GRADUATE PROGRAMS

IN

THE DEPARTMENT OF FISHERIES AND ALLIED AQUACULTURES

Auburn University

Auburn, Alabama 36849

For additional information contact:

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August 2003

History of the program

Auburn University was chartered in 1856 and was given land-grant status in 1872. In keeping with its land-grant status, the University has a College of Agriculture, the Alabama Agricultural Experiment Station and the Alabama Cooperative Extension System. The Extension System in Alabama is an effort shared between Auburn University and Alabama A&M. The fisheries program is part of the College, Experiment Station and Extension System.

Research in inland fisheries and aquaculture began in 1933 by a team of three scientists headed by Dr. H. S. Swingle. Their focus was on the construction and management of Alabama farm ponds for recreation and for food production. The first formal courses in inland fisheries and aquaculture were offered in 1946 in the Department of Zoology. By 1970, research and teaching activities had developed to a point that a free standing Department of Fisheries and Allied Aquacultures was formed. Today the Department has one of the largest graduate programs at Auburn University and is considered one of the top warm water fisheries and aquaculture programs in the world.

Physical Facilities

Research and teaching facilities for the Department include buildings on the main campus, two research, teaching and extension units near campus, marine research laboratory on the Gulf of Mexico and a Marine Extension and Research Center in Mobile. Main campus facilities located in Swingle Hall include offices, classrooms and laboratories for aquaculture, aquatic ecology, fish health nutrition and genetics, fisheries management, and water quality. A Fisheries Annex located on Wire Road includes offices, training rooms and water quality labs. Four miles north of campus is a field unit that includes 1,730 acres of forested watershed with 320 acres of ponds and small reservoirs, and separate laboratories for fish reproduction, crustacean aquaculture, genetics, health, marketing, nutrition and fisheries ecology and management research. Ten miles south of campus is a 54-acre field unit that includes 36 ponds and teaching laboratory space for fish ecology, behavior, management and conservation work. Marine research facilities include 35 lined, brackishwater ponds, and a hatchery and greenhouse complex at Claude Peteet Mariculture Center in Gulf Shores, Alabama which is available through a cooperative arrangement with the Marine Resources Division of the Alabama Department of Conservation and Natural Resources. The AU Shellfish Laboratory is located at the Dauphin Island Sea lab on Dauphin Island. The Shellfish Facility contains offices and wet and dry labs.

Alabama is a water-rich state, with more than 75,000 miles of streams, 3.6 million acres of wetlands and 490,000 acres of lakes, ponds and reservoirs. These aquatic environments, as well as those found throughout the Southeastern United States provide natural research laboratories for the study of fisheries ecology and management, limnology, fisheries biology, ichthyology and aquatic ecology.

Structure and Affiliations

In keeping with Auburn University's Land Grant Mission, the Department has personnel assigned to teaching, research and extension activities. Most faculty members have split appointments in at least two areas. The teaching faculty is located on the main campus as well as locations served by distance learning centers. Research faculty members are located on main campus and at our coastal facilities. Extension faculty and staff are located on main campus, at the Marine Extension and Research Center in Mobile, the West Alabama Fish Farming Center in Greensboro and at three Research and Extension Centers in the state. In addition to the normal teaching, research and extension programs, there are several closely related programs that involve Departmental faculty and students. These include:

Alabama Cooperative Fish and Wildlife Research Unit (Fisheries Coop Unit), a division of the U. S. Geological Survey, is located at Auburn University. The Assistant Unit Leader for Fisheries is housed on the 1st floor of Swingle Hall, and teaches graduate courses, serves on graduate student committees, conducts research and provides technical assistance and training to State and Federal personnel and other natural resource managers.

Alabama Water Watch (AWW) supports a network of volunteers who monitor water quality in streams, rivers and reservoirs in Alabama. The main office of the program is housed on the 1st floor of Swingle Hall. AWW staff train citizens to collect baseline water quality information that is then received on campus, checked and entered into a computer data base for summary and analysis. The data are used by citizens and state government officials to determine long-term water quality trends and specific problems that need attention. Funding to manage the program is provided by the U.S. Environmental Protection Agency, Alabama Department of Environmental Management, Alabama Experiment Station and Alabama Cooperative Extension System. The coordinator of AWW can serve on graduate committees.

Aquatic Animal Health Research Laboratory is staffed by scientists with the Agricultural Research Service, U.S. Department of Agriculture who work cooperatively with Auburn University. Offices and labs are located on Wire Road, near the College of Veterinary Medicine. The mission of the Lab is to conduct veterinary bacteriological, parasitological, nutritional and immunological research to solve problems in aquaculture that diminish productivity, quality of aquaculture products and profits. Their scientists are affiliates of the Department and can serve on graduate committees (See Affiliate Professors).

International Center for Aquaculture and Aquatic Environments (ICAAE) is a university-based program located on the 2nd floor of Swingle Hall which provides outreach to the international community. Since its inception in 1970, the ICAAE has provided more than 100 person-years of long- and short-term technical assistance in more than 100 countries. The ICAAE staff coordinates global research projects and partnerships with groups in the private sector, and collaborates with governmental agencies, educational institutions and humanitarian organizations. Coordination is provided by an ICAAE

director. Departmental faculty and staff in Fisheries as well as from several other departments at Auburn provide the technical support overseas. The director of the ICAAE is a member of the Fisheries faculty where he teaches and serves on graduate committees.

