

# Biological Sciences

## Faculty:

For a complete list of current, active Biology Department Faculty see [http://biology.fau.edu/home/departmental\\_faculty.php](http://biology.fau.edu/home/departmental_faculty.php)

Murphey, R., Chair; Baldwin, J.; Benscoter, B.; Binninger, D.; Brooks, W. R.; Caruso, J.; Dorn, N.; Esiobu, N.; Frazier, E.; Gawlik, D.; Godenschwege, T.; Hartmann, J. X.; Hughes, C.; Jia, K.; Kajiura, S.; Koch-Rose, M.; Kumi-Diaka, J.; Lyons, H. J.; Milton, S.; Narayanan, R.; Neonburg, E.; Proffitt, E.; Salmon, M.; Theisen, T.; Weissbach, H.; Wyncken, J.; Zhang, X.H.

The Department of Biological Sciences offers undergraduate degree programs leading to the Bachelor of Arts (B.A.) degree and Bachelor of Science (B.S.) degree. A grade of "C-" or better (unless otherwise noted in the course description) is required in all biology AND cognate courses taken as part of the requirements for an undergraduate degree in Biological Sciences. However, students must maintain a "C" average in departmental major courses. The department also offers an Honors Program, a minor in Biological Sciences and an undergraduate certificate program in Biotechnology. A Bachelor of Science (B.S.) in Neuroscience and Behavior is offered jointly with the Department of Psychology. This major is detailed under the [Psychology Department section](#).

Master's-level degree programs include the Master of Science (M.S.), the Master of Science in Teaching (M.S.T.) and a [Professional Science Master's Degree in Business Biotechnology](#).

Two combined programs are also available. In one, students earn a B.S./M.S. in Biological Sciences and in the other, a [B.S. in Biological Sciences and an M.S. in Environmental Science](#).

## Recency of Undergraduate Credits Transfer Policy

No credits more than 10 years old may be transferred into or applied to an FAU Biology undergraduate program. Any credits that are transferred in are considered earned in the first semester of enrollment at FAU.

[Link to Bachelor of Science Program](#)

[Link to Additional Undergraduate Offerings](#)

[Link to Combined Programs](#)

[Link to Master's Programs](#)

## Bachelor of Arts Degree

*(Minimum of 120 credits required)*

The Bachelor of Arts (B.A.) degree is intended to provide maximum flexibility for students pursuing study in interdisciplinary areas such as environmental science or secondary school teaching. In addition to the University and College degree requirements, students seeking a Bachelor of Arts degree in Biological Sciences must complete the following core requirements. All degree programs require a total of 120 credits, 45 of which must be upper-division credits.

## Prerequisite Coursework for Transfer Students

Students transferring to Florida Atlantic University must complete both lower-division requirements (including the requirements of the Intellectual Foundations Program) and requirements for the college and major. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the baccalaureate degree, students must also complete the prerequisite courses for their major as outlined in the [Transfer Student Manual](#).

All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.

<b>Core Requirements</b>		<b>40-41</b>
Biological Principles and Lab	BSC 1010, 1010L	4
Biodiversity and Lab	BSC 1011, 1011L	4
General Chemistry 1	CHM 2045	3
General Chemistry 1 Lab	CHM 2045L	1
General Chemistry 2	CHM 2046	3
General Chemistry 2 Lab	CHM 2046L	1
Organic Chemistry 1	CHM 2210	3
Organic Chemistry 2	CHM 2211	3
Methods of Calculus	MAC 2233	3
Experimental Design and Statistical Inference	PSY 3234	3
Physical Science	PSC 2121	3
<b>Select at least three four of the following four courses below:</b> <i>(additional courses selected from within this category beyond the four courses may be applied toward the below elective requirement)</i>		
Genetics	PCB 3063	4
<del>Molecular and</del> Cell Biology	PCB <del>4023</del> 3023	3
Principles of Ecology	PCB 4043	3
Evolution	PCB <del>4674</del> 3674	3
<b>One course in Physiology to be selected from:</b>		
Principles of Plant Physiology and Lab	BOT 4503, 4503L	4
Comparative Animal Physiology and Lab	PCB 4723, 4723L	4
Comparative Vertebrate Morphogenesis and Lab	ZOO 4690, 4690L	5
Human Morphology and Function 1 and Lab	PCB 3703, 3703L	4
Human Morphology and Function 2 and Lab	PCB 3704, 3704L	4

