Freshwater Ecology

the course formerly known as



Biology 3371 – Fall 2019

Dr. [Dirnberger](http://science.kennesaw.edu/~jdirnber/)

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The class webpage: [*http://facultyweb.kennesaw.edu/jdirnber/freshwater-ecology.php*](http://facultyweb.kennesaw.edu/jdirnber/freshwater-ecology.php)

*"A lake is a landscape's most beautiful expressive feature: it is earth's eye, onlooking into which the beholder measures the depth of his own nature."*

* Henry David Thoreau

*`Believe me, my young friend, there is NOTHING--absolutely nothing--half so much worth doing as simply messing about in boats. Simply messing,' he went on dreamily: `messing--about--in--boats; messing----'*

* The River Rat to the Mole in the “[The Wind in the Willows](http://www.online-literature.com/grahame/windwillows/)” by [Kenneth Grahame](http://www.online-literature.com/grahame/)



**OBJECTIVES/ COURSE DESCRIPTION**

This course focuses on why aquatic systems function as they do.  The goal of the course is to develop a comprehensive and integrated understanding of physical, chemical and biological processes occurring in lakes, streams and wetlands using the scientific method to investigate, and compare and contrast basic ecological processes operating in various systems.

1. Demonstrate a basic understanding of major freshwater ecosystems, especially lake, wetland, and stream systems.
2. Be familiar with parameters used to measure processes occurring in aquatic systems, demonstrate ability to measure these parameters, and use these parameters to explain patterns and processes observed in freshwater systems.
3. Recognize ecologically important freshwater taxa.
4. Be familiar with basic natural history of important freshwater taxa
5. Develop critical thinking skills for explaining observed differences within and among ecosystems visited during the semester.
6. Be able to use concepts occurring in aquatic systems to explain and address environmental problems in freshwater systems.

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| **Week of:** | **Tuesday** | **Thursday** |
| **19-Aug** | **Lecture****Lab** – Lake types and uses | **Lecture****Lab** – Lake types and uses |
| **26-Aug** | **Lecture** **Lab** – Intro to limnological instrumentation and measurements | **Lecture** **Lab** – Intro to limnological instrumentation and measurements |
| **2-Sep** | **No lecture** Tuesday’slab section starts at beginning of lecture time for Group #1Tues.**Lab - Field Trip** - Allatoona: physical/chemical | **No lecture** Thursday’slab section starts at beginning of lecture timefor Group #1Thur.**Lab - Field Trip** - Allatoona: physical/chemical**On-line assignment due** |
| **9-Sep** | **Lecture** **Lab –** physical/chemical analysis  | **EXAM-1 during lecture time****Lab –** physical/chemical analysis  |
| **16-Sep** | **No lecture** Tuesday’slab section starts at beginning of lecture time for Group #1Tues.**Lab - Field Trip** - Allatoona: plankton, chlorophyll and productivity**~~Trophic cascade assignment due~~ - moved** | **No lecture** Thursday’slab section starts at beginning of lecture time for Group #1Thur.**Lab - Field Trip** - Allatoona: plankton, chlorophyll and productivity |
| **23-Sep** | **Lecture** **Lab –** Phytoplankton & chlorophyll**LAB REPORT #1 DUE** | **Lecture** **Lab –** Phytoplankton & chlorophyll |
| **30-Sep** | **Lecture or alternative Allatoona field date** in case previous trips are cancelled due to weather. | **Lecture or alternative Allatoona field date** in case previous trips are cancelled due to weather. |
| **7-Oct** | **Lecture** **Lab –** Zooplankton – Part I**Trophic cascade assignment due** | **Lecture** **Lab –** Zooplankton – Part I |
| **14-Oct** | **Lecture** **Lab** – Zooplankton – Part II | **Lecture** **Lab** – Zooplankton – Part II |
| **21-Oct** | **EXAM-2 during lecture time**, **Lab - Field Trip** – Freshwater marsh (be prepared to hike) | **No lecture** Thursday’slab section starts at beginning of lecture time **Lab - Field Trip** – Freshwater marsh(be prepared to hike) |
| **28-Oct** | **Lecture** **Lab** – Freshwater marsh analysis and discussion of data analysis for Lab Report #3**LAB REPORT #2 DUE** | **Lecture** **Lab** – Freshwater marsh analysis and discussion of data analysis for Lab Report #3 |

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| **4-Nov** | **No lecture** Tuesday’slab section starts at beginning of lecture time **Lab - Field Trip –** Stream ecology | **No lecture** Thursday’slab section starts at beginning of lecture time **Lab - Field Trip –** Stream ecology |
| **11-Nov** | **Lab** **Lecture** – Stream ecology work-up **LAB REPORT #3 DUE** | **EXAM – 3 during lecture time****Lab** – Stream ecology work-up |
| **18-Nov** | **Lecture** **Lab** – Stream ecology work-up continued | **Lecture** **Lab** – Stream ecology work-up continued |
| **25-Nov** | Fall Break – no class | Fall Break – no class |
| **2 Dec** | **Lecture**, then**Lab - Field Trip** – Lake **management** **LAB REPORT #4 DUE** | **Lecture**, then**Lab - Field Trip** – Lake management |
| **9 Dec** | **no lecture or lab** | **FINAL EXAM** **10:30am for Thursday lab section****1:00pm for Tuesday lab section** |

On fieldtrip days to Lake Allatoona, I will divide the class into four “shifts” where different shifts will be asked to arrive at (and leave from) the field site at different times (only 4 students can fit on the boat at one time). You will be asked to drive to the site or carpool with someone in your group. On these dates, the first shift begins during lecture time (obviously, there will be no formal lecture at this time). Be prepared and dress appropriately for fieldwork. We will go out in most weather. Don’t be late or your will figuratively and literally miss the boat!