Sea Grant. Auburn University is a Sea Grant University and the Alabama Sea Grant program of the Mississippi-Alabama Sea Grant Consortium (MASGC) is administered through the Department of Fisheries. Several Departmental positions are supported by Sea Grant funds. Departmental faculty involved with Sea Grant in Mobile and on Dauphin Island can serve on graduate committees.

Southeastern Cooperative Fish Disease Project is supported by state fish and wildlife agencies in the Southeastern U.S. The project is operated from the fish health offices and laboratories on the 2nd floor of Swingle Hall. Departmental faculty and staff of Fisheries provide the technical support for the project which includes a diagnostic laboratory, short courses and research of regional interest.

Southeastern Cooperative Fish Genetics Project is supported by state fish and wildlife agencies in the Southeastern U.S. The project is operated from the genetics laboratory at the North Auburn Fisheries Unit. Departmental faculty and staff of Fisheries provide the technical support for the project that includes genetics projects of regional interest.

Philosophy of Graduate Education

The objective of the graduate program in the Department of Fisheries and Allied Aquacultures at Auburn University is to train professionals through exposure to diverse discipline while maintaining a balance between applied and basic elements. The Department offers graduate programs leading to the Master of Aquaculture, Master of Science, and Doctor of Philosophy degrees.

Graduate degrees are professional degrees that are conferred in recognition of the mastery of a specialized field. Enrollment in graduate school represents a major commitment by students that should be viewed as a period of continued education and the first step in becoming a professional fisheries scientist. Such a commitment requires an investment of time, over a period of years, as well as on a daily basis. For some, this commitment may necessitate a change in lifestyle. Graduate studies also involve innovative work, and in a scientific field such as fisheries, carry the responsibility for original research. Thus, the effort invested by each student in his or her research will directly influence a student's overall success.

The Department of Fisheries and Allied Aquacultures considers the Master of Science degree to be training in a scientific discipline as well as in research. In pursuing an M.S. degree, a student is expected to gain a broad perspective in their discipline of study through course work, master the "art" of research by conducting a specific research project

under the supervision of a faculty advisor, and communicate his/her results with others through scientific reports, journal articles and formal presentations.

The Department of Fisheries and Allied Aquacultures also offers a non-thesis Master of Aquaculture (M.Aq.) degree for students seeking broad practical training in aquaculture and who anticipate a career in aquacultural management. The professional career of most graduates requires competency in both production technology and business. Many candidates have little previous academic training in business, so the M. Aq. program is organized to also provide training in business and economics. Completion of the Master of Aquaculture degree will take approximately two years, including a 3- to 5-month internship.

The Doctor of Philosophy degree is primarily a research degree that is intended to prepare an individual for a life of productive teaching, and/or original research at the frontiers of knowledge. The Ph.D. student applies knowledge from a M.S. or previous experience on how to do research by conducting original research that demonstrates independence in thought and action. Candidates for this degree are expected to bring to their studies a high degree of self-motivation. Currently, the preference of faculty in the Department of Fisheries and Allied Aquacultures is that all Ph.D. candidates have a M.S. degree. This is intended to ensure that Ph.D. candidates have the required experience in scientific writing that comes with completing a thesis. Exceptions to this are allowed in particular circumstances upon approval of the major professor, the student's graduate advisory committee, and the department head. It is not expected that all M.S. students will continue work toward the Ph.D. degree. Candidates must possess or develop the personality and emotional resources to benefit from the highly individual tutorial relationship that ideally develops between the student and the major professor. They must also have the strength to pursue their own specialized interests in an original and creative way with a minimum of direct supervision, and they must learn to maintain their academic and human perspectives while engaging in highly specialized studies.

Doctoral candidates are expected to independently conduct an original research project from conceptualization through publication of results, participate in teaching in the Department, make formal presentations at scientific meetings, and critically review experimental publications.

Students must clearly recognize that employment after Graduate School is competitive and not automatic. The Department aims to help productive, successful students find employment. In return, students must develop a distinguished scholastic record during their work at Auburn University.

Financial assistance in the form of Graduate Research Assistantships (GRAs) is available on a competitive basis from extramural grant sources through individual faculty. Assistantship stipends are not paid solely for conducting thesis or dissertation research. The number of assistantships available depends in great part on the success of departmental faculty in obtaining competitive grants. Students holding assistantships are currently charged in-state resident tuition. There are also a limited number of Graduate

Research Fellowships (GRFs), which will waive in-state tuition, available on a competitive basis. GRFs have set time limits of two years for masters' students and four years for doctoral students.

Assistantships are normally awarded for two years for M.S. students and three years for Ph.D. students. These may be extended by the Major Advisor, depending upon the availability of funds and the demonstration of satisfactory progress toward the degree.

Students on assistantships are assigned duties by their Major Professor or the Department Head, and generally have obligations to the program, contract or grant, from which the assistantship is derived. Students on assistantships receive the same benefits as other University students. Students should understand that there are various categories of assistantships with differing requirements, duties, and obligations. Hence, comparisons among graduate students with regard to duties and time commitment for an assistantship may not be meaningful.

