**Recommended Course Identification:**

**Prefix** OCC **Course Number** 6050 **Lab Code** (L or C) __

*(TO OBTAIN A COURSE NUMBER, CONTACT jeffjennings@fau.edu)*

**Complete Course Title:** Biological and Chemical Oceanography

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**Grading (Select only one grading option): Regular X Satisfactory/Unsatisfactory**

**Course Description, no more than three lines:** OCC 6050 explores major biological and chemical processes within the world's ocean, including estuaries, continental margins, and the open ocean.

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**Prerequisites:** Graduate standing with Introductory Chemistry (equal to CHM 2045) and Introductory Biology (equal to BSC 1010 and BSC 1011)

**Corequisites:**

**Registration Controls (Major, College, Level):**

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**Minimum Qualifications Needed to Teach This Course: Ph.D. in the Relevant Field**

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Faculty contact, email and complete phone number:
M. Dennis Hanisak & J. William Louda
dhanisak@hboi.fau.edu & blouda@fau.edu
(772) 242-2306 & (561) 297-3309

Please consult and list departments that might be affected by the new course and attach comments.

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**Approved by:**

Department Chair:

College Curriculum Chair:

College Dean:

UGPC Chair:

Graduate College Dean:

UFS President:

Provost:

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**Date:**

Approved by: Date:

02.25.14 3.14.14

1. Syllabus must be attached; see guidelines for requirements:

2. Review Provost Memorandum: Definition of a Credit Hour
   - www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf

3. Consent from affected departments
   (attach if necessary)

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Email this form and syllabus to UGPC@fau.edu one week before the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

FAUnewcrseGrad—Revised September 2013
1. **Course title/number, number of credit hours:**
   Biological and Chemical Oceanography, OCB 6050, 3 credits

2. **Prerequisites:**
   **Required:** Graduate standing, Introductory Chemistry (equal to CHM 2045) and Introductory Biology (equal to BSC 1010 and BSC 1011)
   **Recommended:** Ecology (equal to PCB 4043)

3. **Course Logistics:**
   a. Term: Spring 2015
   b. Online course status: The course is not offered online.
   c. Class location and time: Room MC 209, Johnson Education Center, Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce; Tuesdays and Thursdays 1040 a.m. - 1200 noon

4. **Lead Instructor Contact Information:**
   M. Dennis Hanisak, Ph.D.; Room 135, Lab 2 Building, HBOI-FAU
   Office hours: Friday 11 a.m.; also available in the classroom 15 minutes before and after each class and by appointment
   Phone: (772) 242-2306    E-mail: dhanisak@hboi.fau.edu

   **Co-Instructors Contact Information:**
   J. William Louda, Ph.D.    Phone: (561) 297-3309    E-mail: blouda@fau.edu

5. **TA Contact Information:** None

6. **Course Description:** OCB 6050 explores major biological and chemical processes within the world’s ocean, including estuaries, continental margins, and the open ocean.

7. **Course Objectives/Student Learning Outcomes**
   This course aims to expose students to major biological and chemical processes within the world’s ocean, including estuaries, continental margins, and the open ocean. After completing this course, students should be able to:
   a. Understand important chemical and biological processes occurring in the marine environment and the interactions of these processes
   b. Explain the underlying principles of chemical and biogeochemical cycling in marine systems
   c. Be familiar with the composition and structure of major marine communities
   d. Understand the natural and anthropogenic environmental factors and processes that control the abundances and distributions of marine organisms in space and time
   e. Appreciate the major problems and challenges in biological and chemical oceanography, including climate change
   f. Discern that marine systems are experiencing rapid climate change and predict how marine biota will be affected by future climate changes
   g. Interpret oceanographic observations and intuit cause-and-effect relationships to better understand, manage, and conserve the ocean and its ecosystems
8. Course Evaluation Methods
Final grades will be determined by averaging together grades for four activities:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-Term Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Student Presentations</td>
<td>25%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>25%</td>
</tr>
</tbody>
</table>

9. Course Grading Scale

<table>
<thead>
<tr>
<th>Percentage Score</th>
<th>Grade</th>
<th>Percentage Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>92% - 100%</td>
<td>A</td>
<td>72% - 77%</td>
<td>C</td>
</tr>
<tr>
<td>90% - 91%</td>
<td>A-</td>
<td>70% - 71%</td>
<td>C-</td>
</tr>
<tr>
<td>88% - 89%</td>
<td>B+</td>
<td>68% - 69%</td>
<td>D+</td>
</tr>
<tr>
<td>82% - 87%</td>
<td>B</td>
<td>62% - 67%</td>
<td>D</td>
</tr>
<tr>
<td>80% - 81%</td>
<td>B-</td>
<td>60% - 61%</td>
<td>D-</td>
</tr>
<tr>
<td>78% - 79%</td>
<td>C+</td>
<td>0% - 59%</td>
<td>F</td>
</tr>
</tbody>
</table>

10. Policy on Make-up Tests, Late Work and Incompletes
If a student cannot attend an exam or hand in a homework project on time due to circumstances beyond their control, then the instructor may assign appropriate make-up work. Students will not be penalized for absences due to participation in University-approved activities, including athletic or scholastics teams, musical and theatrical performances, and debate activities. These students will be allowed to make up missed work without any reduction in the student's final course grade. Reasonable accommodation will also be made for students participating in a religious observance. Also, note that grades of Incomplete ("I") are reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances. A grade of "I" will only be given under certain conditions and in accordance with the academic policies and regulations put forward in FAU's University Catalog. The student must show exceptional circumstances why requirements cannot be met. A request for an incomplete grade has to be made in writing with supporting documentation, where appropriate.

11. Special Course Requirements: None.

12. Classroom Etiquette Policy
Per the University's policy on the use of electronic devices: "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions."

13. Disability Policy Statement
In compliance with the Americans with Disabilities Act, students who require reasonable accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD)—in Boca Raton, SU 133 (561-297-3880); in Davie, LA 240 (954-236-1222); in Jupiter, SR 110 (561-799-8010) or at the Treasure Coast Campus, CO 117 (772-873-3441)—and follow all OSD procedures.

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an
unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at: http://www.fau.edu/regulations/chapter4/Reg_4.001_5-26-10_FINAL.pdf

15. Recommended Text/Readings

Textbooks:

Readings:

16. Supplementary/recommended Readings
Thomson, C.W. 1877. The Voyage of the Challenger The Atlantic. A Preliminary Account of the Results of the Exploring Voyage of the H.M.S. Challenger during the Year 1873 and the Early Part of 1876. Volumes 1 and 2. McMillian and Company, London. (PDF will be provided.)

17. Course Topical Outline
1. Introduction: Chemical and biological oceanographic beginnings
2. Seawater, major and minor components
3. Oxidation-reduction reactions and speciation
4. Dissolved gases other than carbon dioxide and gas laws
5. Carbon dioxide, carbonic acid equilibrium, carbonate sediments, and influence of the oceanic conveyor belt
6. Sources/sinks and residence times
7. Redfield concept, nitrogen cycle, and anammox
8. Phosphorus, silica, and iron cycles
9. Carbon and sulfur cycles and their linkages
10. Isotope geochemistry (C, N, H, S, U)
11. Organic biogeochemistry
12. Marine pollution, oil spills and ecotoxicants
13. Marine ecology: fundamental aspects
14. Plankton: primary producers & processes
15. Plankton: microbial loop
16. Plankton: secondary producers/consumers
17. Plankton: trophic dynamics
18. Fish & fisheries: higher tropic levels
19. Coastal oceanography: estuaries/reefs/mangroves
20. Coastal oceanography: coral reefs
21. Benthic processes: Coastal
22. Benthic processes: Deep-sea
23. Challenges in biological & chemical oceanography
24. Global climate change
25. Student presentations

Note: For each lecture, students will be assigned readings from the texts and peer-reviewed publications.