Applied Aquaculture Genetics - FAS

(Previously Fish and Shellfish Genetics Taught in 2016)

1. Overview

The goal of this course is to provide students with the background knowledge and practical methodologies for the current technologies used for genetic improvement of fish and shellfish aquaculture and fishery resou[illegible]t. Th[illegible]cour[illegible] combination of online lectures, group discussions, an[illegible]vide[illegible]d[illegible]stra[illegible]or[illegible]to[illegible]stu[illegible]ents with the most updated advancements.

Currently, there is no such course for the Fisheries and Aquatic Sciences (FAS) graduate Program. This course was initiated and developed in 2014 based on a survey and discussion of FAS faculty team, and has been taught in 2016 spring semester (titled as Fish and Shellfish Genetics). Genetics is an important and fast-developing discipline within the science and the practical aquaculture and fisheries. Development of specific stocks with superior performance is the key to increase quantity and quality of aquaculture products, and new generation of analytic techniques can advance the monitoring and management of natural fishery resources. Through this course, students, especially graduate students, from the FAS program can be equipped with the knowledge about genetic basic mechanisms and the current advanced technologies for their future career development. This course also fills the gap in the current FAS graduate curriculum.

- 3 Credits
- 2018 Spring Semester
- Online with synchronous meetings
- http://elearning.ufl.edu/

Course Prerequisites: Basic biology or genetics course and graduate student status.

Instructor: Dr. Huiping Yang

Fisheries and Aquatic Sciences Program (building #544, office #12)
School of Forest Resources and Conservation (SFRC)
7922 NW 71st Street, Gainesville, Florida, 32653
Office phone: 352-294-0671; Email: huipingyang@ufl.edu

- Please use the Canvas message/Inbox feature for fastest response.
- Office hours: available by email or phone; office visits available by appointment.

Teaching Assistant: Natalie Simon

- Please use the Canvas message/Inbox feature for fastest response.
- Office hours: available by email or phone; office visits available by appointment.

Textbook(s) and/or readings: There is no required text for the course. Online readings will be provided for each learning topic. These materials will include published scientific research papers, supplemental readings about general basic principles from Genetics textbook as well as general textbooks in Aquaculture and Fish and Shellfish Biology. Additionally, a list of books are recommended for students as references.

2. Learning Outcomes

At the end of this course, each student will be able to:

- Master the knowledge behind the genetic modifications and improvements
- Understand the genetic approaches and technologies currently applied in aquaculture
- Review and summarize the most updated genetic applications for fish and shellfish aquaculture
- Apply the knowledge from this course for their own research and extension projects
- Develop critical thinking for the fast-developing genetic modifications in aquaculture

3. Course Logistics

This course is entirely web-based and students may access lectures, readings, and supporting materials as they become available each week.

Learning modules consisting of a lecture, readings, supporting material, and a quiz are provided online for each topic. Learning modules build on previous modules so you should complete the learning modules in the order presented.

Each learning module has required readings (usually short papers) beyond the lecture. Live virtual discussion (or discussed board) will be required, each student needs to sign up one topic to moderate the class discussion. In addition, this information will be covered on quizzes and exams. These files will all be made available for you to view on your computer, save, or print. There may be references to additional (optional) readings and resources if you desire further investigation of a topic.

Technology Requirements:

- A computer or mobile device with high-speed internet connection.
- A headset and/or microphone and speakers; a web cam is suggested.
- Latest version of web browser. Canvas supports only the two most recent versions of any given browser. What browser am I using?
- Voicethread: http://ufl.voicethread.com (more instructions will be provided)

3.1 Assignments & Deliverables

Participation

Online watching of the lectures is required, and participation of group discussion is also required.

Quizzes & Exams

Quizzes with multiple or yes/no choices will be posted, and will be due within the lecture week. Scores with the quizzes will be accumulated as a component (30%) of the final score. Group discussion will be also due within the week for each topic on the discussion board, each week the student who sign up to lead the discussion need to wrap up the main points (accounting for a 30% of final score).

The final exam will be a written project proposal. The topic could be any one from this course or any genetic modification related to the students' research major. Minimum two pages (single spaced) are needed with clear statements of the following components: Project Title, Goal, Objectives, Rationale, Strategic Approach, General Methodologies, and Expected Project Outcome. A minimum of 5 references are required (not included in the two pages). The final exam can be finished within the whole semester, due date will be posted online. This will account for a 40% of the final score.