The Department encourages graduate students to attend professional meetings at the regional and national level. When possible, transportation and financial assistance may be provided for such attendance (typically through the advisors contracts and grants), but such funds are not guaranteed. Financial support to attend professional meetings is also available on a competitive basis from the AU chapter of the American Fisheries Society and the AU Graduate School.

Graduate Degrees

The Department of Fisheries and Allied Aquacultures offers three degree options: Master of Aquaculture, Master of Science, and Doctor of Philosophy.

Master of Aquaculture (M.Aq.). The Master of Aquaculture Degree prepares students for a career in aquacultural management and area extension work. The M.Aq. degree requires:

- A minimum of 42 semester hours beyond the bachelors' degree;
- Included in the 42 hours are six core departmental courses (20 hours) and several business-related courses (6 - 12 hours), some of which may be at the undergraduate level.
- A comprehensive oral examination after completion of all course work;
- A 3- to 5-month internship.

Master of Science Degree (M.S.). The Master of Science Degree prepares the student for teaching, research, and extension careers or for further studies toward a Ph.D. The M.S. degree requires:

- A minimum of 30 semester hours beyond the bachelor's degree;
- A minimum of 21 semester hours must be taken in the Department and at least 9 hours taken in related fields outside of the Department;

_ At least half of all credit hours (a minimum of 15 hours) must be earned in courses at the 7000 level and above;
_ A minimum of 4 semester hours of FISH 7990 (Research and Thesis) are required but no more than 6 semester hours may be counted toward the degree;
_ A thesis on a research topic approved by the student's graduate committee;
_ A comprehensive examination on research and course work.
_ A departmental seminar is usually expected.

Doctor of Philosophy Degree (Ph.D.). The Doctor of Philosophy Degree prepares the student for a professional career in teaching, research, and extension. Requirements for the Ph.D. are:

_ A minimum of 60 semester hours beyond the bachelor's degree;
_ A minimum of 30 semester hours must be taken in graded (i.e., A, B, C, D) courses at 7000-level and above;
_ At least 20 semester hours of these graded graduate-level courses must be completed while at Auburn University.
_ The remaining 30 credits may be earned from additional course work (including 6000-level courses, 7990 and 8990).
_ The residency year can be satisfied by completing a minimum of 18 hours of on-campus courses during two consecutive semesters.
_ A maximum of 4 semester hours of FISH 7990 from a completed master's program may be counted toward the minimum credits for the Ph.D.
_ All doctoral students must complete a minimum of 10 hours of FISH 8990 but no more than 10 hours of FISH 8990 can be applied toward the course minimum.
_ A Preliminary Exam must be passed after all course work is completed. The exam is usually combination of written and oral questions.
_ A Final Exam must be passed after research is completed and a draft of the dissertation is complete.
_ A departmental seminar.

Each M.S. student should register for a minimum of one semester hour of Research and Thesis (FISH 7990) and each Ph.D. student must register for a minimum of one semester hour of Research and Dissertation (FISH 8990) every semester an assistantship is held or university facilities are used. During any one semester, the number of hours of FISH 7990/8990 in which the student enrolls should reflect the amount of time being spent on the thesis and the degree to which university resources are being utilized. This includes consultation with the major professor or other faculty or staff. Except under specified circumstances, this requirement is effective even though the student may no longer reside in Auburn.

The Graduate School offers registration in GRAD 7900 ("Thesis Completion" for M.S. candidates) and GRAD 8900 ("Dissertation Completion" for Ph.D. candidates). Enrollment

in GRAD 7900/8900 is for students in the final stages of completing their programs and enables a student to be certified as full-time by the Registrar. Information on registration for GRAD 7900 and GRAD 8900 can be found in the Bulletin (pg 102). Students enrolled in GRAD 7900/8900 must be concurrently enrolled in FISH 7990/8990. Enrollment in GRAD 7900/8900 requires the completion of an application available at the Graduate School or on the web at www.grad.auburn.edu.

Major Professor

Students are advised to discuss and clarify what the expectations for graduate students are of his/her major professor. Specific philosophies and expectations for graduate students vary among major professors; therefore clarification might be needed, for example, about hours of work, computer access, availability of supplies, etc. Faculty who serve as Major Advisors to Masters' students must have "Graduate Faculty Status: Level 1" conferred by the Graduate School; doctoral students must be advised or formally co-advised by faculty with "Graduate Faculty Status: Level 2." (See faculty list)

Graduate Advisory Committee

The Graduate Advisory Committee functions to guide the student through his/her graduate program, especially in assessing suitability and progress of the thesis or dissertation research. The committee has the responsibility for helping the student develop a Plan of Study, Research Proposal and providing guidance toward completion of all degree requirements. The committee must sign the final version of the thesis or dissertation prior to submittal to the Graduate School at the end of the students program. It is the student's responsibility, however, to see that all required forms are filled out, approved when necessary by the Graduate Advisory Committee or Department Head, and submitted to the Graduate School by the designated deadlines.

