

SYLLABUS: IDS 4930 – Chemical Biomarkers in Aquatic Ecosystems
Spring 2016, Section 1485, Meeting: WH 202,
Wednesday 8th-10th period (3:00-6:00 pm)

INSTRUCTOR

Lead Instructor: Dr Thomas S. Bianchi, Department of Geological Sciences
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COURSE DESCRIPTION

Origins, fates, and distribution of organic compounds in contemporary marine pelagic environments as well as in recent and ancient sediments. Applications and biosynthetic pathways of key chemical biomarkers across a diversity of organic compound classes. New approaches in analytical chemistry and instrumentation currently used in measuring chemical biomarkers.

Prerequisites: none

Course Objectives

At the end of the course, the student will have, based

This course will cover concepts of chemical biomarkers in sediments and natural waters from around the world. It is the aim of this course that by the end, students will have:

- 1) acquired an understanding of the basics of organic geochemical reactions in natural sediments and waters.
- 2) an ability to characterize and potentially utilize individual classes of chemical biomarkers
- 3) an understanding on biomarker structures, biosynthesis, reactivity, and relevant analytical techniques and instrumentation.

Course Structure

The course will require in-class participation. Prior to class each week, students will be expected to keep up with the assigned readings.

COURSE WEBSITE and COMMUNICATION

Course Website

The course will run via **Canvas** through the UF e-learning website; go to <http://lss.at.ufl.edu/> and click on the Canvas Login button. The course site will be used to post relevant announcements, reading, lecture materials, links, assignments and quizzes, etc. You are responsible for checking this site for announcements and to verify that your grades are recorded correctly.

Questions and Comments on course logistics (e.g. assignments, grading etc.) and on content (e.g. science or policy questions directed toward any of the course instructors) should be posted in two respective discussion boards within the course website. Questions of a personal nature (e.g. medical emergency, legal, documented disability accommodation, etc.) should be sent to the TA via e-mail who will forward these to the appropriate faculty instructor as necessary.

Required Textbook

Chemical Biomarkers in Aquatic Ecosystems, by T.S. Bianchi and E.A. Canuel 2011, Princeton University Press (about \$65 to \$85, depending on Amazon prices). In addition, there will be numerous selected readings posted or linked through the course website weekly.

ASSESSMENTS AND GRADING

Final Grade Calculation

20% In-class Activities (presentations and participation in class discussions)

30% Research Paper

50% Mid-term and Final Exams

Final Grade Scale

A = $\geq 93\%$, A- = 90-93.99, B+ = 87-89.99, B = 83-86.99, B- = 80-82.99, C+ = 77-79.99, C = 73-76.99, C- = 70-72.99, D+ = 67-69.99, D = 63-66.99, D- = 60-62.99, E < 60

***Note:** An earned grade of 'C-' grade or below does not qualify for major, minor, Gen Ed, or college basic distribution credit.

For further information on UF's Grading Policy, consult:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Class Discussion

Students will be expected to lead discussion on numerous (depending on size of class) peer-reviewed papers assigned by the instructor. During student presentations all students are expected to have read the assigned paper(s) and to participate in critiquing and assessing the results and impact of the paper.

Exams

There will be mid-term and final exams both of which will be taken in the classroom. Each will be in the format of approximately 6 to 7 essay questions. The final exam will NOT be cumulative.

Homework Assignments

I will assign 2 to 3 recently published scientific papers each week. You will be responsible for reading these papers, some of which you will lead group discussions on throughout the semester - total number to be determined by class size. Each person will also be required to write a review (approximately 200 words) on each paper assigned to them.

Semester Paper

The first assignment (9/21/16) associated with the term paper will include:

- 1) A potential title and a 1 page abstract (single spaced) that clearly defines the topic you have chosen with a general outline of your proposed paper.
- 2) On a separate page, a list of five references you used to put your abstract together. These references will be properly cited in the format of the journal *Limnology and Oceanography* (L&O).

The second assignment (10/19/16) will consist of an annotated bibliography, with 20 properly cited references in the L&O format. Each reference will have a 4 to 5-sentence summary of the important finding in the paper. At least 80% of these references must be from peer-reviewed literature.

The final term paper (12/7/16) will be 15 pages of double-spaced text (excluding title page, tables, figures, references, acknowledgements, and appendices). The format will of the term paper and proposal will strictly follow that of L&O. Please consult the L&O (<http://www.aslo.org/>).

Extra Credit

No mechanisms for extra credit are available.

COURSE AND UNIVERSITY POLICIES

Attendance and Absence

Students are expected to complete all requirements (exams, final paper, presentations) on the specified dates and will not be granted an alternate date unless they have an acceptable reason for their absence (e.g., absences due to medical emergency, observance of religious holidays, military obligation) or pre-arranged consent of the instructor. However, you may receive an extension on an assignment by pre-arranged consent of the instructor or in extraordinary circumstances. These requests must be timely and accompanied by all necessary written documentation.

'In-class activities' must be turned in by the end of the class period that the student had made a presentation. Students are expected to complete all requirements (quizzes, exams, presentation) on the specified dates. However, you may receive an extension on an assignment by pre-arranged consent of the instructor or in extraordinary circumstances. These requests must be timely and accompanied by all necessary written documentation.

Classroom policy

Students are required to bring to each class meeting a laptop or similar device for use in taking notes, summarizing in-class activities, and accessing the internet. However, use of mobile devices and computers during class for purposes other than viewing readings or conducting sanctioned research is not allowed. Cell phones must be turned off during class. Students who receive or make calls or text messages or engage in other disruptive behavior during class will be asked to leave and will not be allowed to turn in the assignment due on that day. Students should also bring pen/pencil and paper to each class.

Academic Honesty Policy

Students must conform to UF's academic honesty policy regarding plagiarism and other forms of cheating. This means that on all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The university specifically prohibits cheating, plagiarism, misrepresentation, bribery, conspiracy, and fabrication. For more information about the definition of these terms and other aspects of the Honesty Guidelines, see <http://www.dso.ufl.edu/sccr/process/student---conduct---honor---code/>. All students found to have cheated, plagiarized, or otherwise violated the Honor Code in any assignment for this course will be prosecuted to the full extent of the university honor policy, including judicial action and the sanctions listed in paragraph XI of the Student Conduct Code. For serious violations, you will fail this course.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

Accommodations for Students with Disabilities

Please do not hesitate to ask for accommodation for a documented disability. Students requesting classroom accommodation must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drp/>). The Dean of Students Office will provide documentation to the student, who must then provide this documentation to the Instructor when requesting accommodation. Please ask the instructor if you would like any assistance in this process. Please provide this information to your TA within the first two weeks of the semester.

Instructor Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Drop/Add/Withdrawal

A student can drop/add during the drop add period with no penalty. After drop/add, a student who drops will receive a W until the date listed in the academic calendar. After that date, the student may be assigned an "E"

(fail). Note: it is the responsibility of the STUDENT to withdraw from a course, not the instructor. Failure to participate/complete the class is NOT a drop.

Additional Resources

Students facing difficulties completing the course or who are in need of counseling or urgent help may contact the Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; or the University Police Department: 392-1111 or 9-1-1 for emergencies.

Other Resources available on-campus for students include:

- a. Student Mental Health, Student Health Care Center, 392-1171, personal counseling;
- b. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual counseling;
- c. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

Course Schedule

Date	Topic	Required Text Reading	Instructor
8/24/16	Metabolic Synthesis	Chapter 1	Bianchi
9/7/16	Biomarker Applications in Ecol. and Paleontol.	Chapter 2	"
9/14/16	Stable Isotopes	Chapter 3	"
9/21/16	Analytical Methods and Instrumentation	Chapter 4	"
9/28/16	Carbohydrates – neutral and simple sugars	Chapter 5	"
10/5/16	Proteins – amino acids and amines	Chapter 6	"
10/12/16	Nucleic Acids and Molecular Tools	Chapter 7	"
10/19/16	Mid-Term	"	"
10/26/16	Lipids: Fatty Acids and Isoprenoids	Chapters 8, 9	"
11/2/16	Lipids: Hydrocarbons alkenones, ether, polar	Chapters 9, 10	"
11/9/16	Lipids: Alkenones, polar and ether lipids	Chapter 11	"
11/16/16	Plant Pigments – chorophylls, carotenoids, phycobil.	Chapter 12	"
11/30/16	Lignins, Cutins, and suberins	Chapter 13	"
12/7/16	Anthropogenic Markers	Chapter 14	"
	Final Exam (TBA)		