

COURSE GUIDEBOOK

Department: Biology	Module Code: 09
Module Title: Fisheries and aquatic sciences	Module Credit: 6
Course Title: Aquatic Science and Wetland Management	Course code: Biol3091
Credit: 2 (2 theoretical classes/week)	Credit Point (ECTS): 3
Instructors name: Adem Mohammed (Assit.Prof.)	Mode of delivery: Block I
Instructors contact information:	
Office:	Academic year: 2020
Phone:	Semester: II
Email: ade2010moha@gmail.com	Class schedule: Monday and Tuesday
Office hours:	Venue:
Target Group: 3rd Year second Semester	Course Category: Compulsory/ core
Pre-request: None	

1. Course Description:

The course deals with aquatic ecosystems of the world. Marine and inland water ecosystems; the definition of marine water, freshwater, lives in marine and freshwater, phytoplankton, zooplankton, different fish fauna in the world with special emphasis on Ethiopian fauna, chemical, biological, and physical water quality analysis; description of wetlands, aquatic (freshwater) systems and their catchments, major wetlands of the world, the wetland ecosystem, threats to wetlands and freshwater, conservation of freshwater and wetlands, international treaties and conventions on wetland and freshwater conservation.

2. Course Objective: After successful completion of this course a student will be able to:

- define inland water, freshwater and marine water
- describe biotic resources of the world aquatic ecosystem such as fish resources
- discuss contribution of wetlands to the wellbeing of animals in the area
- analyze water quality using different methods
- participate in community water conservation and pollution control activities
- discuss on international treaties on wetland and freshwater ecosystems such as the Ramsar Convention and the Nile Basin Initiative

3. Student work load

Activity breakdown	Lecture	Field trip and report	Independent Reading	Total
Hours	32	20	29	54

4. Tentative Course Schedule:

Week	Conceptual focus (content)	Readings/Assignments
01	1. Introduction (2 hrs) 1.1. Marine ecosystems (oceans, seas and estuaries) 1.2. Inland aquatic ecosystems (lentic, lotic waters, wetlands)	4,5 and 6
02	2. Major freshwater bodies and wetlands of Ethiopia (4 hrs) 2.1. Lakes 2.2. Rivers 2.3. Wetlands Test I=15%	4,5 and 6
03-04	3. Aquatic ecosystems (6 hrs) 3.1. Community structure 3.2. Identification of organisms 3.3. Functional feeding group 3.4. Allochthonous and autochthonous inputs 3.5. Habitat zonation 3.6. Marine ecology 3.7. River and lake ecology 3.8. Wetland ecology	1,4,5 and 6
05	4. Water pollution (5 hrs) 4.1. Types of aquatic pollution 4.2. Toxic substances, suspended solids (inert and oxidizable, deoxygenation, nontoxic salts (including salinization, eutrophication and algal toxins) 4.3. Addition of heated water, effect on buffering system; 4.4. Afforestation and water quality 4.5. Micro-organisms and pollution control (Nutritional classification; Microbial oxygen demand (inc. self-purification, oxygen balance, re-aeration, the oxygen-sag curve; the BOD test. Test II=15%	2 and 3
06	5. Water quality assessment (4 hrs) 5.1. Physico-chemical and biological surveillance 5.2. Sampling surface waters (inc. designing sampling programmes, mixing, safety in the field, hydrological measurements; chemical and biological sampling), Biological data (inc. pollution and diversity indices; limitations of indices; multivariate analysis), Chemical data (inc. chemical indices; mass balance and modeling	2 and 3
07	6. Aquatic ecosystems and their catchments (2 hrs) 6.1. Catchment size and form 6.2. Catchment soils and vegetation 6.3. Catchment and the water body	4,5, and 6

	7. Aquatic resources (Fish and fisheries): The Ethiopian fish and fisheries-classification and importance (2 hrs) Quiz=5%	
08	8. Water basin management and monitoring (3 hrs) 8.1. Basic management and monitoring programs 8.2. Water framework directive 8.3. Water quality and regulation. 8.4. International treaties and conventions on freshwater and wetland management Field report and presentation=15% Final exam=50%	4 and 6

Field work:

- Field visit to local sites and collection of water samples for subsequent analysis of water parameters (biological and physico-chemical) in the lab and interpretation of the result.
- Field trip to the surrounding lakes and rivers for the observation of conservation and management status of the major lakes and the associated wetlands
- Collection, preservation and identification of Ethiopian freshwater organisms.

5. Teaching Learning Methods:

Lectures, field work, individual or group projects, demonstrations, group work, and self directed assignment.

6. Assessment Method

Tests	30 %
Quiz.....	5%
Field report and présentation.....	15%
Final exam	50%
Total	100%

7. Course policies

- The university’s policy on course delivery shall be applied in this course
- Make-up exams can be given if and only if the case presented by the student is supported with legal document.
- Make-up class shall be conducted if classes are missed due to national holidays and/or when unpredicted conditions result class dismissal

8. Reference Materials.

1. Allan, J.D. (1995). Stream Ecology. Chapman & Hall. London
2. Batram, J. and Balance, R. (1996). Water Quality Monitoring: A Practical Guide to the Design and Implementation of Freshwater Quality Studies and Monitoring Progrmmes. 1st Edition; Published on Behalf of United Nations Environment Program (UNEP)/ WHO.
3. Chapman, D. (1996). Water Quality Assessments: A Guide to Use of Biota, Sediments and Water in Environmental Monitoring. (2nd ed.) Published on Behalf of United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Environment Program (UNEP)/World health organization (WHO).

4. Clare Shine and Cyrille de Klemm (1999). *Wetlands, Water and the Law. Using law to advance wetland conservation and wise use*. IUCN, Gland, Switzerland, Cambridge, UK and Bonn, Germany. xvi + 330 pp.
5. Cole, G.A. (1983). *Textbook of Limnology*. (3rd ed.) The C.V.Mosby Company, St. Louis
6. Kalff, J. (2002). *Limnology*. Printice Hall, Inc., USA.
7. Wetzel, R. (2001). *Limnology: Lake and River Ecosystems*. (3rd ed.). Elsevier Science, USA.

Checked by
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Date, 24/3/2020