

BIO 5100/7110 - Aquatic Ecology

LECTURE: 10:00-11:15 Tue. & Thur. 218 State Hall

LABORATORY: 12:30-5:20 Mondays (see lab section of syllabus to determine Field or indoor lab)

- Field labs meet at loading dock behind Biological Sciences
- Indoor labs meet at 2028 Science Hall

LECTURE TEXT: *Textbook of Limnology -Fifth Edition* (required) by Cole and Weihe

Limnology: Lake and River Ecosystems, by R.G. Wetzel (Undergraduate Library desk reserve)

LABORATORY TEXT and notebook:

- *Limnological Analyses*, by R.G. Wetzel and G.E. Likens, 3rd ed. (Undergraduate Library desk reserve)
- A 3-ring binder

COURSE WEB SITE: blackboard.wayne.edu

PROFESSOR: Dr. Donna Kashian, 3115 Biological Sciences, 577-8052, dkashian@wayne.edu, Office hours by appointment

TA: Darrin Hunt 3177 Biological Sciences, 577-8107, veterinarytech@gmail.com, Office hour: Tue.12:00- 1:00 (and by appointment)

LECTURE TOPICS**	Freshwater Ecology Chapters (and Pages)	Tentative dates
1. General Introduction	Ch. 1,2 (8/31/Led by Darrin Hunt)	8/31 & 9/5
2. Physical Limnology	Ch. 9,10,11	9/7
3. Physical Limnology	Ch. 9,10,11	9/12
4. Wetlands Part I	Ch. 7	9/14
5. Water Chemistry	Ch. 12,13, 14, 15	9/19
6. Freshwater Biota (Introduction)	Ch. 2	9/21
7. Primary Producers	Ch. 3; 4(79-84)	9/26
8. Phytoplankton Dynamics	Ch.3 (65-67); 8(178-182) (see also Wetzel)	9/28
Hour Exam 1 100 points Lectures 1 - 8		10/3
9. Consumers	Ch. 4(85-91)	10/5
10. Zooplankton Dynamics	Pages: 49-54-57	10/10
11. Decomposition and Microbial Dynamics	Pages: 65-67; 178-182	10/12
12. Trophic Dynamics	Ch.4 (91-93)	10/17
13. Benthic Ecology	Ch. 3(57-59)	10/19
14. Invasive species	See reading posted in blackboard	10/24
15. Fish Ecology	Ch. 3(56-57)	10/26
16. Community and Population Dynamics	Ch 4 (71-85)	10/31
17. Paleolimnology	Pages: 2,95,109-117	11/2
Hour Exam 2 100 points Lectures 9 - 16		11/7
18. Ground water & Stream Ecology	Ch.8	11/9
19. Stream Ecology	Ch.8	11/14
20. Stream Ecology	Ch.8	11/16
21. Desert and Tropical Limnology	Ch 14 (338-341)	11/21
22. Water Pollution	See reading posted in blackboard	11/23
23. Water associated disease	See reading posted in blackboard	11/28
24. Applied limnology/policy/design	See reading posted in blackboard	11/30
25. Climate change	See reading posted in blackboard	12/5
26. Review	TBD	12/7
FINAL EXAM: 150 points		Dec. 17

**** The instructor reserves the right to make changes to the above schedule and topics****

COURSE OBJECTIVES:

- To develop an understanding of the basic structure and function of freshwater systems, including physical, chemical, and biological
- To develop an understanding of human interactions with the freshwater environment, including pollution and aquatic ecosystem management
- To provide a field biology course applicable to the Environmental Science curriculum and useful in careers involving issues in aquatic ecology

LECTURE EXAMS:

The lecture hour exams and final exam will consist of a combination of multiple choice, fill-in-the-blank, and short essay (definitions, explanations, etc.) questions.

MAKEUP EXAM POLICY:

There will be no make up exams provided for Hour Exams 1 and 2. If an unavoidable significant conflict arises prior to a scheduled exam, we will attempt to reschedule the exam for everyone for the next class meeting day (if there is sufficient lead time to do this fairly for the class). If this is not possible, and the student's absence from an exam is a legitimate documented emergency, then the student's score on the cumulative portion of the Final Exam may (at the discretion of the instructor) be pro-rated to cover the missed exam.

GRADING:

A total of 560 points (for Bio 5100) and 575 points (for Bio 7110) are available to be earned. There are no opportunities for extra credit or alternative assignments. Course grades are determined from total point accumulation at the end of the semester, with final letter grades based generally on a straight scale, modified as appropriate depending on the level of achievement of the highest scoring students. Letter grades are not recorded for individual exams during the term (only point scores are recorded); however, an unofficial scale is provided for each exam for approximate evaluation. **Failure to turn in or present the writing project, annotated bibliography, and/or lab notebook will result in a deduction of 100 points from your final grade.**

ADD/DROP POLICY:

Add forms will not be signed after the second week of class. I encourage you to get help instead of withdrawing. If you need to withdraw, **September 13, 2017 is the last day you can drop the class and get your tuition refunded.** The last day you can drop this course and have **no record on your transcript is September 27, 2017.** Sunday Nov 23 is **the last drop date.** You initiate a withdrawal request in Academica (Pipeline), and the system will contact me. I will respond within five business days. See <https://wayne.edu/students/calendar/2017-2018/> for more important dates.