Project/Writing Assignment

No specific writing assignments is required in this course.

Grading Scale (%)
A 90-100
B+ 85-89.99
B 80-84.99
C+ 75-79.99
C 70-74.99
D+ 65-69.99
D 60-64.99
E < 60

3.2 Grades & Grading Scale

30% of Quizzes (10 points each)
30% of group discussion (Learning modules)
40% of the final exam
100 points total

For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

4. Course Content (no tables inserted)

Category 1. Basics

1) Introduction: History and application of genetics on aquaculture and fisheries
2) Basic background: cell cycle, mitosis, meiosis, gametogenesis
3) Molecular genetic basics: DNA, RNA, and Protein

Category 2. Conventional Genetics

4) Inheritance of quantitative and qualitative traits
5) Selective breeding
6) Hybridization, inbreeding

Category 3. Cellular genetics

7) Gynogenesis and Androgenesis
8) Sex manipulations in aquaculture
9) Polyploid in aquaculture

Category 4. Molecular Genetics

10) Genetic markers and genetic mapping
11) Gene expression (RNA, protein), transcriptomes

Category 5. Tools and Techniques

12) Germplasm preservation
13) Flow Cytometer
14) DNA sequencing and DNA sequence based genetic analysis
15) Newly emerging technologies for genetics (discussion)

5. Readings

List of primary literature readings if they are not included in the Course Content section above

6. Policies and Requirements

This syllabus represents current plans and objectives for this course. As the semester progresses, changes may need to be made to accommodate timing, logistics, or to enhance learning. Such changes, communicated clearly, are not unusual and should be expected.

6.1 Late Submissions & Make-up Requests

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx
It is the responsibility of the student to access on-line lectures, readings, quizzes, and exams and to maintain satisfactory progress in the course.

Computer or other hardware failures, except failure of the UF e-Learning system, will not excuse students for missing assignments. Any late submissions due to technical issues MUST be accompanied by the ticket number received from the Helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration.

For computer, software compatibility, or access problems call the HELP DESK phone number—352-392-HELP = 352- 392-4357 (option 2).

6.2 Semester Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning.

At approximately the mid-point of the semester, the School of Forest Resources & Conservation will request anonymous feedback on student satisfaction on various aspects of this course. These surveys will be sent out through Canvas and are not required, but encouraged. This is not the UF Faculty Evaluation!

At the end of the semester, students are expected to provide UF with feedback on the quality of instruction in this course using a standard set of university and college criteria (UF Faculty Evaluations). These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.

6.3 Netiquette: Communication Courtesy

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. Failure to do so may result in loss of participation points and/or referral to the Dean of Students' Office.
http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf

6.4 Academic Honesty Policy

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."*

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied*: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless them instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct or appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated.

Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

6.5 University Policy on Accommodating Students with Disabilities:

Students requesting accommodation for disabilities must first register with the Dean of Students Office (http://www.dso.ufl.edu/drc/). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

6.6 Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

7. Getting Help

For issues with technical difficulties for e-learning in Canvas, please post your question to the Technical Help Discussion in your course, or contact the UF Help Desk at:

- Learning-support@ufl.edu | (352) 392-HELP - select option 2 | http://elearning.ufl.edu
- Library Help Desk support http://cms.uflib.ufl.edu/ask
- SFRC Academic Hub https://ufl.instructure.com/courses/303721

7.1 Student Life, Wellness, and Counseling Help

- Counseling and Wellness resources http://www.counseling.ufl.edu/cwc/

- U Matter, We Care http://www.umatter.ufl.edu/
- Career Resource Center http://www.crc.ufl.edu/
- Other resources are available at http://www.distance.ufl.edu/getting-help for online students.

7.2 Student Complaint Process

The School of Forest Resources & Conservation cares about your experience and we will make every effort to address course concerns. We request that all of our online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered.

If you have a more urgent concern, your first point of contact should be the SFRC Academic Coordinator or the Graduate/Undergraduate Coordinator for the program offering the course. You may also submit a complaint directly to UF administration:

- Students in online courses: http://www.distance.ufl.edu/student-complaint-process
- Students in face-to-face courses: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf