

Approval Form

Proposal Title: Ichthyology

Sponsor(s) L.S. Hales, Ph.D. Dept.: Biological Sciences Ext. 3555

Check one: Course Specialization Concentration Minor Achievement Certificate
 Certification Program Major Program Minor Change (please name deletion or credit/title/catalog change)

Undergraduate Graduate 4 Credit Hours

<p>Step 1 (Department)</p> <p><input checked="" type="checkbox"/> Approved <u>Oct. 27, 1997</u> Date</p> <p><input type="checkbox"/> Not Approved</p> <p><u>E. J. Moore</u> Dept. CC Chairperson</p> <p><input checked="" type="checkbox"/> Reviewed <u>Oct. 27, 1997</u> Date</p> <p><u>E. J. Moore</u> Dept. Chairperson</p>	<p>Step 2 (Receipt)</p> <p><input type="checkbox"/> SCC# <u>9748-107</u></p> <p>Proposal Received <u>10-24-97</u> Date</p> <p>_____ SCC Chairperson</p>	<p>Step 3 (School CC)</p> <p>Reviewed <u>11-19-97</u></p> <p><input type="checkbox"/> Approved <input type="checkbox"/> Not Approved</p> <p>Comments:</p> <p>_____ School Curr Comm Chairperson</p>
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Step 4 (Academic Dean) **Comments:**

Recommend
 Not Recommend
 Conditionally Recommend (see comments)

Reviewed _____ Date

_____ Signature, Dean of School

Step 5 (SCC)

Open Hearing 2-2-98 Approved by Senate Curriculum Committee _____ Date

Returned to sponsor(s) for the following reasons:

Step 6 (Senate)

Presented to Senate 2-2-98 Approved Not Approved
Date

Notification to Executive Vice President/Provost 2/27/98 Janette M. Deves
Date Signature, SCC Chairperson

Step 7 (Executive V.P./Provost)

Received _____

Date

If no, reasons are as follows.

Approved Yes No

Student credit hours _____

Faculty load hours _____

Equalized credit hours _____

Official copy and approval sheet filed 3/3/98
Date

[Signature]
Signature, Executive Vice-President/Provost

Registrar

Approved course description received _____
Date

Hegis Taxonomy and Course Number assigned 0401-470

[Signature]
Signature, Registrar

3/3/98
Date

Notification forwarded:

- Senate Curriculum Committee Chairperson
- Department Chairperson(s)
- Academic Dean(s)
- Registrar
- Sponsor(s)

Transmittal
3/5/98

NEW COURSE PROPOSAL
BIOL 0401.4xx\ ICHTHYOLOGY

1. Details:

- a. Course Title: Ichthyology (BIOL 0401.4xx)
- b. Sponsors: Department of Biological Science
L. Stanton Hales, Jr., Ph.D., Assistant Professor
- c. Credit Hours: four s. h.
two weekly lectures, 1.25 hrs. each; one weekly laboratory session including some Saturdays
- d. Course Level:
Undergraduate; senior-level HEGIS number requested.
- e. Curricular Effect:
This course is designed to expand the number and diversity of zoology courses that are a degree requirement for the Biology Major; this course will be one option within the Zoology requirement of the Biology Major. This course will ease the classroom and laboratory demands on other zoology courses, and expand the variety of courses relevant to marine sciences. This course will facilitate use of the Cape May County property, acquired by the university in support of marine and environmental field courses and student research.
- f. Prerequisites:
The prerequisites for this course are Biology I and II (BIOL 0401.100 and 0401.101), and senior-class standing or permission of the instructor.
- g. Suggested Time and Scale of Implementation:
Effective Summer, 1998. This laboratory course requires extensive travel, and thus can accommodate a maximum of only 15 students. This course will be taught in fall at Rowan University as part of the regular departmental offerings; it may be offered periodically in summer.
- h. Adequacy of Present Staff, Resources, Library Facilities:
Dr. Stan Hales, a new faculty member in the Department of Biology, was hired to develop this and other courses for the biology curriculum.

Departmental resources for this course are adequate: Dr. Hales has obtained a boat from the New Jersey Marine Sciences Consortium, and the College of Arts and Sciences has contributed \$5,000 for an outboard motor. This course will utilize the university's recently acquired property in Cape May County, and will likely stimulate additional use of this site.

Library resources are adequate for this course.
- i. Short-term Evaluation:
The success of this course will be evaluated in the same manner as all other courses in the department, by a variety of means including, but not limited to, student evaluations.

2. Rationale:

Fishes, with more than 20,000 extant species, are the most diverse vertebrate class in the world and have affected human biology and culture for many years. Despite their importance to natural systems and humans, fishes are the only vertebrate group whose study is not included in the curriculum at Rowan University. The current course is proposed to address this shortcoming and enhance the

zoology offerings for senior students majoring in biology. Thus, this course will complement the existing courses in zoology (herpetology, ornithology, mammalogy, invertebrate zoology, and entomology), and will likely generate student interest in other environmental and marine-related course offerings.

3. Essence of the Course:

a. Objectives:

This is a laboratory zoology course for senior students majoring in biology; thus, it is designed to satisfy the zoology course requirement for all biology majors. The objectives of this course are the following: 1) to introduce students to the biology of fishes, including their evolution, systematics and taxonomy, organismal biology, life history and ecology; and 2) to provide students with extensive opportunity to develop research and analytical skills. This latter objective necessitates the senior-class standing of students. By that time, students should have been introduced to most mathematical concepts used in this course (distribution and abundance assessment, linear and curvilinear functions, frequency distributions, rate models, etc.) through other classes. Laboratory and field exercises are designed 1) to survey the ichthyofauna of both freshwater and marine habitats of New Jersey and the northeastern United States, 2) to introduce students to current techniques, approaches, and topics in ichthyology, and 3) to provide regular opportunities to collect and analyze a variety of environmental and biological data.

b. Topical Outline/Content:

Introduction: What's a fish?

Evolution and survey of fishes: systematics and taxonomy

The major groups of fishes: jawless fishes, early gnathostomes (placoderms, acanthodians, *etc.*), chondrichthyans, lobe-finned fishes, and actinopterygians

Survey of modern fishes

Organismal biology of fishes

Skeleton, musculature and locomotion

Circulation, respiration and buoyancy

Excretion and osmoregulation

Feeding, nutrition, and indeterminate growth

Reproduction, parental care and sex determination

Development and metamorphosis

Nervous system and sensory organs

Population, species, and community ecology

Aqueous environments and habitats

Migration

Larval ecology and recruitment

Freshwater and marine zoogeography

Genetics

Endangered species and species conservation

Exotic species introduction and control

Laboratory schedule

Morphology, meristics and morphometry

Distribution and abundance

Respiration and oxygen concentration

Osmoregulation and buoyancy

Age and growth

Reproductive biology

Feeding biology

Parasitism

Sensory biology

Habitat choice and predation risk

Behavior and communication

Likely field trips

lakes, low order streams, riverine habitats, estuaries and coastal bays, Delaware Bay and the continental shelf off New Jersey

Camden Aquarium, Academy of Natural Sciences in Philadelphia

c. Evaluation and Grading Procedure of Students:

Students will be graded on the basis of their performance on a variety of assignments; minimally, these will include several hour-long tests, laboratory reports, and a final exam. In addition, students may be assigned one or more papers of varying lengths and an oral presentation.

d. Course Evaluation:

The Department of Biological Sciences routinely review its courses to assess course success in meeting the goals and objectives of the course, department, and college.

4. Results of Consultation:

No other course in the department has similar content; no other department at Rowan University offers a course with similar content. Dr. Rudy Arndt, Professor of Biology and Marine Science at Richard Stockton College, has generally taught this course through the New Jersey Marine Science Consortium. He is currently unable to meet existing demand for this course at Richard Stockton College. Dr. Roger Wood, Director of Research at the Wetlands Institute in Stone Harbor, believes that a number of summer interns at the Wetlands Institute are likely to enroll in this course when it is taught in the summer.

5. Possible textbooks and laboratory manuals for this course:

There are a number of recently published texts that may be used for this course, including Gene Helfman's (1997) Diversity of Fishes, Carl Bond's (1996) Biology of Fishes, and Moyle and Cech's (1982) Fishes: An Introduction to Ichthyology. Potential laboratory manuals for this course are numerous.

6. Catalog Description:

See next page.

COURSE DESCRIPTION

BIOL 0401.4xx Ichthyology

(Prerequisites: BIOL 0401.100 and 0401.101, and senior-class standing or permission of the instructor.)

This course is a senior-level zoology course designed to introduce students to the fundamental aspects of the biology of the major groups of fishes. Topics to be discussed in class include taxonomy and systematics of the major groups of fishes, a survey of modern fishes, their basic structure and function, behavior, and ecology. Lab exercises are designed to introduce students to current methods, approaches, and topics; field exercises are designed to survey the diversity of fishes and their habitats in New Jersey and nearby states.