<b>Biology Electives</b>		<b>15</b>
<b>Select at least 15 a minimum of 12 upper division credits from the list below:</b>		
<del>Biochemistry 1</del>	BCH 3033	3

Vascular Plant Anatomy and Lab	BOT 3223, 3223L	4
Marine Botany and Lab	BOT 4404, 4404L	4
Plant Cell Biology	BOT 4542	3
Plant Biotechnology	BOT 4734C	3
*Life of a Biologist	BSC 2844	1
Conservation Biology	BSC 3052	3
Introduction to Biological Research	BSC 3453	1
Biological Research	BSC 3481	2
Molecular Genetics of Aging	BSC 4022	3
Biotechnology 1 Lab	BSC 4403L	2
Biotechnology 2 Lab	BSC 4427L	2
Concepts in Bioinformatics	BSC 4434C	3
Biology of Cancer	BSC 4806	3
**Directed Independent Study	BSC 4905	1-3
**Directed Independent Research	BSC 4916	0-3
Honors Research	BSC 4917	3
Honors Thesis	BSC 4918	3
Comparative Animal Behavior	CBH 4024	3
Special Topics- (Model Systems Genetics Lab)	BSC 4930	1-3
Organic Chemistry Lab	CHM 2211L	2
General Microbiology and Lab	MCB 3020, 3020L	4
Medical Bacteriology	MCB 4203	3
Virology	MCB 4503	3
Microbial Ecology	MCB 4603	3
Marine Biodiversity and Lab	OCB 4032, 4032L	4
Marine Biology and Lab	OCB 4043, 4043L	4
Marine Microbiology and Molecular Biology and Lab	OCB 4525, 4525L	4
Marine Ecology and Lab	OCB 4633, 4633L	4
Marine Science	OCE 4006	4

Issues in Human Ecology	PCB 3352	3
Genetics Lab	PCB 4067L	3
Immunology	PCB 4233	3
Freshwater Ecology and Lab	PCB 4301, PCB 4301L	4
Molecular Genetics	PCB 4522	3
Genes and Development	PCB 4594	3
Reproductive Endocrinology	PCB 4803	3
Cellular Neuroscience and Disease	PCB 4842	3
Practical Cell Neuroscience	PCB 4843C	3
*Invertebrate Zoology and Lab	ZOO 2203, 2203L	5
*Vertebrate Zoology and Lab	ZOO 2303, 2303L	4
Functional Biology of Marine Animals and Lab	ZOO 4402, 4402L	4
Ornithology and Lab	ZOO 4472, 4472L	4
Topics in Ornithology	ZOO 4479C	1-4
Principles of Human Neuroanatomy ZOO 4742	ZOO 4742	3

**Note:** PHY 2053 may be substituted for PSC 2121.

\*Although they are biology electives, Life of a Biologist (BSC 2844), Invertebrate Zoology and Lab (ZOO 2203+L), and Vertebrate Zoology (ZOO 2303+L) are not upper division courses and, as such, do not fulfill the minimum biology upper division elective requirement of 12 credits.

\*\*Students may enroll in a maximum of 3 research credits within a single semester.

Note: No more than 5 total non-graded (S/U) credits may be used to fulfill biology degree program requirements. Approved non-graded biology electives include:

Directed Independent Study	BSC 4905	1-3
Directed Independent Research	BSC 4916	0-3
CMBB Research Seminar	BSC 4905	1
Professional Internship	IDS 3949	0-1

**Note:** CMBB Research Seminar is a 1 credit, semester long course. No more than 2 credits (2 semesters) of CMBB Research Seminar may be used to fulfill biology degree program requirements.

**Note:** Biology department approval is required for students wishing to complete Professional Internship for credit. Once a student's Professional Internship registration request has been processed by the FAU Career Center, the Career Center will communicate directly with the department to request approval on the student's behalf.

**Note:** Students wishing to participate in Shadowing/Medical Externship should not enroll in Professional Internship. They should instead enroll in Medical Externship Shadowing (IDS 3940). The Medical Externship Shadowing course cannot be used to fulfill Biology degree program requirements.

**Note:** The maximum number of credits which may be earned through CO-OP is 10 credits; the Department of Biological Sciences does not allow these credits to be applied toward degree requirements of the major. Students interested in cooperative learning experiences should pursue a Professional Internship (IDS 3949).

Students should consult the biology website regarding additional courses that may be applied toward fulfillment of their degree requirements. Students can find up to date information about new courses as they become available on the biology website at <http://biology.fau.edu/academics/quickesttriptoabachelorsdegree.php>.

