

 <p>NOVA SOUTHEASTERN UNIVERSITY Oceanographic Center</p>	<p>Course Syllabus (Winter 2016 Session I)</p>
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Last Date Revised: September 25, 2015

**I. COURSE NUMBER AND TITLE: OCMB-0996-XXX Marine Larval Ecology
MEVS-5580-XXX Marine Larval Ecology**

Days: **Monday 6:30-9:30 PM**
Building & Room: **Schure Conference Room**

II. INSTRUCTOR:

Joana Figueiredo, Ph.D.
Phone: (954) 262-3638 Email: jfigueiredo@nova.edu
Office: Guy Harvey, 2nd floor, #219
Office Hours: By appointment.

III. COURSE DESCRIPTION:

Most marine animals have a complex life cycle with a sessile or sedentary adult stage and a dispersive larval stage. This course will expose the students to the diversity of marine larval forms and increase their understanding of the environmental factors affecting larval survival, development, dispersal, settlement, recruitment and connectivity. We will study the implications of having a larval stage for the persistence and management of marine ecosystems, and how climate change and other human-induced disturbances on larvae may affect species persistence.

IV. COURSE LEARNING OUTCOMES*:

At the conclusion of this course the student will be able to:

- Identify the predominant types of marine larvae of each marine animal group
- Discuss the ultimate and proximate cues for the synchronization of larval release and its adaptive advantage
- Describe how the major types of marine larvae obtain nutrients and food
- Describe how maternal and environmental patterns may affect the survival, development and dispersal of larvae
- Describe how larval behavior and settlement cues may determine dispersal and recruitment
- Discuss the implications of having a larval stage for population persistence and the importance of considering the larval stage when implementing management for conservation

- Demonstrate knowledge on the effects of climate change and other human-induced disturbances on larvae and how these may affect species persistence
- Analyze and critique scientific literature
- Summarize scientific information
- Demonstrate detailed knowledge of the treated materials and critical thinking ability by questioning or explaining complex processes with regards to marine larval ecology
- Write a grammatically perfect, technically informed, well-structured document on a chosen graduate topic in marine larval ecology
- Deliver a professional, formal presentation on an marine larval ecology topic to a graduate audience

V. REQUIRED TEXTS AND MATERIALS:

No textbook will be required. However, a book that may help you to study is: “Ecology of Marine Invertebrate Larvae” by Larry McEdward, CRC Press (does not cover fish larvae). All themes will be addressed through discussions of relevant scientific articles which will be made available by the professor 5 days before each lecture.

VI. COURSE SCHEDULE AND TOPIC OUTLINE:

Most themes will be introduced in a short lecture, followed by a discussion of scientific articles relevant to the lecture theme. Active classroom discussion on selected scientific articles is mandatory. Relevant questions and themes discussed will be summarized on the board by the students (under the professor’s guidance).

Date	Topic
Jan 4	Diversity of life cycles and larval forms in the sea
Jan 11	Ecological factors affecting spawning and larval release
Jan 15	Maternal effects and larval developmental mode (holiday substitution)
<i>Jan 18</i>	<i>Martin Luther King Day (no class)</i>
Jan 25	Larval feeding and nutrition
Feb 1	Midterm (45min) Environmental factors affecting larval survival and development
Feb 8	Larval transport and swimming behavior
Feb 15	Settlement cues and metamorphosis
Feb 22	Dispersal, Recruitment and Connectivity
Feb 29	Implications of complex life cycles for management of marine ecosystems
March 7	Human-induced effects on larvae and implications for species persistence
March 14	Project: presentation
March 21	Final Project: written component due until Friday

Readings for each class will be posted on Blackboard at least 5 days prior to each class and are mandatory. Note: This is a tentative schedule that may be changed. Students will be provided a minimum one week advance notice of any change when possible.

VII. GRADING CRITERIA

Midterm: 25% (covers lectures up to Week 4: combination of multiple choice, short answer and short-essay questions)

Final: 25% (covers all lectures from the first to last class, with greater emphasis on themes discussed from Week 5 on: combination of multiple choice, short answer and short-essay questions)

Classroom participation: 20% (quantity of quality interventions)

Summaries: 15% total (ca. 200 words synthesis of one of the papers discussed from the previous class) to be handed in in the following class (starting Week 3, relative to papers read the previous week)

Project: 15% (7.5% written + 7.5 % presentation/video).

