**UNIVERSITY OF SOUTH FLORIDA -- COLLEGE OF MARINE SCIENCE**  
**EVOLUTION AND ECOLOGY OF REEFS**  
**85092  OCG 6668 (614) - 3 credits**  
**Tuesdays 4-7 pm  Location: KRC 3120**

**Instructor:** Dr. Pamela Hallock Muller  
**Office:** MSL 203  
**Phone:** 727-553-1567  
**e-mail:** pmuller@marine.usf.edu  
**Office hours:** by appointment

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading Assignment</th>
<th>Disc. Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 25</td>
<td>Introduction to course &amp; to coral reefs</td>
<td>Veron (2000) p. 19-31; Wells (1957)</td>
<td>PHM</td>
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<tr>
<td>Sept 1</td>
<td>Physical controls on reef growth &amp; reefs through time</td>
<td>Hubbard (pdf); Hallock (pdf)</td>
<td>PHM</td>
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<td>Sept 8</td>
<td>Coral biology</td>
<td>Veron (2000), p 33-43</td>
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<td></td>
<td>Coral –algal aymbiosis</td>
<td>Houlbrèque &amp; Ferrier-Pagès (2009)</td>
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<td></td>
<td>Calcification (see note below)</td>
<td>Stat et al. (2006)</td>
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<td>Sept 15</td>
<td>Microbes and coral reefs</td>
<td>Rosenberg et al. (2007)</td>
<td>JG</td>
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<td></td>
<td>Guest lecture: Julie Galkiewicz</td>
<td>Ritchie (2006)</td>
<td>JG</td>
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<td></td>
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<td>Thurber et al. (2009)</td>
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<tr>
<td>Sept 22</td>
<td>Coral classification</td>
<td>Veron (2000) p. 47-57; VanWoessik (web)</td>
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<td></td>
<td>What are species; species evolution</td>
<td>Veron (2000) p. 424-433, 437-443</td>
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<td></td>
<td>Coral reproduction</td>
<td>Veron 416-421; Guest et al. (2005)</td>
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<td>Hybridization in coral evolution</td>
<td>Karlson (1999) p. 29-50</td>
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<tr>
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<td>Willis et al. (2006)</td>
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**Abstracts/Preproposals Due**

- Oct 6  Algae and primary production
  - Payre (website) 1.
  - Dubinsky and Berman-Frank (2001) 3.
  - Wooldridge (2009a) 4.
- Oct. 13 Coral predators, competitors, bioeroders
- Oct. 20 Guest Lecture: W.C. Jaap – Reef Restoration Mesophotic reefs
  - Jaap et al. (2006) WCJ
  - Lesser et al. (2009) 1.
- Deep-water corals
- Oct. 27 Reef Fish: taxonomy, ecology, management
  - McManus et al. (2000) 2.
  - Munday et al. (2009) 3.
- Nov. 3 Role of disturbance on coral reefs
- Nov. 10 Pleistocene History of Reefs
  - Smithers et al. (2006) 3.
- Nov. 17 Coral reefs and global change
  - Wooldridge (2009b) 1.
- Nov. 24 Guest Lecture: Brian Keller
  - Reef management in face of climate change
  - Cooper et al. (2009) 3.

**Papers Due**

- Dec. 1  Student Presentations

**Reviews Due**

- Dec. 8  Student Presentations
  - Presenters

**Revised Papers Due**

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1
Course Objectives: Coral reefs worldwide are threatened by human activities ranging from local boat groundings to global change processes. The objectives of this course are to examine issues critical to coral-reef growth and preservation. Topics include what coral reefs are, how they are formed, the kinds of organisms that make up the reef community, environmental qualities required for reefs to thrive, a brief introduction to the geologic history of reefs, the importance of coral reefs to mankind, how human activities are affecting coral reefs, and an introduction to reef management.

Grading Policy: See page 6 for specific details for each assignment - late deduction 1 pt/day

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Percentage</th>
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<tr>
<td>Class participation (@ 10 classes x 4 points/class)</td>
<td>40</td>
<td>(20%)</td>
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<tr>
<td>Presenter/Discussion leader (@3 x 20 points/presentation)</td>
<td>60</td>
<td>(30%)</td>
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<tr>
<td>Project</td>
<td>200</td>
<td>(100%)</td>
</tr>
<tr>
<td>Abstract or Proposal (due 9/29)</td>
<td>10</td>
<td>(5%)</td>
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<tr>
<td>Paper (due for review 11/24; final version due 12/8)</td>
<td>40</td>
<td>(20%)</td>
</tr>
<tr>
<td>Project Presentation (12/1 or 12/8)</td>
<td>30</td>
<td>(15%)</td>
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<tr>
<td>Paper reviews (due 12/1)</td>
<td>20</td>
<td>(10%)</td>
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Discussion Leaders: Most weeks, students will be assigned as presenters/discussion leaders. Each student leader will be responsible for presenting and leading discussion on one set of the assigned readings. Recommended format is to spend 15-20 minutes summarizing key points of the reading, adjusted appropriately depending upon the number of presentations or if there is a guest lecture before the presentations. Scoring for discussion leaders will be based on an average of the score assigned by the instructor and class members, deleting the highest and lowest student scores.

Class Participation: The success of the course to enrollees depends on active and enthusiastic preparation for and participation in each class. Each student should bring at least one discussion question for each reading assignment, for discussion by the class after the summary. If you know in advance that you will miss a class, please send two questions per reading by 2 pm on class day so I can take your questions to class for discussion (this will substitute for writing a summary as noted below). Weekly scores will be based upon participation level: 4 point score for active and voluntary participation in discussion; 3 point score for thoughtful discussion when called upon; 2 points for attendance with minimal participation in the discussion.

Attendance Policy: Since 30% of the course grade will be based on weekly participation in discussion of the readings, class attendance is expected. Recognizing research and meeting commitments, students can miss up to two classes without makeup. If you must miss more than two classes, your make-up assignment is to write a one-page synthesis of each reading assigned for that class (unless you submit discussion questions in advance). If you must miss one of your scheduled presentations due to illness, change in work schedule, etc., please e-mail me as soon as possible. If you have some advanced notice to a work-schedule change, please try to arrange a presentation swap with another student. In the event of numerous absences associated with the H1N1 flu or other events, on some occasions we may need to double up on presentations to allow students to make up a missed presentation. Please note that students who anticipate being absent from class due to religious observance should inform the instructor by the second class meeting.

In the event of an emergency (e.g., pandemic or major storm), it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include but are not limited to: Blackboard, Elluminate, Skype, and email messaging and/or an alternate schedule. It’s the responsibility of the student to monitor the Blackboard site for each class for course specific communication, and the main USF, College, and department websites, emails, and MoBull messages for important general information.

Project: The last two class meetings will serve as a mini-symposium for student projects. Each student will

- write an approximately 300-word abstract or preproposal on the chosen topic (due September 29),
b) write a short paper (15 text pages maximum, double-spaced) on that topic (due November 24),
c) make a meeting-style 15-20 minute presentation (December 1 or 8, as assigned),
d) review two papers written by other class members (received November 4, due December 1),
d) turn in your final, corrected paper on December 8.
Advanced students with reef-related research are encouraged to present an aspect of their thesis or
dissertation research, using this venue to prepare a piece of their work for a scientific meeting or for
submission of a paper for publication. Beginning and special students may select to write a literature review
for their possible thesis or dissertation topic. A useful reference on writing literature reviews can be found at
http://www.wisc.edu/writing/Handbook/ReviewofLiterature.html. Students also may choose to write a
research proposal in NSF or other approved format. Science educators may choose to develop a teaching
exercise that presents some aspect of reef biology or geology. When you get an idea for a project, discuss it
with Dr. Hallock Muller in person or by e-mail. More details on grading of abstracts, presentations and
papers is explained on page 6. Oral presentations will be scored by both instructor and class members, final
score will be based on an average of the score assigned by the instructor and class members, deleting the
highest and lowest student scores.

Format and style: Papers should be written in the style required by the journal Coral Reefs as described in
their “Instructions for Authors”. Go to: http://www.springer.com/life+sci/ecology/journal/338 and click on
“Instructions for Authors” in the right-hand column under “For authors and editors”. Proposals should use
the Coral Reefs style for citations and references, but follow the chosen funding-agency format for proposal
Title page, abstract, text, budget and budget justification.

