

# Syllabus for Biology 292

## Aquatic Biology

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**Office Hours:** MWF 9:00-10:00 AM and by appointment

**Classrooms:** Lecture - 235 PPHAC; TR 10:20 AM-11:30 AM  
Lab -300 Collier; T 12:45 PM-3:45 PM

**Course Description:** An introduction to the ecology of inland waters, including lakes, ponds, wetlands and streams. Major topics include geologic origins, typology, geographic distribution, biota, ecological succession, ecosystem function and restoration/management as applied to freshwater habitats. Emphasis is placed on the interaction between organisms and the environment. Laboratories include use of field equipment, field research techniques, and identification of aquatic organisms, including protozoa, invertebrates, fish, herpetofauna and plants. Many laboratories will be conducted out of doors, and there is one required field trip off campus. This course serves as an elective for Biology and Environmental Science majors and minors.

**Course Objectives:** Upon completion of this course students will be able to:

- 1) Demonstrate a basic understanding of the physical, chemical, and biological characteristics of lakes and streams
- 2) Understand and properly use appropriate terminology
- 3) Demonstrate the ability to interpret freshwater data
- 4) Gain a familiarity with the basic tools of freshwater research
- 5) Demonstrate a basic understanding of how to design and conduct freshwater research
- 6) Know where to find information about freshwater ecosystems
- 7) Demonstrate the ability to communicate data concerning lakes and streams
- 8) Identify major groups of aquatic organisms
- 7) Work together as an individual and in teams

## 2

**Texts:** Dodson, Stanley I. 2005. *Introduction to Limnology*, McGraw-Hill, Boston (ISBN 9789-0-07-287935-3).

Additional papers as assigned

**Grading:** The grading system is as follows:

|    |   |            |    |   |                |
|----|---|------------|----|---|----------------|
| A  | = | 93.0-100.0 | D+ | = | 67.0-69.9      |
| A- | = | 90.0-92.9  | D  | = | 63.0-66.9      |
| B+ | = | 87.0-89.9  | D- | = | 60.0-62.0      |
| B  | = | 83.0-86.9  | F  | = | 59.9 and below |
| B- | = | 80.0-82.9  |    |   |                |
| C+ | = | 77.0-79.9  |    |   |                |
| C  | = | 73.0-76.9  |    |   |                |
| C- | = | 70.0-72.9  |    |   |                |

|  |            |
|--|------------|
| <b>Assessments:</b> Lecture Midterm Exam | 15%        |
| Final Exam                               | 20%        |
| Laboratory Midterm Exam                  | 15%        |
| Class Assignments                        | 20%        |
| Field Investigation Assignments          | <u>30%</u> |
|  | 100%       |

### **Guidelines for Written Assignments:**

(Written by Ben Slote and modified slightly by Ann Bomberger)

- 1) Written work in the A range is based on an original, logical and coherently organized set of ideas; it makes a clear and persuasive argument (even if the reader disagrees with its argument); it brings in specific, relevant examples to back up its assertions; its points, at each turn, are clearly articulated: the words carry precise meaning, they don't obscure it; its sentences use only the words their ideas require, not anymore; its paragraphs have distinct though related roles in the essay's cohesion as a whole, each holding one thoroughly asserted idea (not two competing ideas, not one idea half-asserted); if appropriate it accurately and thoughtfully uses other sources; and its sentences are without the grammatical, spelling, or typographical mistakes that exacting proof-reading would catch. (All of this takes a lot of work. If it is all very nearly accomplished, the essay usually earns an A-.)
- 2) Written work in the B range: a very good paper, the writing of which is clearly, thoughtfully, and effectively executed. What sometimes prevents an "A" is a lack of originality, thorough thinking or careful proofreading. If two of these virtues are absent and the other areas of the paper are strong, the essay will usually earn a B-.

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- 3) Written work in the C range: some conspicuous flaw usually earns an essay a C; its argument is really underdeveloped, it contains only minimal textual support, it has problems with organization and/or sentence clarity, it is in dire need of proofreading.
- 4) Written D work either contains more than one of the large problems cited in the "C" description or finds another way to convince its reader that the author has not spent nearly enough time on the thinking or writing in the essay.
- 5) Written work that earns an F misses on all criteria (originality, articulateness, persuasiveness, organization, the absence of mechanical mistakes).

#### **Course Guidelines:**

1. It has been my experience that students who do poorly in this course generally have numerous absences. I strongly suggest that you attend and participate in all lecture sessions unless you have a valid reason not to. I will not specifically maintain lecture attendance records. However, if I detect that you have excessive absences or are habitually late to class I will speak with you in private.

Laboratory sessions, because they involve hands-on experiences that cannot be mastered effectively without performing them, are especially critical if one is to become a successful scientist. I will take attendance at laboratory sessions and field trips and part of your grade for "Field Trip Assignments" will be based on your active participation in these activities.

If you arrive late, be respectful by not disrupting a class already in progress.

2. All assignments are expected to be handed in according to the due date on the syllabus or announced in class. Late work will be penalized; the instructor will assess the penalty for any late work.
3. All students are expected to follow the principles of academic honesty as set out in the policies of Moravian College. See the Student Handbook for details. Any and all written work must be done in your own words (with the exception of direct quotations which are clearly indicated as such), and written work must include proper citations indicating the sources for any ideas, concepts, facts, or other information derived from others, whether or not you have restated it in your own words. Any cases of suspected cheating or plagiarism will be referred to the Academic Affairs Office. Academic dishonesty may result in a failing grade in the course.
4. In case of any crisis or emergency, or an extended absence from class, you must inform me either personally through Learning Services or the Academic Dean's Office.
5. Learning disability accommodations: students who wish to request accommodations in this class for support of learning disabilities should contact Learning Services (x1510).

