## Teaching and Examination scheme

<table>
<thead>
<tr>
<th>Theory Paper /Practical</th>
<th>Teaching schedule Hrs/week</th>
<th>Exam Schedule</th>
<th>Total marks Theory/Practical</th>
<th>Credit</th>
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<td></td>
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<td>Duration (hrs)</td>
<td>Internal marks</td>
<td>Theory / Practical (Unì)</td>
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<td><strong>Theory papers :</strong></td>
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<tr>
<td>AQB: 401 – Fish Diseases and Management</td>
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<td>3</td>
<td>30</td>
<td>70</td>
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<tr>
<td>AQB: 402 – Animal Aquaculture I</td>
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<td>3</td>
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<td>70</td>
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<tr>
<td>AQB: 403 – Animal Aquaculture II</td>
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<tr>
<td>AQB: 404 – Plant Aquaculture</td>
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<td><strong>Practicals :</strong></td>
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<tr>
<td>AQB: 405 – Aquaculture Management</td>
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<td>70</td>
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<tr>
<td>AQB: 406 – Placement and Training</td>
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<td>180</td>
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Veer Narmad South Gujarat University, Surat  
M.Sc. (Aquatic Biology) Semester – IV  

Syllabus  

AQB : 401 - Fish Diseases and Management  

Unit – I  

Etiology: Physical, chemical and physiological factors in fish diseases,  
Techniques for diagnosis of diseases  
Therapy of fish diseases: mode of drugs action, Administration of drugs, Use of  
Antiparasitic, Narcotics, Sedatives, Disinfectants and Chemotherapy of fish  

Unit – II  

Pathogenic diseases: Symptoms and their control – Fungal, Bacterial and Viral diseases  

Unit – III  

Parasitic diseases: Symptoms and their control – Protozoan, Crustacean, and Worm  
diseases  

Unit – IV  

Non Pathogenic diseases: Symptoms and their control – Algal, Environmental, Nutritional  
and Hereditary diseases  

Hrs 16  

Hrs 10  

Hrs 8  

Hrs 6
References:

- Austin, B. (1999): Bacterial fish pathogen-Disease of farmed and wild fish, Paraxis publishing Ltd., U.K
- Duijn, C.V. (2000): Diseases of fishes, Narendra publishing house, Delhi
- Roberts, R.J. (1978): Fish pathology, Bailere Tindall, Landon
- Wedemeyer, G.K. (1999): Environmental stress and fish diseases, Narendra publishing house, Delhi
AQB : 402 – Animal Aquaculture I

Unit – I

Definition, history and scope of aquaculture, constraints and recent advances in aquaculture, criteria for selection of species in aquaculture

Unit – II

Selection of site, designing, layout and construction of aquafarms, types and properties of soil, water supply and drainage systems, aeration in aquaculture, equipments and feeders
Role of Birds and mammals in aquaculture

Unit – III

Carp culture: Preparation of nursery, rearing and stocking ponds, Fertilization, Stocking, Supplementary feeding and harvesting
Composite fish culture
Integrated fish farming
Culture of Murrel

Unit – IV

Culture of freshwater prawns
Culture of catfishes
Trout culture: types of trouts, culture systems, development of brood stock, techniques of propagation and rearing of growouts
Sewage fed fisheries: sewage, treatment, sewage fed fish culture in India
References:

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Syllabus

AQB : 403 – Animal Aquaculture II

Unit – I Hrs 10

Brackishwater finfish culture: Introduction, culture system, harvesting and marketing of important brackishwater fin fish (Mullet, Milk fish and Seabass)

Unit – II Hrs 8

Brackishwater Prawn culture, Types of prawns, Preparation and management of prawn farm (water quality, Stocking, feeding, diseases, harvesting and marketing), bio-security and effluent treatment plant in prawn farming

Unit – III Hrs 12

Mariculture: History and recent advances in mariculture.
Edible oyster culture, Pearl oyster culture, techniques of pearl production
Lobster and Clam culture

Unit – IV Hrs 10

Ornamental fish culture: Status of Ornamental fish trading in India, Design and construction of aquaria, Settingup and management of aquarium
Equipments used in aquaria (Biological filters, aerators, heaters etc.)
Breeding and culture of ornamental fishes.
Transportation of ornamental fishes
References:

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Syllabus

AQB : 404 – Plant Aquaculture

Unit-1

Plant aquaculture: History, principles, scope and importance.
Important cultivable species of aquatic plants and sea weeds, micro algae

Unit-2

Biodiversity of Seaweeds along the coast of India and Gujarat,
Taxonomy of economically important seaweeds.
Distribution, morphology, reproduction, life cycle, growth physiology and Culture
techniques of sea weeds (Gracilaria, Ulva)
Products from seaweeds

Unit-3

Biodiversity of freshwater higher vascular plants in India and Gujarat,
Taxonomy of economically important freshwater higher vascular plants.
Distribution, morphology, reproduction, life cycle, growth physiology and Culture
techniques of freshwater higher vascular plants (Trapa, Typha), products of higher vascular
plants
Reed bed technology in waste water treatment

Unit-4

Biodiversity of micro algae in India and Gujarat
Taxonomy of economically important micro algae.
Distribution, morphology, reproduction, life cycle, growth physiology and Culture
techniques and Importance of Spirulina and chlorella
Application of microalgae in water treatment and Bioremediation
References

Veer Narmad South Gujarat University
Department of Aquatic Biology

M. Sc. (Aquatic Biology) Semester – IV

Syllabus (Practical)

AQB : 405 – Aquaculture Management

- Preparation of media
- Isolation and identification of pathogenic bacteria from fish.
- Study of permanent slides (pathogens and parasites).
- Study of diseased specimens.
- Identification of seaweeds, higher vascular plants.
- Identification of cultivable fin fishes, shell fishes, predatory and weed fishes.
- Identification of seed stages (eggs, spawns, fry and fingerlings).
- Identification of aquatic insects and prawn larvae.
- Identification of aquatic weeds (marine and fresh water).
- Setting of an aquarium
- Visit to aquafarms
Veer Narmad South Gujarat University  
Department of Aquatic Biology  
M. Sc. (Aquatic Biology) Semester – IV  

Syllabus (Practical)  

AQB : 406 – Placement and Training

Under this practical programme each student has to join and work in an aquafarm / aquaindustry or organisation working in the field(s) Aquatic Biology mentioned in syllabus, minimum for two weeks during the second year. The aim of this programme is to enhance confidence of student, gain practical knowledge and experience of the subject and getting better chance for employment.

The placement agency is expected to send the report of student related to his/her performance, ability, attendance punctuality and interest at the end of the programme.

Simultaneously, student also has to submit the report for his/her experience and feedback. The agency’s report will be considered at the time of practical exam. Practial exam for this will carry the same weightage of marks. In exam the reports of the placement agency and student would be considered and would be followed by viva voce.

Expenditure during this programme would exclusive be borne by the student. The Department or the university will not bear any cost. However stipend or financial help from other sources would be accepted and appreciated.