The Graduate Advisory Committee for students pursuing the M.Aq. or M.S. degrees should consist of the major professor as committee chair and at least two other faculty members. The Advisory Committee for the Ph.D. degree shall consist of the major professor as committee chair and at least three other members. All members of a student's Advisory Committee must be members of the University's Graduate Faculty. Members of a Graduate Advisory Committee are recommended by the major professor in consultation with the student and must be approved by the Department Head.

Students should meet with their Graduate Advisory Committee at least once per calendar year to assess progress toward their degree. It is the responsibility of the graduate student to organize and schedule these evaluation meetings. The student should discuss the format and agenda for the committee meeting in advance with his/her major professor.

Plan of Study

The Plan of Study is an approved list of courses that must be taken in order to satisfy the curriculum requirements for graduation and awarding of the degree. The Plan of Study must be approved by the Graduate Advisory Committee prior to submission to the Graduate School as an official part of the student's file. The appropriate forms to use are noted below. The choice of courses must include the minimum number of course credit hours required by the Department. In selecting courses, the committee should take into account the student's background and previous course work, career goals, and specific courses that will help prepare the student for the thesis or dissertation research to be conducted. When the student and Graduate Advisory Committee have finalized the Plan of Study, the completed form should be given to the members of the Graduate Advisory Committee for their signatures. It is the student's responsibility to then submit the form to the Department Head who will sign and submit it to the Graduate School.

Full-time M.Aq. and M.S. students must submit their Plan of Study to the Graduate School no later than six months from initial enrollment in a graduate program. Ph.D. students should submit their Plan of Study to the Graduate School within twelve months of enrollment in the doctoral program.

The forms used for submitting or revising the Plan of Study are available in the Graduate School, or on the Graduate School web site [www.grad.auburn.edu/forms.htm]. Minor revisions of the Plan of Study can be made with the approval of the Graduate Advisory Committee and the Graduate School, using the form titled Graduate School Revision of Existing Plan of Study. Major changes, however, require submission of a new Plan of Study. Notification and approval of all changes must be provided to the Graduate School before the beginning of the final semester.

Research Proposal

All M.S. and Ph.D. students should prepare a research proposal. The proposal, prepared in consultation with the Major Professor, should include research objectives, a review of relevant literature and the methods by which the research will be conducted. The Graduate Advisory Committee should approve the research proposal before the research begins.

Residence

Residence is defined as living in or near the Auburn-Opelika community and devoting an appreciable portion of time to graduate studies. Residency requirements concern academics only; they have nothing to do with residency for fee purposes.

1. Master of Science Degree: The Graduate School requires that candidates for the Masters' degrees be in residence for at least one semester as a full-time student.
2. Doctor of Philosophy: A significant part of the Doctor of Philosophy program is the residency year. Completing minimum of 18 semester hours of on- campus

course work during two consecutive semesters can satisfy this. Students must file a form with the Graduate School that outlines their residency.

The proposed schedule for accumulation of residency must be submitted to the Graduate School prior to the initiation of the residence period.

Thesis and Dissertation

The thesis for the M.S. and the dissertation for the Ph.D. must be the work of the student. The Thesis and Dissertation Guide, which contains information about requirements for these works, is available in the University Bookstore and on-line under the Graduate School web page. The Graduate School accepts only theses and dissertations prepared according to this Guide. The Graduate School Calendar lists the deadline for acceptance of theses and dissertations by the Graduate School each semester. Each semester the Graduate School conducts a thesis/dissertation workshop. Students should attend this workshop before writing their thesis - usually during the school term preceding their expected date of graduation. The Graduate School will check students' theses/dissertations for format prior to the deadline for each semester. Students are strongly advised to use this service.

General Departmental Operating Procedures

Parking permits. Graduate students with assistantships can obtain a "B" hangtag. See Mary Lou Smith (Rm. 203-C) in the front office for paper work.

Mailbox assignments. Assigned by the Pricilla Butler in Swingle 203. Mailboxes in Rm 204 are for business use only. Personal mail should not be sent to departmental mailboxes.

Desk assignments. Limited desk space is available. Major Professors can request space through the Building Space Assignment Committee, John Grizzle chair.

Issuance of Keys. Keys to student offices and certain labs in Swingle Hall is coordinated through the Major Professor and Mary Lou Smith (Rm. 203-C) in the front office.

Driving Departmental Vehicles. For insurance purposes, students can drive departmental vehicles only after taking the University's Defensive Driving class. Anyone that needs to drive the 15-passenger van must also attend the Van Safety Class. Make arrangements for either course by calling 844-5763 to register or send an email to lohmeje@auburn.edu. September 2003 defensive driving classes are from 2-4 pm at Facilities and will be held on September 9, 17, and 24th. Sign out sheets and keys for the vehicles are in Mary Lou Smith's office (Rm. 203-C).

Departmental Purchases. Purchases can be made with the Major Professor's permission after talking with Theresa Howard (Rm 203-B) to learn proper procedures.

Departmental Travel. All departmental travel must be arranged through the major professor and follow all Auburn University and departmental policies and procedures (http://www.auburn.edu/administration/iss/business_office/policy_manual/travel.html). See Mrs. Phyliss Markle (Swingle Hall, Room 203-D) for departmental procedures.

Fish work and general station use. A 2-hour orientation is mandatory and will be provided at the beginning of each semester. Coordinate training through Randell Goodman or Karen Veverica (844-4667).

Station keys. Keys can be obtained with a written request from the Major Professor to Randell Goodman.

Fishing. Fishing opportunities for graduate students and their immediate families is permitted in certain ponds. Permits are required and must be visible while fishing. Directions and permits can be obtained in Swingle Hall, Rm 203. Note that fishing by friends of fisheries students is not permitted at any time.

Hunting. ABSOLUTELY NO hunting is allowed on Fisheries property.

All safety issues or concerns should be reported immediately to the departmental safety officer, Dr. Allen Davis (844-9312; ddavis@acesag.auburn.edu) and/or the department

head, Dr. David Rouse (844-4786). **ALL** students are required to have a safety orientation. See Dr. Davis for scheduling.

Facility problems: with Swingle Hall should be reported to Mary Lou Smith or Dr. Rouse. Problems at the Fisheries Annex should be reported to June Burns, Mary Lou Smith or Dr. Rouse.

FACULTY

*Faculty in **bold** print can serve on student committees and supervise MS students. Faculty members that are underlined can supervise Ph.D. students.*

Rouse, David B. (Ph.D.). Alumni Professor & Interim Department Head, crustacean and molluscan aquaculture. drouse@acesag.auburn.edu

Arias, Covadonga R. (Ph.D.). Assistant Professor, microbial genomics. ariascr@acesag.auburn.edu

Bayne, David R. (Ph.D.) Professor, aquatic ecology, limnology. dbayne@acesag.auburn.edu

Boyd, Claude E. (Ph.D.) Butler Cunningham Eminent Scholar and Professor, water and aquatic soil chemistry. ceboyd@acesag.auburn.edu

Brady, Yolanda J. (Ph.D.) Associate Professor, aquatic animal health. Graduate Program Officer and Academic Coordinator. ybrady@acesag.auburn.edu

Chappell, Jesse A. (Ph.D.). Assistant Professor & Aquaculture Extension Specialist, aquaculture production systems. chappj1@auburn.edu

Daniels, William (Ph.D.). Associate Professor & Director of the Master's of Aquaculture program, aquaculture production systems. wdaniels@acesag.auburn.edu

Davis, D. Allen (Ph. D.) Assistant Professor, aquatic animal nutrition. ddavis@acesag.auburn.edu

DeVries, Dennis R. (Ph.D.). Professor, fish ecology, fisheries management, conservation and ecology of endangered species. ddevries@acesag.auburn.edu

Duncan, Bryan L. (Ph.D.). Professor & Director ICAAE. bduncan@acesag.auburn.edu

Dunham, Rex A. (Ph.D.). Alumni Professor, fish genetics. rdunham@acesag.auburn.edu

Grizzle, John M. (Ph.D.). Professor, fish pathology. jgrizzle@acesag.auburn.edu

Irwin, Elise (Ph.D.) Associate Professor and Assistant Unit Leader, Cooperative Fisheries Unit. riverine ecology. eirwin@acesag.auburn.edu

Jensen, John W. (Ph.D.) Interim Dean, Professor, & Aquaculture Extension Specialist. jjensen@acesag.auburn.edu

Johnston, Carol E. (Ph.D.). Associate Professor, Behavioral Ecology and Conservation, cjohnsto@acesag.auburn.edu

Liu, Zhanjiang (John) (Ph.D.). Alumni Associate Professor, molecular biology. zliu@acesag.auburn.edu

Lovshin, Len L. (Ph.D.). Professor, aquaculture, llovshin@acesag.auburn.edu

Maceina, Michael J. (Ph.D.). Professor, fisheries management. mmaceina@acesag.auburn.edu

Phelps, Ronald P. (Ph.D.). Associate Professor, hatchery management. rpphelps@acesag.auburn.edu

Swann, LaDon (Ph.D.) Assistant Research Professor and Director of Mississippi Alabama Sea Grant Consortium, Dauphin Island, Alabama. lswann@acesag.auburn.edu

Szedlmayer, Stephen T. (Ph.D.) Associate Professor & Extension Marine Specialist, fish ecologist, Gulf Coast Substation, Fairhope. sszedlma@acesag.auburn.edu

Terhune, Jeff (Ph.D) Assistant Professor. Epidemiology. jsterhune@acesag.auburn.edu

Wallace, Richard K. (Ph.D.). Professor & Extension Marine Specialist, fisheries management and oyster biology. Auburn University Marine Extension Research Center, Mobile, Alabama. rwallace@acesag.auburn.edu

Wright, Russell A. (Ph.D.). Associate Professor & Extension Fisheries Specialist, recreational fisheries management, rwright@acesag.auburn.edu

AFFILIATE PROFESSORS

Bader, Joel A. (Ph.D.) Affiliate Assistant Professor. USDA - ARS Aquatic Animal Health Laboratory. Auburn, AL.

Evans, Joyce J. (Ph.D.) Affiliate Assistant Professor USDA- ARS, Aquatic animal Health Research Laboratory, Chestertown, MS. Joyce.Evans@washcoll.edu

Freeman, Mary (Ph.D.) Affiliate Assistant Professor, stream ecology. Athens, Georgia. mfreeman@acesag.auburn.edu

Delaney, Mary (Ph.D.) Affiliate Assistant Professor. USDA - ARS Aquatic Animal Health Laboratory. Auburn, AL.

Klesius, Phillip H. (Ph.D.) Affiliate Professor, USDA - ARS Aquatic Animal Health Laboratory, Auburn, AL.

Lim, Chhorn. (Ph.D.) Affiliate Professor, fish nutrition. USDA - ARS Aquatic Animal Health Laboratory, Auburn, AL., limchh@mindspring.com

Shelby, Richard A. Affiliate Assistant Professor, Affiliate Assistant Professor, molecular biologist. USDA - ARS Aquatic Animal Health Laboratory Auburn, AL., reshelby@ars.usda.gov

Shoemaker, Craig A. (Ph.D.) Affiliate Assistant Professor, molecular biologist. USDA - ARS Aquatic Animal Health Laboratory Auburn, AL. shoemca@vetmed.auburn.edu

Webster, Carl (Ph.D.) Affiliate Professor, aquatic animal nutrition, Kentucky State University, Frankfort, Kentucky. cwebster@dcr.net

RESEARCH AND EXTENSION SUPPORT ON-CAMPUS

Castro, Michelle (M.S.). Research Assistant, fish ecology Castro, Michelle (B.S.), Research Assistant, Behavioral Ecology and Conservation, castrmi@acesag.auburn.edu

Deutsch, William G. (Ph.D.). Research Fellow & Extension Specialist, aquatic ecology and Program Manager, Alabama Water Watch, wdeutsch@acesag.auburn.edu

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OFF-CAMPUS

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Chaplin, Glen (M.S.). Ag Program Assistant, marine ecology. AU Marine Extension and Research Center, Mobile. chaplgi@acesag.auburn.edu
Cline, David J. (M.Aq.). Extension Specialist, aquaculture. Auburn.
dcline@acesag.auburn.edu
Ferry, Amy (B.S.). Research Assistant. marine fish reproduction. Claude Peteet Mariculture Center. Gulf Shores.
Goodman, Randell K. (M.S.). Superintendent, North Auburn Fisheries Unit.
rgoodman@acesag.auburn.edu
Hemstreet, William, G. (M.S.). Research Associate. Alabama Fish Farming Center, Greensboro. whemstre@acesag.auburn.edu
Kucuktas, Huseyin (Ph.D.). Research Fellow, molecular genetics.
Maus, David L. (M.S.). Research Associate. Claude Peteet Mariculture Center, Gulf Shores. mausdav@auburn.edu
Page, B. A. (B.S.). Research Assistant, AU Marine Extension and Research Center, Mobile. bpage@acesag.auburn.edu
Reeves, Claude E. (M.Aq.). Extension Specialist, aquaculture. Headland.
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Rikard, F. Scott (M.S.). Program Associate, Auburn University Shellfish Lab, Dauphin Island. frikard@acesag.auburn.edu
Scanlan, Jody A. (M.S.). Ag Program Assistant. AU Marine Extension and Research Center, Mobile. scanlja@auburn.edu
Veverica, Karen L. (M.S.). Research Associate, North Auburn Fisheries Research Station, aquaculture. kveveric@acesag.auburn.edu
Waters, Phillip L. (M.S.). Ag Program Assistant, aquaculture. AU Marine Extension and Research Center, Mobile. waterph@acesag.auburn.edu
Whitis, Greg N. (M.Aq.). Extension Specialist, aquaculture. Alabama Fish Farming Center, Greensboro. gwhitis@acesag.auburn.edu

Fisheries and Allied Aquacultures (FISH)
Courses for Graduate Students

6120. PROFESSIONAL AND RESEARCH ORIENTATION (2). LEC. 2. Fall. Concepts of professionalism, professional ethics, technical writing, research design and operations.

6210. PRINCIPLES OF AQUACULTURE (3). LEC. 3. Pr., BIOL 1030. Fall. Principles underlying aquatic productivity and levels of management as demonstrated by present practices of aquaculture around the world.

6215 MARINE AQUACULTURE (2) LEC. 3, LAB 2. Pr. BIOL 1030. Introduction to culture of marine species with emphasis in nutrition and feeding, reproductive biology, production techniques, processing, marketing and economics of commercial culture. Dauphin Island Sea Lab. Summer, First Term.

6220. WATER SCIENCE (3). LEC. 3. Pr., FISH 2100, CHEM 1040 or departmental approval. Fall. Properties of water, the water cycle, basic water chemistry and water quality with emphasis on water in managed ecosystems.

6240. HATCHERY MANAGEMENT (4). LEC. 2, LAB. 8. Pr., FISH 6210. Spring. Study of warm-water hatchery techniques and application of those techniques in the field.

6250. AQUACULTURE PRODUCTION (4). LEC. 3, LAB 4. Pr., BIOL 1030. Summer. Factors affecting growth and yield of aquacultural species, with implications toward farming commonly cultured species. Production techniques for commercially important finfish are discussed.

6320. LIMNOLOGY (4). LEC. 3, LAB 6. Pr., CH 1040, BIOL 1030, and FISH 2100 or departmental approval. Spring. Biological, chemical and physical factors affecting aquatic life.

6380. GENERAL ICHTHYOLOGY (5). LEC. 3, LAB. 6. Pr., BIOL 1030. Fall. Survey of the biodiversity of world and local fishes, with an overview of ecology, behavior, biology and conservation of fishes.

6410 INTRODUCTION TO FISH HEALTH (2). Pr., BIOL 1030. Fall. Introduction to parasitic, bacterial, and viral pathogens of wild and cultured finfish and shellfish.

6425 MARINE FISH DISEASES (4) LEC. 7.5, LAB 6. Pr. BIOL 1030. Introduction to diseases of marine finfish and shellfish and practical techniques used to isolate and identify diseases. Dauphin Island Sea Lab. Summer, First Term.

6510. FISHERIES BIOLOGY AND MANAGEMENT (3). Pr., BIOL 1030. Fall. An overview of fisheries management with particular emphasis on freshwater examples introducing students to the basic tools and complex issues of fisheries.

6520. SMALL IMPOUNDMENT MANAGEMENT (3). LEC. 5, LAB 10. Pr., Summer, 5 weeks. BIOL 1030. This course introduces major aspects of primarily recreational fishing pond management, including construction, stocking, water quality management, harvest strategy, diagnosis of problems and communication of analyses.

6630. FACILITIES FOR AQUACULTURE (3). LEC. 2, LAB. 4. Fall. Principles and practice of site selection, design and construction of aquacultural facilities, with emphasis on impoundments and ponds.

6650. FISH AND SEAFOOD PROCESSING TECHNOLOGY (3). LEC. 3. CHEM 2030, BIOL 3200. Summer. Emphasis on important species, market forms, preservation techniques, and rules and regulations of the seafood industry.
6670. FISHERIES AND AQUACULTURE EXTENSION METHODS (2). Summer. Concepts and practices pertaining to aquacultural extension organization, administration, program development and implementation.
6725. MARINE ICHTHYOLOGY (6). Pr., BIOL 3060, FISH 6380 and departmental approval. Summer. General background in biology of marine fishes and their taxonomy. Offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.
6735. PRINCIPLES OF MARINE AQUACULTURE (6). Pr., 16 credits in biology. Summer. Principles and technologies for culture of commercially important marine organisms. Offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.
6745. MARINE FISHERIES MANAGEMENT (4). Pr., departmental approval. Summer overview of practical marine fishery management problems. Offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.
6975. SPECIAL TOPICS IN MARINE FISH DISEASES (3). Pr., BIOL 3200 or departmental approval. Summer. Infectious and non-infectious diseases of marine fish and shellfish. Taught at Dauphin Island Sea Lab.
7030. ADVANCED ICHTHYOLOGY (6). LEC. 6, LAB. 32, Pr., BIOL/FISH 6380. Summer, second term. 5 week course. Survey of biodiversity of freshwater fishes in the southeastern United States through intensive field sampling. Credit will not be given for both FISH 7030 and BIOL 7030.
7230. WATER AND SEDIMENT QUALITY MANAGEMENT IN AQUACULTURE (4). LEC. 3, LAB 3. Pr., FISH 6220 or department approval. Fall, even years. Advanced treatment of water and sediment quality management in aquaculture. Analytical methods for soil and water quality.
7270. CRUSTACEAN AND MOLLUSCAN AQUACULTURE (3). LEC. 3, Pr., FISH 6210 or departmental approval. Spring. General biology and culture techniques of the major shrimp, crawfish and shellfish species cultured throughout the world.
7330. RESERVOIR LIMNOLOGY (3). LEC. 2, LAB 5. Pr., FISH 6320. Summer, even years. Consideration of the ecological characteristics of reservoirs as they relate to modern concepts of ecosystem management.
7340. FISH ECOLOGY (3). Lec. 2, Lab. 3. Pr., ZOOL 3060 or equivalent. Fall, even years. Study of interactions among fish and their environment. Laboratory will emphasize critical literature reading and experimental approaches.
7360. MANAGEMENT OF AQUATIC FLORA IN FISHERIES AND AQUACULTURE (4). LEC. 3, LAB 6. Pr., BIOL 6120 or equivalent or departmental approval. Summer, odd years. Role of aquatic vegetation in fish production, its utilization and control.
7380. ECOLOGY AND MANAGEMENT OF RIVERINE SYSTEMS (4). Pr., BIOL 7370. Spring. Odd years. This course provides a framework for natural resource professionals to examine river systems within a landscape ecology and ecosystem management context. Laboratory sessions stress techniques for assessment and management.

7420. FISH DISEASES (4). LEC. 3, LAB. 4. Pr., BYMB 3200, and FISH 6410. Fall. Provides information and diagnostic techniques for viral, bacterial, fungal and parasitic diseases of fish of the world with an emphasis on those of North America. Lectures will cover etiologic agents, geographical range, species susceptibility, clinical signs, pathology, epidemiology, control and management.

7440. FISH ANATOMY AND PHYSIOLOGY (3). LEC. 2, LAB. 3. Pr., FISH 6380. Spring. Advanced studies of fish anatomy and physiology. Emphasis on teleosts and topics of importance in fishery biology, aquaculture, and fish health.

7450. FISH PATHOLOGY (3). LEC. 2, LAB 3. Pr., FISH 6410, 7440. Fall, even years. Morphological and physiological changes in fish with infectious or noninfectious diseases.