In lecture, we will discuss selected topics and previously collected data, as well as generate hypotheses that will be tested during fieldtrips. You should feel free to contribute to lectures and discussions.

**LAB REPORTS**

* Lab report #1 Lakes: Physical and chemical parameters
* Lab report #2 Lakes: Trophic interactions
* Lab report #3 Wetlands
* Lab report #4 Streams

**All four lab reports will be handed in through** [**Turnitin.com**](https://turnitin.com) **(you must “enroll” at this site if you have not already done so in another class). See below for class id number.**

For help writing your lab reports, see:

* [Guidelines for Writing a Lab Report](http://facultyweb.kennesaw.edu/jdirnber/%7B%7Bf%3A19049512%7D%7D)
* [Guide explaining the characteristics of scholarly, peer reviewed, and popular articles](http://libguides.kennesaw.edu/content.php?pid=134793&sid=1155665)
* [e-Searching the scientific literature at KSU](http://facultyweb.kennesaw.edu/jdirnber/%7B%7Bf%3A19049554%7D%7D)

**Some Classic Freshwater Ecology Books in the KSU Library**

* Ecology of Inland Waters and Estuaries - Reid
* Limnology in North America - Frey
* Limnology - Welch
* Limnological Methods - Welch
* Fundamentals of Limnology - Ruttner
* A Treatise on Limnology: Vol. 1 - Hutchinson
* A Treatise on Limnology: Vol. 2 – Hutchinson

**The KSU Writing Center** helps students in all majors improve their writing. Experienced, friendly writing assistants help with topic development, revision, research, documentation, grammar, and more. For additional information or to make an appointment, visit writingcenter.kennesaw.edu or stop by English Building, Room 242 (Kennesaw campus) or Building A, Room 184 (Marietta campus).

**TURING ASSIGNMENTS ONLINE**

Assignment and lab reports should be submitted through **Turnitin.com**. The class id is **21787630**

 **for both sections.** and the super-secret password (enrollment key) is “**Freshwater**”.

**PREREQUSITES**

A grade of “C” or better in BIOL 1107/1107L and BIOL 1108/1108L.

**Required books:**

*None. There will be web-based readings and assigned papers instead. See class webpage:* [*http://facultyweb.kennesaw.edu/jdirnber/freshwater-ecology.php*](http://facultyweb.kennesaw.edu/jdirnber/freshwater-ecology.php)

**Grades:**

Exams 75 pts each = 300 pts

Temperature Variation on-line assignment 25 pts = 25 pts

Lab reports 50 pts each = 200 pts

Trophic cascade assignment25 pts = 25 pts

Group work / Participation 25 pts = 25 pts

 ***575 pts***

**A**= 90%;  **B**= 80%; **C**= 70%; **D**= 60%

**Office hours**

Wednesday 2-4 pm, Friday 1-3 pm, or by appointment

If you cannot make it during these times, I will be glad to make an appointment with you. If you are having any problems with the material, please come by and see me. Don't put it off until it is too late.

**POLICIES**

* Attendance: You must show up for field trips on time or you may get left behind! Attendance on trips is important because some exam questions will be based on observed systems. An understanding of processes within a study system is certainly enhanced by first-hand observation of that system.
	+ **Unexcused** absences on field trips and labs will result in a 10% reduction per absence on that lab report.
	+ To make-up **excused** absences for field and lab days, you must cite 3 additional references in your lab report. These references must be relevant to our study and must be from referred journals.
* Late lab reports will result in a 2% reduction per day starting immediately after the due date and time.
* Keep all of your returned, graded work (exams and lab reports). You must have these materials if you decide to contest your final course grade.

**Safety**

**Safety must be a primary concern when in lab and in the field.** You must review the Laboratory Safety Guidelines at: <http://science.kennesaw.edu/governance/LaboratorySafetyGuidelines_2015.pdf>.

When we are in the field, watch where you step. Don’t reach into an area that you cannot see into. Wear shoes that cover the foot and socks that cover the ankle to avoid poison ivy and bites. Avoid contact with wildlife. If the weather is hot and sunny, be sure to stay [hydrated](http://www.symptomsofdehydration.com/). Avoid fast moving water and deep areas in streams, especially while wearing waders. Let me know before going into the field whether you are allergic to such things as bee stings. Stay seated when the boat is running. You must wear a life jacket when on the boat.

**Accommodations**

Any student with a documented disability or medical condition needing academic accommodations of class-related activities or schedules must contact the instructor immediately. Written verification from the KSU Student Disability Services (<http://sds.kennesaw.edu/> ) is required. No requirements exist that accommodations be made prior to completion of this approved University documentation. All discussions will remain confidential.

**ACADEMIC WITHDRAWaL POLICY**

The policy for academic withdrawal can be found in the KSU course catalog. **LAST DATE TO WITHDRAW WITHOUT ACADEMIC PENALTY is OCTOBER 9th.**

# Academic Integrity

Every KSU student is responsible for upholding the provisions of the Student code of Conduct, as published in the Undergraduate and Graduate catalogs. The Student Code of Conduct addresses the University’s policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/falsification of University records or academic malicious/intentional misuses of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the Student Conduct and Academic Integrity department, which includes either an “Informal” resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct’s minimum one semester suspension requirement. See <http://scai.kennesaw.edu/codes.php> for more details.