### Environmental Sciences Focus

Complete all of the above and the following electives.

<b>Biology Elective</b>		
Issues in Human Ecology	PCB 3352	3 or
Environment and Society	EVR 2017	3

<b>General Electives</b>		
Macroeconomics	ECO 2013	3
Microeconomics	ECO 2023	3
Environmental Economics	ECP 4302	3
Environmental Ethics	PHI 3640	3

### Bachelor of Science Degree

*(Minimum of 120 credits required)*

The Bachelor of Science (B.S.) degree is recommended for students planning to be professional biologists in industry or governmental service, for graduate work in the biological sciences and for students planning careers in medicine, dentistry or veterinary medicine. In addition to the University and College degree requirements, students seeking a Bachelor of Science degree in Biological Sciences must complete the following degree requirements.

### Prerequisite Coursework for Transfer Students

Students transferring to Florida Atlantic University must complete both lower-division requirements (including the requirements of the Intellectual Foundations Program) and requirements for the college and major. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the baccalaureate degree, students must also complete the prerequisite courses for their major as outlined in the [Transfer Student Manual](#).

All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.

<b>Core Requirements (47-49 credits)</b>		
Biological Principles and Lab	BSC 1010, 1010L	4
Biodiversity and Lab	BSC 1011, 1011L	4
General Chemistry 1 and Lab	CHM 2045, 2045L	4
General Chemistry 2 and Lab	CHM 2046, 2046L	4
Organic Chemistry 1	CHM 2210	3
Organic Chemistry 2	CHM 2211	3
Methods of Calculus	MAC 2233	3 or
Calculus with Analytic Geometry 1	MAC 2311	4
College Physics 1	PHY 2053	4 or
General Physics 1	PHY 2048	4
College Physics 2	PHY 2054	4 or
General Physics 2	PHY 2049	4
General Physics 1 Lab	PHY 2048L	1
General Physics 2 Lab	PHY 2049L	1
Experimental Design and Statistical Inference	PSY 3234	3 or
Introduction to Biostatistics	STA 3173	3
<b>Select at least three four of the courses below</b> <i>(additional courses selected from within this category beyond the four courses may be applied toward the below elective requirement)</i>		
Genetics	PCB 3063	4
Molecular and Cell Biology	PCB 4023	3
Principles of Ecology	PCB 4043	3
Evolution	PCB 4674	3
<b>One course in Physiology to be selected from:</b>		
Principles of Plant Physiology and Lab	BOT 4503, 4503L	4
Comparative Animal Physiology and Lab	PCB 4723, 4723L	4
Comparative Vertebrate Morphogenesis and Lab	ZOO 4690, 4690L	5
Human Morphology and Function 1 and Lab	PCB 3703, 3703L	4
Human Morphology and Function 2 and Lab	PCB 3704, 3704L	4

<b>Electives (select at least 24 select a minimum of 18 UPPER DIVISION credits from the list below)</b> <i>(The Department of Psychology and Department of Biological Sciences jointly administer the Neuroscience and Behavior major. Thus, Biology majors may choose electives from that program list as well.)</i>		
Biochemistry 1	BCH 3033	3
<b>Biochemistry 2 OR Biochemistry Lab</b>	<b>BCH 3034 OR BCH 3103L</b>	<b>3</b>
Vascular Plant Anatomy and Lab	BOT 3223, 3223L	4
Marine Botany and Lab	BOT 4404, 4404L	4
<b>Plant Cell Biology</b>	<b>BOT 4542</b>	<b>3</b>
Plant Biotechnology	BOT 4734C	3
<b>*Life of a Biologist</b>	<b>BSC 2844</b>	<b>1</b>

