

 FLORIDA ATLANTIC UNIVERSITY	NEW/CHANGE PROGRAM REQUEST Graduate Programs		UGPC Approval _____ UFS Approval _____ Banner _____ Catalog _____
	Department _____ College _____		
Program Name	New Program* Change Program*	Effective Date (TERM & YEAR)	
Please explain the requested change(s) and offer rationale below or on an attachment.			
*All new programs and changes to existing programs must be accompanied by a catalog entry showing the new or proposed changes.			
Faculty Contact/Email/Phone		Consult and list departments that may be affected by the change(s) and attach documentation	
Approved by Department Chair _____ Sarah L. Patton College Curriculum Chair _____ [Signature] College Dean _____ [Signature] UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____		Date _____ 8/1/2023 _____ 8/28/2023 _____ 08/28/2023 _____ _____ _____ _____	

Integrative Biology Doctor of Philosophy (Ph.D.)

Red = strikethrough
Blue = new changes

Biomedical Science Concentration
Environmental Science Concentration
Marine Science and Oceanography Concentration
Neuroscience Concentration

(Minimum of ~~80~~ 72 credits required)

Integrative biology refers to interdisciplinary, multilevel approaches to education and research in the biological sciences. The Integrative Biology program focuses on the relationship between cell/molecular functions and experimental biology in the broad sense, with a view to connectivity between levels of biological organization and biological processes. Core courses and research elements will emphasize this theme. The curriculum is individually tailored to each student's research interests and built around a set of core courses that emphasize 1) the theme of integrative biology, 2) scientific communication, 3) statistics, 4) elective courses chosen by the student and ~~an advisory~~ a supervisory committee, 5) seminar courses and 6) dissertation research.

The Department of Biological Sciences, the Charles E. Schmidt College of Medicine, the College of Engineering and Computer Science, the Harriet L. Wilkes Honors College, the Center for Molecular Biology and Biotechnology, the Brain Institute, and Harbor Branch Oceanographic Institute participate in this doctoral program. ~~FAU's Partner Institutions—the Max Planck Florida Institute for Neuroscience, The Scripps Research Institute of Florida, the Torrey Pines Institute for Molecular Studies and the Vaccine and Gene Therapy Institute—also contribute expertise to this program.~~ FAU's Partner Institution, the Max Planck Florida Institute for Neuroscience, also contributes expertise to this program.

Those applicants seeking a doctorate in Integrative Biology may choose to pursue the Integrative Biology core program (IBIO) or pursue one of the program's four concentrations: Neuroscience (IBNS), Environmental Science (IBES), Biomedical Science (IBBS) or Marine Science and Oceanography (IBMO). These concentrations fall under the umbrella of the Integrative Biology major and all students accepted to the concentrations are subject to all Integrative Biology policies and regulations as well as additional regulations ~~that are~~ specific to each concentration.

Neuroscience Concentration (IBNS)

Completion of the Neuroscience concentration provides students with both knowledge and practical experience in the neuroscience field at an advanced level. In the evolving and growing field of neuroscience, students who complete the IBNS concentration will have the appropriate training to succeed both within and outside of academia. The Neuroscience curriculum focuses strongly on knowledge-based and experimental-based neuroscience courses and includes training in scientific methodologies. IBNS faculty are active experts in their respective neuroscience fields and ~~will support development of the student who can focus on~~ provide students with research opportunities in a broad range of areas ~~a number of research areas~~, including neuronal circuitry, synaptic plasticity, learning and memory, cognitive and behavioral neuroscience,

neurodegeneration, [neuroimmunology](#), drug ~~discover~~, [discovery](#), stress neurobiology, neurogenetics and ~~or~~ neurodevelopment.

Environmental Science Concentration (IBES)

Completion of the Environmental Science concentration provides students with advanced research and technical training that prepares them to find solutions to some of the world's most difficult environmental problems. Habitat degradation, invasive species, contaminants and climate change challenge land and water managers in South Florida and indeed the world. IBES faculty have considerable experience conducting research to address these difficult conservation problems, particularly in South Florida's extensive freshwater and marine ecosystems. The IBES curriculum emphasizes experiential learning through dissertation research, combined with innovative courses in the fields of ecology, conservation biology, environmental chemistry, geographic information systems, statistics and modeling.