PROJECT:

- Each student will select one species with a complex life cycle to research its life cycle with emphasis on its larval ecology, including:
 - Description of the species complex life cycle: taxonomic group, habitat, environmental conditions and food source during each life stage
 - Reproduction and Spawning/Larval release: mode(s) of reproduction, timing of reproduction, and timing of larval release (proximate and ultimate factors)
 - Larva: type, characterization of larval development (site of development, nutritional mode, morphogenesis, dispersal potential), feeding and nutrition, swimming and feeding behavior
 - Larval dispersal: planktonic duration, location of habitat for settlement, larval kineses and taxes, settlement behavior and cues.
 - Management: current status, implications of connectivity
 - Environmental conditions larvae are exposed to and its implications for survival, dispersal, population connectivity and management
 - Structure and Originality of presentation/Writing quality
- The written component of the project should have a **4-5 pages (Times New Roman, size 12, 1.5 spacing)** plus references.

Reference formatting

Within the text: All citations in the text should refer to:

1. Single author: the author's name (without initials, unless there is ambiguity) and the year of publication;
2. Two authors: both authors' names and the year of publication;
3. Three or more authors: first author's name followed by 'et al.' and the year of publication.

Citations may be made directly (or parenthetically). Groups of references should be listed first alphabetically, then chronologically.

Examples: 'as demonstrated (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999).

Kramer et al. (2010) have recently shown'

References list: References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication. Examples:

Reference to a journal publication:

Van der Geer, J., Hanraads, J.A.J., Lupton, R.A., 2010. The art of writing a scientific article. *J. Sci. Commun.* 163, 51–59.

Reference to a book:

Strunk Jr., W., White, E.B., 2000. *The Elements of Style*, fourth ed. Longman, New York.

Reference to a chapter in an edited book:

Mettam, G.R., Adams, L.B., 2009. How to prepare an electronic version of your article, in: Jones, B.S.,

Smith, R.Z. (Eds.), *Introduction to the Electronic Age*. E-Publishing Inc., New York, pp. 281–304.

- Project presentation will take place on during **Week 11**. The project can be presented using Powerpoint or ideally a previously recorded video. Each presentation should last **10 minutes**. Students will receive feedback on after the presentation.
- The written component of the project should be handed in until Friday of the last Week of the course.

VII. COURSE REQUIREMENTS AND POLICIES:

ATTENDANCE

As a requirement for accreditation, regular attendance is necessary. Each professor has the responsibility to enforce class attendance. To fulfill this requirement, students must have logged in, accessed, and/or interacted with the majority of online course requirements (e.g. assignment submissions, asynchronous discussion) by the first week of the session or they may be withdrawn from the course by the instructor through the Program Office. For this reason, if students anticipate

or encounter any reason why they may be unable to engage with their online coursework for an extended period during a term, they must communicate this to their instructor and the Program Office as soon as possible. Students do have the option of requesting an Incomplete; if this is granted by their instructor, they then have 3-months from the end of the term date to submit the required course work as decided with the instructor. An incomplete grade agreement form must be completed and filed with the distance education office. An instructor reserves the right to request original written documentation to substantiate any such absences. A falsified excuse is cause for disciplinary action. An Incomplete course graded I must be completed in one semester or the grade is changed to F. All students are referred to the section

3.5.2. of the Oceanographic Center catalog (<http://nova.edu/ocean/forms/nsuoc-2014-2015-catalog.pdf>) for details on course withdrawals and refunds.

ACADEMIC HONESTY

In order to ensure the highest standards of academic honesty and ethical behavior, the NSU policies on cheating and plagiarism will be strictly enforced. See the NSU Student Handbook for more information at <http://www.nova.edu/cwis/studentaffairs/forms/ustudenthandbook.pdf>. I am empowered by the policy to penalize a student suspected of academic dishonesty, plagiarism, or otherwise misrepresenting work and I will do so and report that student to the Dean of the OC. Nova Southeastern University has contracted with **turnitin.com** to provide plagiarism detection services, and I will submit any suspicious documents to this service.