Reading Assignments:

The syllabus, assigned readings and class presentations will be made available on Blackboard.

August 25. Introduction

September 1. Physical Controls and Geologic History
Hubbard, D.K. Reefs as dynamic systems. Revision of the chapter in Birkeland, C. (ed), Life and
Death of Coral Reefs, Chapman and Hall, New York, but the 2nd edition was never published.
(PDF available)
Marine Science, p. 33-43.
Hallock, P. Reefs and reef limestones in Earth history. Revision of the chapter in Birkeland, C. (ed),
Life and Death of Coral Reefs, Chapman and Hall, New York, but the 2nd edition was never
published. (PDF available)

September 8. Coral Biology and Calcification
biology in model systems as the key to understanding corals. Trends in Ecology & Evolution,
23(7): 369-376.
Reviews, 84:1-17.
3. Stat, M., Carter, D., Hoegh-Guldberg, O. 2006. The evolutionary history of Symbiodinium and
scleractinian hosts - Symbiosis, diversity, and the effect of climate change. Perspectives in Plant

**September 15. Guest Lecture: Julie Galkiewicz -- Microbial ecology of coral reefs**


**September 21. Classification, species concept, evolution, reproduction**


1b. van Woesik, R. Coral Taxonomy.
   http://my.fit.edu/~rvw/Taxonomy/Taxonomy%20Introduction.pdf


**September 29. Diversity and Biogeography**


**October 6. Algae and primary production**

1. Payri, C. The algae in French Polynesia: generalities, form and reproduction, reef algae:

   Hawaiian Reef Algae homepage: http://www.botany.hawaii.edu/ReefAlgae/

   Note: The student may use websites, books or other resources in preparing an introduction to marine algae associated with coral reefs.


**October 13. Coral-reef predators, competitors, and bioeroders**


**October 20. Guest lectures - Reef Restoration and Deep-Water Reefs**


**October 27. Reef fish**


**November 3. Role of disturbance on coral reefs**


**November 10. Pleistocene history of reefs**


November 17. Coral Reefs and global change

November 24. Reef Management
Guest Lecture: Brian Keller, NOAA National Marine Sanctuary Program (First half of class time)

Student-led discussions (last half of class time):
### GRADING OF ASSIGNMENTS

**Reading Assignment Discussion Leader:**

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<tr>
<td>Oral presentation</td>
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<td>Creativity in leading discussion</td>
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**Abstract or Preproposal:**

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<tr>
<td>Statement of purpose</td>
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<tr>
<td>Methods sentence(s)</td>
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<td>Anticipated Results</td>
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<td>Significance</td>
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**Project Presentation:**

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**Final Paper:**

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<td>Citations and referencing</td>
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<td>Grammar, spelling</td>
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**Manuscript Review (per manuscript x 2 manuscripts):**

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<tr>
<td>Comments on scientific content</td>
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<tr>
<td>Comments on organization/readability</td>
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<tr>
<td>Corrections of grammar/spelling, etc.</td>
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<tr>
<td>Corrections of citations/referencing</td>
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<td>Total (10 possible)</td>
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MANUSCRIPT APPRAISAL FORM

AUTHOR: 
REVIEWER: 
TITLE: 

INSTRUCTIONS: Please check the appropriate space, adding your comments and suggestions as required. Minor comments and corrections should be marked directly on the manuscript.

CHECK ONE:
(   ) Acceptable without change
(   ) Acceptable with minor changes (explain below)
(   ) Acceptable with major revisions (explain below)
(   ) Unacceptable (explain below)

1. How can this paper be made more appropriate or informative?

2. Is this abstract concise yet informative?

3. How can the manuscript be reorganized for better presentation?

4. How can the text be condensed?

5. Are there any errors of fact or interpretation?

6. How can the illustrations be improved?

7. Can any illustrations, tables, or appendices be omitted?

8. Does the author show adequate awareness of previous work?

9. What, if any, important reference citations were omitted?

10. Is the author diplomatic in handling the opinions of others?