FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL[1]

UGPC APPROVAL _____
UFS APPROVAL _____
SCNS SUBMITTAL _____
CONFIRMED _____
BANNER POSTED _____
CATALOG _____

DEPARTMENT: BIOLOGICAL SCIENCES | **COLLEGE: COLLEGE OF SCIENCE**

RECOMMENDED COURSE IDENTIFICATION:

PREFIX _____PCB____ **COURSE NUMBER** _____6050___ **LAB CODE** (L or C) _____

(TO OBTAIN A COURSE NUMBER, CONTACT MJENNING@FAU.EDU)

COMPLETE COURSE TITLE: Marine and Estuarine Community Dynamics

EFFECTIVE DATE:
(first term course will be offered)
FALL 2015

CREDITS[2]: 3

TEXTBOOK INFORMATION: Marine Ecological Processes. 1995. I. Valiela. Springer Publ. (on reserve) and Marine Community Ecology. 2002. M. Bertness et al. editor. (on reserve)

GRADING *(SELECT ONLY ONE GRADING OPTION)*: **REGULAR** ____X__ **SATISFACTORY/UNSATISFACTORY** _____

COURSE DESCRIPTION, NO MORE THAN THREE LINES: Community, landscape, food web, and similar features of marine systems will be studied. Both basic and applied (conservation and restoration) aspects of communities will be included.

PREREQUISITES *: Graduate standing or Permission of the instructor	**COREQUISITES*:**	**REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:**

** PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.*

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: PH.D. IN THE RELEVANT FIELD

Faculty contact, email and complete phone number:	Please consult and list departments that might be affected by the new course and attach comments.[3]
Dr. C. Edward Proffitt cproffit@fau.edu (772) 242-2207	

Approved by:	*Date:*
Department Chair:	1/30/14
College Curriculum Chair:	2/10/14
College Dean:	2/10/14
UGPC Chair:	2/26/14
Graduate College Dean:	2/26/14
UFS President:	
Provost:	

1. **Syllabus** must be attached; see guidelines for requirements: *www.fau.edu/provost/files/course syllabus.2011.pdf*
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)

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.

Course Syllabus for Marine and Estuarine Community Dynamics for Marine and Estuarine Community Dynamics

1. **Course Title/number and credit hours**
   Course Title, course number and number of credit hours
   Marine and Estuarine Community Dynamics – PCB 6050 – 3 credit hours

2. **Course prerequisites**
   a. Graduate standing
   or
   b. Permission of the instructor

3. **Course logistics**
   a. Term –Fall 2015
   b. Notation if online course – N/A
   c. Class location and time (if classroom-based course) – To be determined

4. **Instructor contact information**
   a. Lead Instructor's name – C. Edward Proffitt
   b. Office address – Department of Biological Sciences, c/o Harbor Branch Oceanographic Institute, Marine Science II room 105, Ft. Pierce, FL
   c. Office hours – To be determined
   d. Contact telephone number – office (772) 242-2207, fax (561) 297-2436
   e. E-mail address – cproffit@fau.edu

5. **TA contact information (if applicable)**
   N/A

6. **Course description**
   This course will cover topics in the ecology of marine and estuarine plant and animal communities. Structure and function in these systems will be explored in the context of relevant ecological hypotheses/theories (topics), such as the stress gradient hypothesis, intermediate disturbance hypothesis, alternate stable states, trophic cascades, biodiversity and global climate change. For example, sessile and sedentary marine species in the intertidal zone possess special morphological, physiological, and/or behavorial traits that allow for survival across the physical stress gradient of flooding and exposure with tidal cycles. The influence of physical factors and interactions on primary producers, and among component species and trophic groups will be one focus of the course. Biological interactions may also vary with tide level from marine species at high tide to terrestrial species at low tide. Furthermore, many terrestrial taxa such as insects and birds have evolved features that promote their use of shallow water marine habitats. Interacting species can also change with season, as some communities include transient species that engage with permanent residents for only a portion of their life cycle. Moreover, in some cases communities can exist in alternate states in time, and dominance can switch from reef (oyster or coral) to algae, depending on environmental stress or disturbance.

   Shifts with global climate change will also be considered for example, salt marsh may give way to mangrove forest in part of the area in which these two systems overlap. We

will examine the importance of shifting and invasive species relative to species interactions, and ecological function in these changing communities

Biodiversity can also affect interactions/links between species, food web complexity as well as the extent and nature of trophic cascades.
Estuaries in particular have high biodiversity. Higher trophic levels are mainly supported by intertidal (mangrove, salt marsh), subtidal (seagrass, macroalgae), and planktonic primary production via pathways ranging from direct grazing of herbivores and carnivores to detritial decomposition. In contrast, many oceanic systems depend on primary productivity from phytoplankton as the base of community structure.

