MARN 4001: Measurement and Analysis in Coastal Ecosystems

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TuTh, 1-5pm, Room 105

*Pre-requisites*

Intro chemistry, biology, physics, and calculus, MARN 2002, MARN 3001

*Course Description*

The course this year is focused principally on assessing the potential cause(s) of water quality impairment in Wequetequock Cove near the town of Stonington and in the nearby lower Pawcatuck River. The non-profit organization *CUSH* (Clean Up Sound and Harbor) has conducted an inter-annual survey of the water quality of coves and small estuaries in and around Mystic and Stonington, and discovered that Wequetequock Cove in the summer suffers from near complete oxygen depletion, and consequently, has little in the way of animal life in the water column and shallow benthos. The causes of this impairment stems from an overabundance of nutrients delivered to the cove, yet the dominant source(s) of said nutrients remain unclear. In order to help *CUSH* and the residents of Wequetequock Cove in identifying the potential causes and mechanisms of watershed impairment, we will conduct research in and around Wequetequock Cove to investigate sources of nutrients to the cove, and their effect on the oxygen concentrations therein.

*Course Objectives*

* + Gain familiarity with:
    - Basic laboratory techniques
    - Field sample collection
    - Measurement protocols
    - Adequate standardization of measurements
  + Develop competency in data acquisition, archiving, treatment and analysis
  + Become adept at graphical presentation of data
  + Get experience in hypothesis testing and data interpretation
  + Construct a scientific poster to present scientific findings to a broad audience

*Grading*

Participation 10%

Homework and in-class assignments (see schedule) 55%

Mid-term test 25%

Group poster project 10%

*Due Dates and Late Policy*

* Attendance and participation to all classes is mandatory; missed classes must be justified with a formal excuse.
* **5% will be deducted daily** for missed assignment deadlines, up until graded assignments are handed back (could be the next day!), **after which late assignments will no longer be considered**. Assignments will be graded and returned to you within a week of their due date.

*Grading Scale:*

| Grade | Letter Grade | GPA |
| --- | --- | --- |
| 93-100 | A | 4.0 |
| 90-92 | A- | 3.7 |
| 87-89 | B+ | 3.3 |
| 83-86 | B | 3.0 |
| 80-82 | B- | 2.7 |
| 77-79 | C+ | 2.3 |
| 73-76 | C | 2.0 |
| 70-72 | C- | 1.7 |
| 67-69 | D+ | 1.3 |
| 63-66 | D | 1.0 |
| 60-62 | D- | 0.7 |
| <60 | F | 0.0 |

*Student Code*  
Discussion of the assignments among students is encouraged, but assignments are to be completed individually; **Plagiarism will not be tolerated.**

You are responsible for acting in accordance with the [University of Connecticut's Student Code](http://www.community.uconn.edu/student_code.html). Review and become familiar with these expectations. In particular, make sure you have read the section that applies to you on Academic Integrity:

* [Academic Integrity in Undergraduate Education and Research](http://www.community.uconn.edu/student_code_appendixa.html)
* [Academic Integrity in Graduate Education and Research](http://web9.uits.uconn.edu/gradschool/current/academic_integrity.html)

Cheating and plagiarism are taken very seriously at the University of Connecticut. As a student, it is your responsibility to avoid plagiarism. If you need more information about the subject of plagiarism, use the following resources:

* [Plagiarism: How to Recognize it and How to Avoid It](http://lib.uconn.edu/instruction/tutorials/plagiarism.htm)
* [Instructional Module about Plagiarism](http://irc.uconn.edu/PlagiarismModule/intro_m.htm)
* [University of Connecticut Libraries’ Student Instruction](http://lib.uconn.edu/instruction/students.htm) (includes research, citing and writing resources)

Copyright

Copyrighted materials within the course are only for the use of students enrolled in the course for purposes associated with this course and may not be retained or further disseminated.

Netiquette and Communication

At all times, course communication with fellow students and the instructor are to be professional and courteous. It is expected that you proofread all your written communication, including discussion posts, assignment submissions, and mail messages. If you are new to online learning or need a netiquette refresher, please look at this guide titled, [The Core Rules of Netiquette](http://www.albion.com/netiquette/corerules.html).

Adding or Dropping a Course

If you should decide to add or drop a course, there are official procedures to follow:

* Matriculated students should add or drop a course through the [Student Administration System](https://student.studentadmin.uconn.edu/).
* Non-degree students should refer to [Non-Degree Add/Drop Information](http://nondegree.uconn.edu/options.htm) located on the registrar’s website.

You must officially drop a course to avoid receiving an "F" on your permanent transcript. Simply discontinuing class or informing the instructor you want to drop does not constitute an official drop of the course. For more information, refer to the:

* [Undergraduate Catalog](http://catalog.uconn.edu/)
* [Graduate Catalog](http://graduatecatalog.uconn.edu/)

<http://catalog.grad.uconn.edu/grad_catalog.htmlgrad_catalog.html>

Academic Calendar

The University's [Academic Calendar](http://www.registrar.uconn.edu/calendar.htm) contains important semester dates.

Academic Support Resources

[Technology and Academic Help](http://ecampus.uconn.edu/help.html) provides a guide to technical and academic assistance.

Students with Disabilities

Students needing special accommodations should work with the University's [Center for Students with Disabilities (CSD)](http://www.csd.uconn.edu/index.html). You may contact CSD by calling (860) 486-2020 or by emailing csd@uconn.edu. If your request for accommodation is approved, CSD will send an accommodation letter directly to your instructor(s) so that special arrangements can be made. (Note: Student requests for accommodation must be filed each semester.)

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government.” (Retrieved March 24, 2013 from

<http://www.blackboard.com/platforms/learn/resources/accessibility.aspx>)

**Evaluation of the course**

Students will be provided an opportunity to evaluate instruction in this course using the University's standard procedures, which are administered by the[Office of Institutional Research and Effectiveness](http://www.oire.uconn.edu/) (OIRE).

Additional informal formative surveys may also be administered within the course as an optional evaluation tool.

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| **class** | **date of 2016** | **Activity** | **Note** | | **Assignments handed out** |
| 1 | Tuesday, August 29, 2017 | Intro class | Oxygen in aquatic systems | | **Worksheet 1:** O2 in Weque Cove |
| 2 | Thursday, August 31, 2017 | LAB: O2 by Winkler titrations | Winkler std + Worksheet 2 | | **Worksheet 2:** Winkler; Assignment 1 chl |
| 3 | Tuesday, September 5, 2017 | LAB:Field prep; chl, nut bottles, BOD | Chlorophyll method handout | | **Worksheet 3:** Winkler standardization |
| 4 | Thursday, September 7, 2017 | LAB:**FIELD #1**: water column; | O2, PAR, nutrients, chl, | | **Worksheet 4:** chl and nutrients |
| 5 | Tuesday, September 12, 2017 | LAB:**FIELD #1**: water column; | O2, PAR, nutrients, chl, | | **Worksheet 4:** chl and nutrients |
| 6 | Thursday, September 14, 2017 | LAB: O2 titrations + Chlorophylls | Winkler titrations + chl a | | **Assignment 2:** chl, Winkler |
| 7 | Tuesday, September 19, 2017 | Computer: PP production worksheet |  | | **Worksheet 5:** PP |
| 8 | Thursday, September 21, 2017 | Computer: O2, light profiles, | Where is O2 going? | | **Worksheet 6:** ODV |
| 9 | Tuesday, September 26, 2017 | LAB: prep experiments O2 consumption | experimental design | |  |
| 10 | Thursday, September 28, 2017 | **FIELD #2:** benthic fluxes | Rankin Lab | |  |
| 11 | Tuesday, October 3, 2017 | Computer lab: benthic O2 flux | Computer experimental O2 fluxes | | **Worksheet 7:** O2 flux calculations |
| 12 | Thursday, October 5, 2017 | LAB: nitrite standards | Make standards; measure nitrite | | **Worksheet 8:** nut standards |
| 13 | Tuesday, October 10, 2017 | LAB: nutrient analyses | Measure NO3-, NO2-, NH4+, PO43- | | **Worksheet 9:** nut protocols |
| 14 | Thursday, October 12, 2017 | Computer Lab: nutrients | Calculate [nut] from std curves | | **Worksheet 10:** nutrient distributions |
| 15 | Tuesday, October 17, 2017 | In situ instruments data | relation to rainfall | | **Worksheet 11** in situ data |
| 16 | Thursday, October 19, 2017 | Acidification Experiments | in class Worksheet hypothesis testing | | **Worksheet 12:** ocean acidification |
| 17 | Tuesday, October 24, 2017 | air-sea gas x-∆ (Edson, Tobias or Vlahos) | in class Worksheet gas exchage | | **Worksheet 13:** gas x-∆ |
| 18 | Thursday, October 26, 2017 | LAB: microscopy (Claudia & Matt) | in class Worksheet cell counts | | **Worksheet 14:** cell counts |
| 19 | Tuesday, October 31, 2017 | Computer: acidification results | acidification results worksheet | | **Worksheet 15:** acidification experiment |
| 20 | Thursday, November 2, 2017 | review |  | | *Review worksheet* |
| 21 | Tuesday, November 7, 2017 | no class, study period |  | |  |
| 22 | Thursday, November 9, 2017 | In-class **TEST;** prep coliform sampling | open book test of concepts thus far | |  |
| 23 | Tuesday, November 14, 2017 | **FIELD #3**: Fecal coliform sampling |  | |  |
| 24 | Thursday, November 16, 2017 | colony count; how to design a poster |  | | **Worsheet 13:** map colony count |
|  | Tuesday, November 21, 2017 | BREAK |  | | **Assignment 3:** Poster outline |
|  | Thursday, November 23, 2017 | BREAK |  | |  |
| 25 | Tuesday, November 28, 2017 | LAB: preliminary poster - student feedback |  | | poster intro and figures due |
| 26 | Thursday, November 30, 2017 | LAB:edit poster |  | | poster finalizing due |
| 27 | Tuesday, December 5, 2017 | LAB:practice poster presentation |  | |  |
| 28 | Thursday, December 7, 2017 | LAB:poster presentation |  | |  |

MARN 4001 2017 schedule