MBF 713 MARINE POPULATION DYNAMICS

COURSE DESCRIPTION

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COURSE OBJECTIVES

To introduce students to the theory and practice of the quantitative characterization of the processes that regulate, control and affect populations of marine animals, especially those harvested or impacted by fishery harvests. To train students to use population dynamic models to answer resource management questions. Students will be expected to:

1. Familiarize themselves with basic theories of marine population dynamics, including mathematical derivations of basic population models
2. Learn to understand the relative importance of different biological processes in explaining the dynamics of essential “population level” characteristics
3. Develop an understanding of the impact of fishing on the dynamics of marine populations
4. Learn to use statistical and modeling tools to develop hypotheses, estimate parameters, and make predictions about the dynamics of fished systems
5. Introduce the basic concepts required to support single species assessments in support of fisheries management
6. Introduce the basic models that support current population assessment models (to be an introduction to MBF 714)
7. Provide the link between single species assessments and ecosystem assessments.

PREREQUISITES

The only requirement is interest in the topic and a basic level of statistics and mathematics (at the level of MBF 608 and calculus I). Recommended courses prior to MBF 713 are: Calculus II, Fisheries Sampling and Analysis (MBF 645) and Fisheries Population Biology (MBF 646).
COURSE STRUCTURE

The course objectives will be met by a combination of theoretical lectures, weekly assignments, interactive computer sessions and laboratories. The course is divided into two sections and a total of ten chapters. Most weeks will have a theory lecture and either a presentation of a laboratory session or the discussion of a laboratory report. There will be five regular laboratories building up to a special class assignment. Normal laboratory assignment reports will be due the evening (7PM) prior to their discussion in the morning class – so you will have a week to complete each assignment.

As part of the class you will learn about state of the art population assessment models, including SS. SS is a modeling platform developed by NMFS and quickly becoming a standard for fishery stock assessments.

Student progress in reaching these objectives will be assessed through an assessment of participation (including assignments), the testing of knowledge through exams (a midterm and final) and evaluation of laboratory reports.

SUMMARY SYLLABUS

A. First section (for mid-term)
   1. Introduction- dynamics of harvested populations
   2. Estimation of abundance from mark recapture
   3. Estimation of abundance from cpue
   4. Age structured population models

B. Second section
   5. Size based population models
   7. Statistical Catch at age models
   8. Forecasting and population projections
   9. Spatially explicit population models
   10. From multispecies to Ecosystem models

COMMUNICATION

The UM Blackboard system will be used to keep all course materials, provide announcements, maintain a course calendar and communicate with students through email. Students are therefore expected to learn and check blackboard periodically. Power point presentations, reference articles, links to software etc… will all be provided through blackboard. Every student should have received notification that they have been allocated a blackboard account for this class unless you already had one because you were a UM student in a prior semester. We will be recording classes (video signal of the PC screen and audio) and will attempt to provide recordings for you to download and view when you need to review the lectures. These recordings are still experimental and may not be fully reliable so don’t count on them as a substitute for attending the lectures.
GRADES

Final grades will be the result of adding all points obtained from two exams (40 points), laboratories (50 points) and daily participation (10 points). Students must take two exams (each worth 20 points). The midterm exam will cover the first section of the course. The final exam will cover the second section of the course.

REQUIRED READINGS and REFERENCE BOOKS

Required readings will be announced prior to the beginning of each chapter. These readings are meant to provide the student with background knowledge to enhance in-class discussions. A list of these readings will be maintained in blackboard together with the list of reference books.

LABORATORY

Laboratory sessions will be conducted in parallel to the lecture material. Laboratory grades will be provided for each session by evaluating the individual student laboratory reports. Students are expected to have access to personal computers to do reports. Those laboratories that require specialized software the programs will be provided to the student if they are free for distribution.

ATTENDANCE

Attendance is compulsory at all lectures and laboratory sessions. If a student is unable to attend a lecture due to illness or other work he/she should inform instructor prior to the lecture. The instructor will be away from Miami from Sept 21-Oct 2 and Nov 9-18 so lectures on those days will be either rescheduled or taught by invited speakers.

REMOTE DIGITAL ACCESS TO LECTURES

This course is shared through the internet to students from other Universities as part of the “virtual campus” of the Living Marine Resources Cooperative Science Center, a NOAA funded initiative. All lectures and laboratory sessions will be broadcasted through the GOTO MEETING internet service for out of campus students, but UM students can take advantage of this service when they are out of town. Some of the lectures will be delivered from the campuses of LMRCSC partner universities and thus RSMAS students will have to attend them through GOTO MEETING.
How does GOTO MEETING work?

GOTO MEETING is a software platform that allows for users to see a live feed of somebody else’s PC screen. In this case the live feed will be of the PC screen of the RSMAS computer in the RSMAS lecture room for MBF613. In the screen I will display the Powerpoint presentation and any other material that I am sharing with the class. You will also see in the screen a small window with a video of the lecturer. The screen feed is generally one directional so you will see in the remote screen the RSMAS feed but there is no corresponding remote feed that we can see in Miami. The audio, on the other hand, is two way so everybody will hear each other. Audio can be obtained through the computer (voice over IP) or by calling an 1800 number provided with each meeting invitation. So if you don’t have a microphone/speakers you can always call in by phone and hear the whole class like that. I highly recommend getting yourself a set of cheap headphones/microphones (~ $5-$15 models are available) if you plan to regularly connect remotely from outside the UMES classroom. In the right hand side of the screen you will see a small pop-up window for GOTO MEETING with a chat window just in case you want to type a message to the rest of the class (this is an easy way to get my attention). You can also use it to MUTE your microphone and thus reduce audio interference. RSMAS, as originator of the meeting, can also give control of the meeting to other so that we can all see the screen of remote users. In such cases we will not see the RSMAS PC screen until RSMAS takes control of the screen again. We will do this occasionally as required.

How do you connect to GOTO MEETING

You can always connect to any GOTO MEETING event that you have been invited by simply following the invitation link of the meeting that you receive by email. Alternatively, you simply enter the address www.joingotomeeting.com and enter the following meeting ID: 851 169 829 corresponding to the recurrent MBF 713 Fall 2015 class. The first time that you connect to a GOTO MEETING event your PC will download a small application to allow you to connect, other times you will not need to do the download.