Conservation Biology	BSC 3052	3
Introduction to Biological Research	BSC 3453	1
Biological Research	BSC 3481	2
Molecular Genetics of Aging	BSC 4022	3
Biotechnology 1 Lab	BSC 4403L	2
Biotechnology 2 Lab	BSC 4427L	2
Concepts in Bioinformatics	BSC 4434C	3
Biology of Cancer	BSC 4806	3
**Directed Independent Study	BSC 4905	1-3
**Directed Independent Research	BSC 4916	0-3
Honors Research	BSC 4917	3
Honors Thesis	BSC 4918	3
Special Topics- (Model Systems Genetics Lab)	BSC 4930	1-3
Comparative Animal Behavior	CBH 4024	3
Organic Chemistry Lab	CHM 2211L	2
Critical Thinking in Environmental Science	EVS 4021	3
General Microbiology and Lab	MCB 3020, 3020L	4
Medical Bacteriology	MCB 4203	3
Virology	MCB 4503	3
Microbial Ecology	MCB 4603	3
Marine Biodiversity and Lab	OCB 4032, 4032L	4
Marine Biology and Lab	OCB 4043, 4043L	4
Marine Microbiology and Molecular Biology and Lab	OCB 4525, 4525L	4
Marine Ecology and Lab	OCB 4633, 4633L	4
Marine Science	OCE 4006	4
Issues in Human Ecology	PCB 3352	3
Genetics Lab	PCB 4067L	3
Immunology	PCB 4233	3
Freshwater Ecology and Lab	PCB 4301, PCB 4301L	4
Molecular Genetics	PCB 4522	3
Genes and Development	PCB 4594	3
Reproductive Endocrinology	PCB 4803	3
Cellular Neuroscience and Disease	PCB 4842	3
Practical Cell Neuroscience	PCB 4843C	3
*Invertebrate Zoology and Lab	ZOO 2203, 2203L	5
*Vertebrate Zoology and Lab	ZOO 2303, 2303L	4
Functional Biology of Marine Animals and Lab	ZOO 4402, 4402L	4
Ornithology and Lab	ZOO 4472, 4472L	4
Topics in Ornithology	ZOO 4479C	1-4
Principles of Human Neuroanatomy	ZOO 4742	3

\*Although they are biology electives, Life of a Biologist (BSC 2844), Invertebrate Zoology and Lab (ZOO 2203+L), and Vertebrate Zoology (ZOO 2303+L) are not upper division courses and, as such, do not fulfill the minimum biology upper division elective requirement of 12 credits.

\*\*Students may enroll in a maximum of 3 research credits within a single semester.

Note: No more than 5 total non-graded (S/U) credits may be used to fulfill biology degree program requirements. Approved non-graded biology electives include:

Directed Independent Study	BSC 4905	1-3
Directed Independent Research	BSC 4916	0-3
CMBB Research Seminar	BSC 4905	1
Professional Internship	IDS 3949	0-1

**Note:** CMBB Research Seminar is a 1 credit, semester long course. No more than 2 credits (2 semesters) of CMBB Research Seminar may be used to fulfill biology degree program requirements.

**Note:** Biology department approval is required for students wishing to complete Professional Internship for credit. Once a student's Professional Internship registration request has been processed by the FAU Career Center, the Career Center will communicate directly with the department to request approval on the student's behalf.

**Note:** Students wishing to participate in Shadowing/Medical Externship should not enroll in Professional Internship. They should instead enroll in Medical Externship Shadowing (IDS 3940). The Medical Externship Shadowing course cannot be used to fulfill Biology degree program requirements.

**Note:** The maximum number of credits which may be earned through CO-OP is 10 credits; the Department of Biological Sciences does not allow these credits to be applied toward degree requirements of the major. Students interested in cooperative learning experiences should pursue a Professional Internship (IDS 3949).

Students should consult ~~their faculty adviser~~ the biology website regarding additional courses that may be applied toward fulfillment of their degree requirements. Students can find up to date information about new courses as they become available on the biology website at <http://biology.fau.edu/academics/quickestriptoabachelorsdegree.php>.

## Honors in the Major: Biological Sciences

### Biology Honors Thesis Program

The Department of Biological Sciences offers an Honors Thesis Program that recognizes research accomplishments of talented undergraduates. Eligible students must have a minimum of 20 credits in biology and an overall GPA of 3.2. Students usually begin the program in their junior year and conduct independent, supervised research during their junior and senior years. A written paper and a seminar describing the results of their research are required in the senior year. Interested students should contact the faculty member whose research interests are closest to those the student wishes to pursue.

### Biology Honors Research Program

The Department of Biological Sciences offers an Honors Research Program that recognizes research



accomplishments of talented undergraduates. Eligible students must have a minimum of 20 credits in biology and an overall GPA of 3.2. Students usually begin the program in their junior year and conduct independent, supervised research during their junior and senior years. Submission of a grant proposal is required no later than the second semester of the junior year. Presentation of a poster or seminar at a local, regional, national or international research conference/symposium describing the results of their research is required in the senior year. Interested students should contact the faculty member whose research interests are closest to those the student wishes to pursue. For more information, see <http://biology.fau.edu/academics/undergraduate/research.php>.