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Accommodations cannot be provided until authorization is received from the appropriate disability support provider on campus.

6. These guidelines are intended for the benefit of the students as far as clarification of the instructor's expectations for the course; however, in exceptional circumstances the instructors reserve the right to exercise discretion in the application of these guidelines to individual cases or to refer a particular case to the Academic Dean if necessary.

### **Classroom Expectations:**

- 1) Respect for others' answers and views.
- 2) Disruptive behavior during class will result in your dismissal from the class the first time, after that, disciplinary action will be taken.
- 3) Non-alcoholic drinks and non-odiferous foods are allowed in class; food that is especially odiferous is not permitted.
- 4) Attention to course related material only.

## Aquatic Biology Lecture

Spring 2012

## Schedule

| Day & Date | Topic  | Reading                                      |
|------------|--|--|
| T Jan. 17  | Introduction to Limnology<br>Lab Intro: Platyhelminthes, Nematoda,<br>Nematomorpha, Gastrotricha<br>Rotatoria & Annelida         | Dodson, Ch. 1<br>Dodson, pp. 85-92           |
| Th 19      | Water as an Environment  | Dodson, Ch. 2                                |
| T 24       | Water as an Environment<br>Lab Intro: Protozoa, Porifera,<br>Cnidaria, Bryozoa & Tartigrada                                      | Dodson, Ch. 2<br>Dodson, pp. 65-79           |
| Th 26      | Water as an Environment  | Dodson, Ch. 2                                |
| T 31       | Population Dynamics<br>Lab Intro: Freshwater Crustacea<br>& Mollusks   | Dodson, Ch. 6<br>Dodson, pp. 92-109; 121-124 |
| Th Feb. 02 | Population Dynamics  | Dodson, Ch. 6                                |
| T 07       | Population Dynamics<br>Lab Intro: Aquatic Insects:<br>Odonata, Hemiptera, Plecoptera<br>& Ephemeroptera                          | Dodson, Ch. 6<br>Dodson, pp. 109-115         |
| Th 09      | Species Interactions &<br>Community Structure  | Dodson, Ch. 7                                |
| T 14       | Species Interactions &<br>Community Structure<br>Lab Intro: Aquatic Insects:<br>Coleoptera, Megaloptera,<br>Tricoptera & Diptera | Dodson, Ch. 7<br>Dodson, pp. 109-115         |
| Th 16      | Freshwater Community Dynamics  | Dodson, Ch. 8                                |

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|    |      |    |  |                                    |
|----|------|----|--|------------------------------------|
| T  |      | 21 | Freshwater Community Dynamics<br>Lab Intro: Freshwater Algae | Dodson, Ch. 8<br>Dodson, pp. 76-79 |
| Th |      | 23 | Freshwater Community Dynamics                                | Dodson, Ch. 8                      |
| T  |      | 28 | No Lecture—Study for Lab Exam!                               |                                    |
| Th | Mar. | 01 | <b>Lecture Midterm Exam</b>                                  |                                    |
| T  |      | 06 | No Class-Spring Break  |                                    |
| Th |      | 08 | No Class-Spring Break  |                                    |
| T  |      | 13 | Aquatic Ecosystems: Energy Flow                              | Dodson, Ch. 9                      |
| Th |      | 15 | Aquatic Ecosystems: Energy Flow                              | Dodson, Ch. 9                      |
| T  |      | 20 | Aquatic Ecosystems: Energy Flow                              | Dodson, Ch. 9                      |
| Th |      | 22 | Lecture Exam II  |                                    |
| T  |      | 27 | Aquatic Ecosystems: Chemical Cycles                          | Dodson, Ch. 10                     |
| Th |      | 29 | Aquatic Ecosystems: Chemical Cycles                          | Dodson, Ch. 10                     |
| T  | Apr. | 03 | Aquatic Ecosystems: Chemical Cycles                          | Dodson, Ch. 10                     |
| Th |      | 05 | Water in Landscapes: Lotic Systems                           | Dodson, Ch. 11                     |
| T  |      | 10 | Water in Landscapes: Lotic Systems                           | Dodson, Ch. 11                     |
| Th |      | 12 | Water in Landscapes: Lentic Systems                          | Dodson, Ch. 11                     |
| T  |      | 17 | Water in Landscapes: Lentic Systems                          | Dodson, Ch. 11                     |
| Th |      | 19 | Semi-terrestrial Ecosystems                                  | Dodson, Ch. 11                     |
| T  |      | 24 | Conservation & Management                                    | Dodson, Ch. 12                     |
| Th |      | 26 | Conservation & Management                                    | Dodson, Ch. 12                     |

**Final Exam: Monday, April 30 @ 1:30 PM**

## Laboratory & Field Schedule Spring 2010

| Date    | Lab   |
|---------|---|
| Jan. 17 | Platyhelminthes, Nematoda, Nematomorpha, Gastritricha, Rotatoria & Annelida |
| Jan. 24 | Protozoa, Porifera, Cnidaria, Bryozoa & Tardigrada                          |
| Jan. 31 | Freshwater Crustacea & Mollusks   |
| Feb. 7  | Aquatic Insects: Odonata, Hemiptera, Plecoptera & Ephemeroptera             |
| Feb. 14 | Aquatic Insects: Coleoptera, Megaloptera, Tricoptera & Diptera              |
| Feb. 21 | Freshwater Algae  |
| Feb. 28 | Laboratory Practical  |
| Mar. 6  | No Lab: Spring Break  |
| Mar. 13 | Field investigations  |
| Mar. 20 | Field investigations  |
| Mar. 27 | Field investigations  |
| Apr. 3  | Field investigations  |
| Apr. 10 | Field investigations  |
| Apr. 17 | Field investigations  |
| Apr. 24 | Field investigations  |