _____
(As entered in the matriculation or equivalent certificate).
8. Nationality _____
9. Religion _____
10. (a) Name of father or guardian with relation _____
(b) Occupation of father/guardian _____
(c) Annual income of family _____
(d) Address of father/guardian _____

12. Have you ever been dropped/expelled/rusticated or denied admission to any school or college? If yes, give detailed reasons and period of dropping/expulsion/rustication _____

13. Have you ever been found guilty of adopting unfair means in any examination or disqualified/barrred from appearing in any examination conducted by any Board/University? If yes, give details. _____

Contd....



14. Details of qualifying examinations passed

Examination	Matriculation	10+2	Graduation	Post-graduation
Name of School or College				
Name of the Board/University				
Month and Year of Passing				
Board/University Roll No.				
Maximum Marks/OGPA/OCPA				
Marks/OGPA/OCPA obtained				
Percentage of Marks				
Medium of Instruction				
Subjects				

DECLARATION BY CANDIDATE

- I _____ son/daughter of Sh. _____ hereby certify that the admission form has been filled in my own hand-writing with blue/black ball point and according to the given instructions.
- I hereby affirm that the information given by me in this admission form is complete and true to the best of my knowledge and belief and that I have made this application with the consent and approval of my parent/guardian. In the event of my admission to the college, I undertake to abide by the disciplinary and other rules and regulation of the college and the university.
- If the information provided by me is found to be incorrect, I will be liable to be prosecuted under law and summarily expelled from GADVASU.

Place _____

Date _____

(Signature of candidate)



DECLARATION BY PARENT/GUARDIAN

I _____ do hereby declare that my son/daughter/ward _____ makes this application with my knowledge and consent and that in the event of his/her being admitted to the college, I shall be responsible for his/her good conduct and for the due and prompt payment of college and other fees and to indemnify the College/University in respect of all losses and the expenses resulting from delay and failure to make any such payment or as a result of the particulars given above proving incorrect.

(Signature)

Place _____

Name _____

Date _____

Relation with candidate _____

Address _____

Contd...

DECLARATION BY CANDIDATES WILLING TO DONATE THEIR EYES

I want to pledge my eyes for eye donation after my death. My family members also support my decision. This is to certify that the above said information given by me is accurate and I know that my name will be displayed in the list of eye donors on the official website as I have chosen to pledge my eyes.

Agree	Disagree
-------	----------

Tick the appropriate choice

Signature of Candidate

Signature of Parent/Guardian



INSTRUCTIONS

1. The Candidate must ensure his/her eligibility before filling up the form.
2. The admission form must be filled legibly in blue/black ball point in candidate's own handwriting. The hard copy must be submitted in person at the time of counselling.
3. Latest passport size photograph signed by the candidate should be pasted in the space provided on the admission form. This photograph should be similar in all respects as the candidate wishes to appear in the counselling. For example, if the candidate wishes to appear with beard, turban, etc., the photograph should appear so.
4. The admission form must be complete, and no column should be left blank. Write "Not Applicable" where no information is required to be given. Incomplete admission form is liable to be rejected.
5. Information at Sr. No. 5 of Application Form must be filled, otherwise, the application form will be considered incomplete and rejected.
6. Self-attested copies of all the certificates from matriculation onward and other supporting testimonials must be attached with the admission form in the first instance. No addition of certificate/testimonial shall be entertained subsequently.
7. The DEAN, COLLEGE OF FISHERIES may, at his/her discretion, cancel the admission of a candidate if at any time, it is found that the candidate obtained admission by misrepresentation/concealment of facts or the admission was made due to any error, oversight etc.
8. INCOMPLETE APPLICATIONS / APPLICATIONS WITHOUT REQUISITE FEE / APPLICATIONS RECEIVED AFTER THE PRESCRIBED DATE WILL NOT BE ENTERTAINED UNDER ANY CIRCUMSTANCES. NO CORRESPONDENCE/ENQUIRY FROM SUCH CANDIDATES SHALL BE ENTERTAINED.

List of Self Attested copies of Certificates/Testimonials to be submitted with

Admission Form

1. Declaration of Parents/ Guardian (as per prescribed format)
2. Certificate of residence
3. Certificate as evidence of Date of Birth
4. Degree and Detailed marks certificate of examination(s) which qualifies the candidate for admission
5. Character certificate from the college/ university last attended
6. Aadhaar/UID card.
7. Election Photo Identity Card (EPIC). The candidates who don't have EPIC card must apply for the same at the website of Election Commission of India as per FORM-6.

Note: Original certificates/testimonials, Aadhaar card, EPIC etc., self-attested copies of which have been enclosed with the admission form should be produced at the time of counselling.



COLLEGE OF FISHERIES
GURU ANGAD DEV VETERINARY AND ANIMAL SCIENCES UNIVERSITY
LUDHIANA, PUNJAB (141001)

Contact: 0161-2414061