



Department of Fish Resource and Aquatic Animals
College of Agricultural Engineering Sciences
University of Salahaddin

Subject: Aquatic Pollution

Course Book – (3rd Year)

Lecturer's name: Prof. Dr. Yahya A. Shekha/Theory
Asst. Lec. Iman Sherzad Ali/Practical

Academic Year: 2022/2023

Course Book

1. Course name	Aquatic Pollution
2. Lecturer in charge	Asst. Prof. Dr. Yahya A. Shekha / Theory Asst. Lec. Iman Sherzad Ali / Practical
3. Department/ College	Environmental Sciences- Science College of Agricultural Engineering Sciences I Fish Resources and Aquatic Animals Department
4. Contact	e-mail: yahyanian@gmail.com or yahya.shekha@su.edu.krd Tel: 07504532223 e-mail: iman.ali@su.edu.krd Tel: 07504818789
	For example Theory: 2 Practical: 3
6. Teacher's academic profile	<p>I attained the B.Sc. degree in Biology department college of Science at 1992. After three years (1995) I awarded M.Sc. degree in Aquatic Microbiology in the same department. At 31-5-2003 I upgrade scientifically to lecturer. The Ph.D. degree was awarded at 2008 in Ecology and Pollution/ Water quality and Pollution, Biology Department, University of Baghdad, Iraq.</p> <p>Academic titles to Assistant Professor was attained at 27-3-2009. My scientific upgrade to Professor Degree is under processed since 16-4-2016. During these years I taught student (B.Sc., M.Sc. and Ph.D.) in Biology and Environment departments of different College in many Universities in Kurdistan Region various topics related to biology and ecology. Till now I graduated four M.Sc. student and now I supervised PhD student in Environmental Sciences Department. I published more than 33 articles in local and international journals and participated in many scientific conferences.</p>
7. Course overview:	<p>In this course, students will learn about water pollution in general, sources related to water pollution, types of contaminants (organic or inorganic, natural or synthetic, degradable or non-degradable, microbial). Furthermore, they will learn about the different aquatic ecosystems in Iraqi Kurdistan Region and familiarize with various anthropogenic activities which are posing a threat to the existence of these ecosystems, and the ways in which these ecosystems can be preserved. Students will also learn about the ways by which it can be used to solve water pollution.</p>

8. Course objective:

Aquatic Pollution become one of the most important subject for all communities categories, it directly and indirectly affect human life, so it is important to study this subject for following reasons: learn the students all information about the water pollution, their components, constituents, living and non-living things in these aquatic ecosystems and the balance between the component in virgin or in clean environment, then known about all types of pollutant that may be physical, chemical or biological, or it may be from natural or artificial sources, or it may come from urban, industrial, agriculture source, then and how it may be effect on human being, what is the

guidelines for these pollutant, there safe ranges for human, animal or plant life.

Teach student how to protect the environment from pollutant and pollution sources, conserve these ecosystems, put legislation and laws for each topics, in order to control the level of pollution in different aquatic ecosystems.

Awareness is another point should be taken account in this subject to learn even the community about the importance of water pollution and keep aquatic ecosystem clean.

9. Student's obligation

The attendance of student in the hall is the most important thing for lecturer, because it is the way to conduct information to student, then participating of student through lecture time by asking them, known their background, conversation, homework, quiz, report, etc.

10. Forms of teaching

Different forms of teaching will be used to reach the objectives of the course: power point presentations for the head titles and definitions and summary of conclusions, description the types of pollution and their sources and any other illustrations, besides worksheet will be designed to let the chance for practicing on several aspects of the course in the classroom.

Graduate students will be required to review a scientific paper that relates to one of the course topics. The review will consist of a paper that is at a maximum of five pages (typed) in length and an oral presentation of the review (15 minutes in length). The goal is to have each student relate to the types and sources of environmental pollution. The format for the paper and presentation will be discussed in class.

11. Assessment scheme

Breakdown of overall assessment and examination

لغره مامؤسنا جؤرى ههاسهنگالدين (ناؤؤيكر دزه ومكان ئان به زمونم كان (دهنوس نيت بو زمونزه ناؤؤيكر دزه وهى مازگانه، كويزم كان، بيكر دزه وهى رهخهنگرانه) بريزه نه نيشن (، راپورت نووسين، وونار نووسين ئان نام ادهن هيوونى خوؤنكار له بؤلدا... مند. نامازه چهن د نجره وهى لهس مردم نيت و مامؤسنا چؤن زمه كان دابهش دهكات؟

12. Student learning outcome:

Aquatic pollution is the most important subject in our community because it has direct relation to our life, authority and NGOs and all companies give special importance to this subject. Student studies through this course it well cover all aquatic properties, pollutant, sources, effects, controlling, guidelines, conservation, restoration, well attended good information and knowledge about water pollution.

13. Course Reading List and References:

- Balkis, Nuray. (2012). Water Pollution. **Published by InTech**, Croatia. 201pp.
- Gray, N.V. (2010). Water Technology: An Introduction for Environmental Scientists and Engineers. 3rd Ed. IWA Publishing. 746pp.
- Nollert, F.M. (2007). Hand Book: Water Analysis. 2nd Ed. CRC Press Taylor & Francis Group, Boca Raton, USA. 763pp.
- Davis, M.L. (2010). Water and Wastewater Engineering: Design Principles and Practice. 2nd Ed. The McGraw-Hill Companies.

14. The Topics:	Lecturer's name
<ul style="list-style-type: none"> · Introduction to water pollution · Water pollution · Drinking water pollution · Nature of wastewater · The Sapropic system and Saprobic indices · Water quality index (WQI) · Water Pollution by Agrochemical pollutants · Heavy metals as water pollutant · Pesticides as water pollutant · Hydrocarbons as water pollutant · Microbial activity in aquatic ecosystems · Facultative pond in wastewater treatment 	Lecturer's name Asst. Prof. Dr. Yahya A. Shekha ex: (2 hrs)
15. Practical Topics	
<ul style="list-style-type: none"> · Determination of colour and Turbidity · Biochemical Oxygen Demand (BOD²⁰₅) · Chemical Oxygen Demand (COD) · Nitrite, Nitrate, Organic Nitrogen and Total Nitrogen · Determination of Nitrogen (Ammonia) · First practical examination · Determination of orthophosphate (PO₄) · Determination of Sulphate (SO⁻²₄) · Determination of heavy metals by atomic Absorption · Determination of Oil and greases · Algae as organic pollution indicators · Second practical examination · Detection of microorganisms · Insects as water pollution indicators · Presentation seminar by students 	Lecturer's name Asst. Lec. Iman Sherzad Ali ex: (3 hrs)
16. Examinations:	
<p>1. Compositional: In this type of exam the questions usually starts with Explain how, What are the reasons for...?, Why...?, How....? With their typical answers Examples should be provided</p>	

2. True or false type of exams:

In this type of exam a short sentence about a specific subject will be provided, and then students will comment on the trueness or falseness of this particular sentence. Examples should be provided

3. Multiple choices:

In this type of exam there will be a number of phrases next or below a statement, students will match the correct phrase. Examples should be provided.

17. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.