Please note that “**incomplete**” grades will not be issued to students in poor standing who are seeking an alternative to a late drop.

CHEATING POLICY:

A student found cheating during an exam (using a “cheat sheet” or electronic device, looking at another's paper, or allowing another to look at yours), or by turning in an assignment containing any plagiarism, will receive a zero for that test or assignment with no opportunity to drop or replace

that score. A second episode of cheating will result in a grade of F for the course and possible university disciplinary action.

Students with disabilities: If you have a physical or mental impairment that may interfere with your ability to successfully complete the requirements for this course, you are invited to contact Educational Accessibility Services (583 Student Center Building; 577-1851) to discuss appropriate accommodations on a confidential basis.

Academic disputes, including issues not specifically resolved or covered by this syllabus, will be resolved by following the guidelines for University Student Due Process.

AQUATIC ECOLOGY LABORATORY AND FIELD EXERCISES

METHODS MANUAL: *Limnological Analyses*, by R.G. Wetzel and G.E. Likens, 3rd ed., 2000, Springer Verlag

BIOTA IDENTIFICATION KEYS: *Guide To The Study Of Freshwater Biology*, by J.G & P.R. Needham, 1962, Holden-Day

DATE	ACTIVITY (<i>Wetzel & Likens lab manual exercises</i>)
Sept. 11	Field Trip: Kensington Metro Park: Boat excursion –Water Quality Sampling- See blackboard: Pre-lab reading and lab review
Sept 18	Field Trip: Island Lake State Park- Fish
Sept 25	Field Trip: Vegetation Survey- Wetland assessment: Fish Beach Seine
Oct 2	Field Trip: Macroinvertebrate /River assessment (Island Lake St. Park) Pre-lab reading Ch. 6 text book
Oct 9	Field Trip: Microbiology (Belle Isle): See blackboard Belle Isle : Pre-lab reading and lab review
Oct 16	Field Trip: TBD
Oct 23	Field Trip: Waste water treatment plant
Oct 30	Field Trip: NOAA LAB
Nov. 6	LAB: Thermal stratification lab models & power point demo See blackboard: Pre-lab reading and lab review
Nov. 13	LAB: amphibians and diversity indices
Nov. 20	LAB: biota analyses, macroinvertebrate and algae
Nov. 27	LAB: biota analyses-Fish
Dec 4	Project presentations: Will be held in Room 1177 Biological Sciences
Dec 11	Lab Exam Web Reports & Lab Notebooks due

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Attendance: Your prompt attendance is required at ALL laboratory sessions. You must contact Dr. Kashian in advance if you will be missing a laboratory. Vehicles of field trips will LEAVE no more than 5 min after the start of class for field trip days you will meet at the vehicles (unless otherwise noted)

GRADING: BIO 5100

Lab Notebook	50 points
Lab Exam	100 points
Research writing project	75 points (25 points presentation/50 points paper)

Lecture Exams	325 points
Annotated Bibliography	10 points

GRADING: BIO 7110

Lab Notebook	50 points
Lab Exam	100 points
Research writing project	75 points (25 points presentation/50 points paper)
Lecture Exams	325 points
Annotated Bibliography	25 points

LAB NOTEBOOK

A 3-ring binder notebook will be maintained containing handouts, lab notes, raw data and graphs etc., species lists, exercise or demonstration descriptions and results, etc. It will be submitted on the last day of lab and graded subjectively for completeness, coherence, and neatness.

LAB EXAM

The Lab Exam will consist of identifications of equipment and function, explanations of analytic procedures, and identifications of biota

BIO 5100: Annotated Bibliography

Students must produce an annotated bibliography for 3 (of their choice) of the reading assignments posted on blackboard. Please see:
<http://olinuris.library.cornell.edu/ref/research/skill28.htm#annot>

BIO 7110: Annotated Bibliography

Students must produce an annotated bibliography for 10 (of their choice) of the reading assignments posted on blackboard. Students may select 4 papers that are not on the list to count towards their 10. Please see:

<http://olinuris.library.cornell.edu/ref/research/skill28.htm#annot>

Student may turn in a draft bibliography for a single paper by October 1st via blackboard, for an initial review of content. **The completed bibliography will due (via a blackboard submission) on Tuesday November 16th.**

BIO 5100: Research writing project

The Web Project will consist of obtaining quantitative data from a freshwater Website and constructing a written analysis of the limnological situation or ecological issues presented on the Website (suggested Websites will be provided). Students will have the option of doing a modified research proposal as described in the Bio 7100 Research writing project below. The Project will be presented orally briefly (ca. 10 min) and submitted in written form (1 to 3 pages double spaced) on the last day of lab.

BIO 7110: Research writing project

Students will prepare a research proposal on the topic of their choice. Graduate students projects must NOT be on their thesis/dissertation topic unless agreed upon by the instructor.

WEB SITES ON WATER QUALITY

- 1) Water on the Web: <http://waterontheweb.org/>

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- 2) An assortment of data sets that relate to the Detroit River Watershed
http://ciler.snre.umich.edu/fca/data_sets.php
- 3) I will also be happy to provide you a data set from my research. Please let me know if you would like to do this. This data will be provided only for your research project and must not be distributed beyond class use.
- 4) World Lake Database: <http://wldb.ilec.or.jp/>

Many additional sites are reachable via Google Scholar, using key words [water quality data sites](#)