7460. CLINICAL FISH DISEASE DIAGNOSIS (1-3). Pr., FISH 6410. All semesters by arrangement. Provides practical experience in necropsy of diseased fish, identification of causative agents and appropriate disease control.

7530. FISH POPULATION DYNAMICS (3). LEC. 2, LAB. 4. Pr., FISH 6510, STAT 6010. Spring, even years. Derivation of fish population estimates, growth, recruitment and mortality; use of modeling techniques to assess exploited fish populations.

7540. QUANTITATIVE TECHNIQUES IN FISHERY ASSESSMENT (3). LEC. 2, LAB 4., Pr., FISH 6510, STAT 6010, 6110, 7010 or departmental approval. Spring, odd years. Quantitative techniques to assess and manage fish populations in freshwater. The laboratory will analyze actual fisheries data using SAS on personal computers.

7640. FISH NUTRITION (3). Pr., ANSC 7210. Summer. Fundamental and applied aspects of fish nutrition, including nutrient requirements, physiology of food assimilation, feed preparation, and practical feeding.

7641. FISH NUTRITION LABORATORY (2). LAB. 6, Coreq. FISH 7640. Summer. Laboratory exercises in analysis of fish feeds, and formulation and preparation of fish feeds.

7650. FISH GENETIC ENHANCEMENT AND RESOURCE MANAGEMENT (3). LEC. 3. Pr., BIOL 3000. Fall, odd years. Basis of genetic enhancement in aquatic animals by selective breeding, genome manipulation and genetic engineering, genetic maintenance and conservation.

7660. MOLECULAR GENETICS AND BIOTECHNOLOGY (4). LEC. 3, LAB. 3. Pr., BIOL 3000 or equivalent. Fall, even years. Principles and application of DNA fingerprinting technologies, gene mapping, genetic information and analysis using internet tools, transgenic technologies.

7755. BIOLOGICAL OCEANOGRAPHY (3). Pr., Graduate status, admission by DISL. LEC. 3, LAB. 2. Spring. Comprehensive survey of marine organisms and their biological interactions. Taught at Dauphin Island Sea Lab.

7920. INTERNSHIP IN FISHERIES AND AQUACULTURE (Var.). Pr., Departmental approval. Field experience in aquaculture, fisheries or aquatic resource management on farm or with research, extension or aquatic management agency.

7950. SEMINAR (1). Graded S-U. Acquaint students with current research and related activities.

7970. SPECIAL PROBLEMS (1-5). (CREDIT TO BE ARRANGED). Individualized work and study in consultation with faculty member on problem of mutual concern. May include directed readings and research.
7990. RESEARCH AND THESIS (CREDIT TO BE ARRANGED).
8950. SEMINAR (1). Graded S-U. Acquaint students with current research and related activities.
8970. SPECIAL PROBLEMS (1-5). (CREDIT TO BE ARRANGED). Individualized work and study in consultation with faculty member on problem of mutual concern. May include directed readings and research.
8990. DOCTORAL RESEARCH AND DISSERTATION (CREDIT TO BE ARRANGED).

IMPORTANT CONTACT NUMBERS

EMERGENCY NUMBERS

Emergency fire, police, ambulance, etc. – 911 (On and Off Campus)

Auburn University Medical Clinic - 844-4416 or 844-4422
http://www.auburn.edu/au_medical/index.html

Auburn University Police Department - 844-4158
www.auburn.edu/police

Auburn University Numbers and Web Addresses

Auburn University Bookstore - 844-4241
www.auburn.edu/bookstore

Auburn University Library - 844-4500 or 844-1738
www.lib.auburn.edu

Bursar's Office – 844-4634
www.auburn.edu/administration/iss/businessoffice/control/bursars/bursar.html

College of Agriculture - 334/844-2345:
http://www.ag.auburn.edu/

Foy Student Union – information - 844-4244. Obtain numbers for clubs, academic and religious organizations
www.auburn.edu/foy

Graduate School – 844-4700
www.grad.auburn.edu

I.D. Card Office – 844-4507
https://frontpage.auburn.edu/tigercard/

Information Technology – Help Desk - 844-4944
www.auburn.edu/oit

International Student Life –844-2401 - Nejla Orgen - Office
844-5751 James Hardin - Office
http://www.auburn.edu/academic/other/international_education/office/issmainpage.htm

International Student Organization - 844-2724
http://www.auburn.edu/student_info/iso/

Office of International Education - 844-5001
http://web6.duc.auburn.edu/academic/other/international_education/office/ (Immigration documents)

Recreation Services – 844-4716
www.auburn.edu/recservices

Registrar – 844-4770
www.auburn.edu/registrar

Student Affairs – 844-5810
http://www.auburn.edu/student_info/student_affairs/

Student Government Association - 844-4240
www.auburn.edu/sga

Tiger Transit – 844-4757 or 844-4760
www.auburn.edu/transit

Auburn City Numbers and Web Addresses

Alabama Department of Public Safety – 742-9986 (Driver's license)
http://www.dps.state.al.us/

Auburn City Post Office - 1-800-275-8777
www.usps.com

Social Security Administration - 1-800-772-1213
www.ssa.gov