The use of cell phones, or any other electronic devices not specifically allowed by me, during an exam is not permitted. The use of such devices for any reason will be assumed to be for the purposes of cheating and will result in your dismissal from class and administrative action up to permanent expulsion from all NSUOC programs. If you need the phone for emergency notifications, or the like, leave the phone with me or the proctor at the start of class. You will be immediately notified if there is an incoming call.

EXPECTATIONS

You can expect that I will arrive on time for lectures and be well prepared. You can expect that I will be clear about my expectations and the criteria I use in assigning grades and that I will be fair and equitable. I will treat everyone in the class with consideration and respect.

I expect you to come to class, arrive on time, and be prepared for lecture and lab. I expect you to turn off your cell phones, pagers, and hand-held electronic devices as a gesture of reciprocal respect. If you bring a computer to class, I expect you to use it to take notes and record classroom information. I expect you to stay awake, take notes, participate in discussions and ask questions. I expect you to turn in your assignments on time and in good condition.

X: UNIVERSITY-WIDE POLICY STATEMENTS

A. Academic Misconduct: Academic misconduct appears in a variety of forms (including plagiarism). It is a violation of NSU academic policy and may be punished in a variety of ways, from failing the assignment and/or the entire course to academic probation, suspension or expulsion. If you have questions about what constitutes academic misconduct before handing in an assignment, see your instructor or the NSU Student Handbook at <http://www.nova.edu/cwis/studentaffairs/forms/ustudenthandbook.pdf>.

B. ADA Policy: Nova Southeastern University provides accommodations for students with documented disabilities. If you have a disability for which you believe you require accommodation, please contact Academic Services (<http://www.nova.edu/disabilityservices/>, 954-262-7189).

C. Last Day to Withdraw: You will be able to obtain a full refund of your tuition before session II begins, ad 75% refund before the end of the 1st week of Session II. There will be no refund after that date. None of the lab fees is refundable. It is your responsibility to formally withdraw by completing the appropriate forms to obtain a refund (<http://www.nova.edu/ocean/coursepolicy.html>). A request for tuition refund must be made in writing at the time of withdrawal. Refunds will be made solely at the option of the university and will be based on the legitimacy of the reason for withdrawal. Should you fail to appropriately withdraw from this course, and then earn a grade below your expectations, I will do what I can to see that the grade is reported on your transcript.

D. Email Policy: All email communications between students and faculty must be conducted via NSU email accounts (<http://www.nova.edu/common-lib/policies/emailcomm.policy.html>). This requirement will assist NSU in communicating more effectively and protecting your privacy. Emails sent to faculty from non-NSU accounts will be returned to the sender with instructions to resend the communication from your NSU account. To set up an NSU email account or to get help with an existing account, go to https://www.nova.edu/sbin/account_request. Also, the computer help desk is available to assist you with questions regarding your NSU email account. It can be reached at 954-262-HELP (4357).

E. Student Course Evaluations: Student comment and feedback evaluating each college class is an important tool to evaluate program effectiveness. Participation in this process is a responsibility of each student.

F. Grading System

The following system is used to grade academic performance:

GRADE	Percent grade	DESCRIPTION
A	93-100	Excellent
A-	90-92	Very Good
B+	87-89	Good
B	83-86	Satisfactory
B-	80-82	
C+	77-79	
C	73-76	Marginal Pass
C-	70-72	
D+	67-69	
D	65-66	Poor
F	0-64	Failure
W		Withdrawal: Given after the third class week or termination by the instructor for non-completion of the course by the student.
I		Incomplete: Given when most (80 percent), but not all, work has been completed.
Au		Audit
P		Pass

A grade of incomplete (I) must be requested from the instructor, have the Associate Dean's approval, and be accompanied by a **completed contract specifying outstanding course requirements and completion dates**. Completion of the course graded incomplete must occur within one semester (or 3 months) of the end of the course and the incomplete be changed to a different grade. If the course is not completed in 3 months, or the student has not withdrawn and received a W, the incomplete will automatically be converted to a grade of F. Under unusual circumstances students may request a time-extension to complete the course. Such requests must be submitted to, and approved by, the Associate Dean of Academic Programs prior to the end of the 3-month time limit. **There are no exceptions to this rule. Securing the completed and signed incomplete contract forms is the responsibility of the student.**