Also, we will examine the role of diversity in dispersal, colonization, shifts with global change, local extinction and stability in different systems. This class will assess species-environment and species-species interactions in different alternative states; and, the cascading effects through ecological functions of differences in those interactions.

7. **Course objectives/student learning outcomes**
In this course an objective of student learning will be species interactions, diversity, and ecological functions of marine and estuarine communities.

Students will be able to: discuss marine and estuarine communities in the context of important and relevant ecological theories.

8. **Course evaluation method**
There will be graded homework project assignments accounting for 60% of the student's cumulative performance. Presentation of results in oral and written form will account for the remaining 20%. Tests will count for 20%.

9. **Course grading scale (optional)**

Cumulative Performance	Grade
>94%	A
>90% - 94%	A-
>87% - 90%	B+
>83% - 87%	B
>80% - 83%	B-
>75% - 80%	C+
>65% - 75%	C
>60% - 65%	C-
>57% - 60%	D+
>53% - 57%	D
>50% - 53%	D-
<50%	F

10. **Policy on late work and incompletes**
If a student cannot and 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 (if applicable)

N/A

12. Classroom etiquette policy (if applicable)

University policy on the use of electronic devices states: "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 (ADA), students who require special accommodation 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, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) – and follow all OSD procedures.

14. Honor Code policy statement

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/chapter4/4.001 Honor_Code.pdf.

15. Required texts/readings

Marine Ecological Processes. 1995. I. Valiela. Springer Publ. (on reserve)

Marine Community Ecology. 2002. M. Bertness et al. editor. (on reserve)

16. Supplementary/recommended readings (optional)

Hammerstrom et al. 2006. Aquatic Bot. 84:110-120. (Halophila seed bank, W. Fla).

Fourqueren et al. 2003. Ecol. Appl. (Ecological Applications) : 13 :474-489. (Fla Bay – monitoring data – model predictions).

Gill et al. 2006. Hydrobiol. 569:427-447. (Nutrients & epiphytes)

Lamote & Dunton. 2006. JEMBE (Journal of Experimental Marine Biology & Ecology): 334:174-186. (Drift algae/light/Thallassia)

McCall and Rakocinski. 2007. Ecology 88: 618-624. (Grass shrimp affects Ruppia).

Currin et al. 1995. MEPS (Mar. Ecol. Prog. Series) 121: 99-116
(importance Stnd Dead S. alterniflora)

Daehler & Strong. 1995. Estuaries 18:409-417. (herbivory & invasive S. altern.)

Morris et al. 2002. Responses of coastal wetlands to rising sea level. Ecology 83(10): 2869-2877.

Pennings, S.C. et al. 2005. Do individual plant species show predictable responses to nitrogen addition across multiple experiments? Oikos 110:547-555.

Brown, E.J., R.F. Harris, and J.F. Koonce. 1978. Kinetics of phosphate uptake by aquatic microorganisms: deviations from a simple Michaelis-Menten equation. Limnol. Oceanogr. 23:26-34.

Bishop, M. and C. Peterson. 2006. Direct effects of physical stress can be counteracted by indirect benefits: oyster growth on a tidal elevation gradient. Oecologia 147: 426–433.

Breitburg, D.L. 1992. Episodic hypoxia in Chesapeake Bay: Interacting effects of recruitment, behavior, and physical disturbance. Ecol. Monographs 62: 525-546.

Feller, I.C. D.F. Whigham · K.L. McKee ·C.E. Lovelock. 2003. Nitrogen limitation of growth and nutrient dynamics in a disturbed mangrove forest, Indian River Lagoon, Florida. Oecologia 134: 405-413.

Pena, M.A., M.R. Lewis, and W.G. Harrison. 1990. Primary productivity and size structure of phytoplankton biomass on a transect bb in the equator 135° W in the Pacific Ocean. Deep-Sea Res. 37:295-315.

17. Course topical outline

- **Physical and environmental gradients affecting marine species and communities (1 week)**
- **Factors affecting primary production and higher order ecological consequences (2 weeks)**
- **Food web dynamics and trophic cascades:**

  - ✓ **coastal ocean (2 weeks)**

- ✓ **estuaries (2 weeks)**

- **Colonization processes and community structure (1 week)**
- **Disturbance and recovery**

  - ✓ **oceanic communities (1 week)**
  - ✓ **estuarine communities (1 week)**

- **Competition in marine and estuarine communities (2 weeks)**
- **Species diversity and community structure and stability (2 weeks)**
- **Effects of global change on community structure, stability, and ecological functions (2 weeks)**