Biomedical Science Concentration (IBBS)

Completion of the ~~IBBS~~ [Biomedical Science](#) concentration provides students with advanced knowledge and research experience in the biomedical science field. The IBBS curriculum focuses strongly on both knowledge-based and experimental-based biomedical science courses and teaches ~~the student~~ [students](#) appropriate scientific methodology. Students who complete the IBBS concentration develop the skills and expertise they need to succeed both within and outside academia. IBBS faculty are active experts in their respective biomedical science fields and ~~support development of the students' research in the areas of Human Genetics and Genomics; Cancer Biology and Prevention; Microbiology, Immunology and Infectious Disease; HIV/AIDS Mechanisms and Treatments; Respiratory Physiology and Biophysics; Age-Related Eye Diseases including Cataract and Age-Related Macular Degeneration; Breast Cancer Mechanisms and Therapy; Cardiometabolic Risk in Psychiatry; Huntington's Disease Mechanisms; Alzheimer's Disease Mechanisms and Therapy; Vaccine Development; Osteoarthritis Prevention and Treatment; Prostate Cancer Mechanisms; Reducing Premature Death and Disability from Heart Attacks and Stroke; Restrictive Cardiomyopathy Mechanisms; Childhood Malaria Mechanisms and Therapy Development in Children and others.~~ [provide students with research opportunities in a wide variety of emerging biomedical science areas including: Human Genetics and Genomics; Precision Medicine; Cancer Biology and Prevention; Microbiology, Immunology and Infectious Disease; HIV/AIDS Mechanisms and Treatments; Respiratory Physiology and Biophysics; Visual Biology and Diseases; Breast Cancer Mechanisms and Therapy; Huntington's Disease Mechanisms; Alzheimer's Disease Mechanisms and Therapy; Vaccine Development; Osteoarthritis Prevention and Treatment; Prostate Cancer Mechanisms; Cardiac Physiology and Disease; Childhood Malaria Mechanisms and more.](#)

Marine Science and Oceanography Concentration (IBMO)

~~The IBMO~~ [Completion of the Marine Science and Oceanography](#) concentration provides students with a board understanding of oceanographic science along with the ~~research and~~ inquiry skills necessary to conduct research independently within their area of specialization. The IBMO curriculum ~~provides~~ [focuses on](#) both knowledge-based and laboratory- and field-based courses that promote the cross-disciplinary training students need to face the complex challenges of 21st century science. IBMO faculty have expertise in diverse ocean ecosystems, including developed and undeveloped coastlines, large estuaries and both deep sea and coastal

waters, and ~~support development of the students' research~~ provide students with research opportunities in areas of water quality, hydrology, coastal ecology, biogeochemical cycling, endangered and invasive species, ocean megafauna fisheries and aquaculture, harmful algal blooms, urbanization and underwater optical imaging and ocean monitoring systems.

Admission Requirements

The decision to consider ~~a student~~ an applicant acceptable for admission to the Integrative Biology program includes the following criteria:

1. Applicants must have a baccalaureate degree in biological science or a related field.
2. Applicants who meet the minimum University standard for grade point average of 3.0 (on a 4.0 scale). ~~and have scores of 150 each on the verbal and quantitative sections of the Graduate Record Examination are eligible to be considered for admission to the program. Successful applicants will normally show strong performance in their undergraduate coursework and on the verbal and quantitative sections of the Graduate Record Examination, which exceeds these scores.~~ Submission of scores on the verbal and quantitative sections of the Graduate Record Examination (GRE) is optional.
3. ~~Strength of letters of recommendation and personal statements from the applicants.~~ A minimum of three letters of recommendation and a personal statement. Successful applicants will have strong personal statements and recommendation letters from advisors who are familiar with their recent academic and research experiences.
4. International ~~students~~ applicants whose native language is not English must score at least 550 (paper-based test), 213 (computer-based test) or 79-80 (Internet-based test) on the Test of English as a Foreign Language (TOEFL). ~~Satisfactory TOEFL scores can offset verbal GRE scores at the discretion of the program's admission committee.~~ Additionally, international ~~students~~ applicants whose transcripts are from non-U.S. institutions must have their credentials evaluated course-by-course with a grade point average (GPA) calculation on a 4.0 scale. International ~~students~~ applicants must also demonstrate competency in spoken English.
5. ~~Each student's Ph.D. supervisor will be a member of the program's graduate faculty and will chair the supervisory and dissertation research committees. Student's pursuing an Integrative Biology concentration must match with a Ph.D. supervisor on the concentration's graduate faculty list (see concentration faculty lists on their respective concentration webpages). Integrative Biology core and IBNS concentration applicants may enter the program prior to identifying a Ph.D. supervisor and participate in laboratory rotations within their first year in the Ph.D. program. IBES applicants must have a Ph.D. supervisor from within FAU prior to applying. For IBES Ph.D. supervisor selection suggestions, students should refer to the Biology Department website to examine the fields and interests of individual faculty.~~ Applicants applying to the IBES or IBMO concentration must have a confirmed Ph.D. supervisor from within FAU prior to applying and submit the supervisor verification form with their application. The Ph.D. supervisor must be a member of the program's graduate faculty and will chair the supervisory and dissertation research committees (see program faculty lists on respective program webpages). Applicants applying to the IBIO core program or IBNS or IBBS concentration may enter the program with a confirmed Ph.D. supervisor from within FAU or participate in laboratory rotations within the first two semesters in the program. Applicants applying to the IBIO, IBNS or IBBS concentration that would like to

participate in laboratory rotations are strongly encouraged to directly contact potential PhD supervisor(s) from within FAU and secure their sponsorship or mentoring interest prior to applying. Applicants eligible to participate in laboratory rotations must identify which program faculty they have contacted on their application (see program faculty lists on respective program webpages).

Integrative Biology Degree Requirements

Doctoral degrees at FAU require at least 80 credits beyond the baccalaureate degree. The following are specific requirements of the program in Integrative Biology.

1. ~~The Integrative Biology Ph.D. program is research intensive. The 80 minimum post-baccalaureate credits required to complete the program will include a minimum of 18 credits of coursework with a cumulative grade point average of 3.0 or higher with the following requirements:~~
 - a. ~~Of the 18 required coursework credits, 9 to 10 credits (three courses) will be in courses designated as core courses; the core requirements include:~~

~~Integrative Biology 1, BSC 6390, 3 credits~~
~~Scientific Communication, BSC 6846, 3 credits~~

~~One course in statistics (students may fulfill the statistics core requirements by completing:~~

~~Experimental Design and Biometry (PCB 6456), 3 credits~~
~~Experimental Design 1, PSY 6206, 3 credits~~
 - b. ~~The remainder of the 18 credits will include elective courses that support the student's research plan. The student's Ph.D. supervisor and the supervisory committee must approve all elective courses;~~
 - c. ~~The elective courses must be 5000-, 6000- or 7000-level courses in biology, biomedical science, psychology, complex systems and brain sciences, geoscience, urban and regional planning, chemistry or approved cognates. Students participating in an Integrative Biology concentration must select from graduate-level elective courses related to the specific concentration (see the elective lists below for the IBNS and IBES). The lists of track-specific elective courses below are not exclusive and the selection of elective courses to meet degree requirements will be determined by consultation between the student and the Ph.D. supervisor and/or the student's advisory committee.~~
 - d. ~~Courses designated as proficiency or remedial (4000-level and below) may not be used to satisfy the course requirement.~~
2. ~~Students must enroll in three seminar/journal club courses offered by the program prior to graduation. A seminar course is considered to be one based on student participation in activities, such as student presentations or student/faculty-led discussions of relevant topics.~~
3. ~~Dissertation research under the direction of the student's dissertation research committee.~~
4. ~~A minimum of 25 credits of doctoral dissertation.~~
5. ~~Admission to candidacy follows successful defense of a dissertation research proposal. The defense of the dissertation will be held with the student's dissertation research committee.~~

~~6. Public presentation of the dissertation research.~~

~~The degree requirements listed above apply to all Integrative Biology program participants. Concentration-specific requirements are described below.~~

Degree Requirements

The Integrative Biology program is research-intensive and requires at least 72 credits beyond the baccalaureate degree. The following are specific requirements for this degree:

1. Students must earn a grade of “B” or higher in all graduate coursework and maintain a cumulative grade point average of 3.0 or higher.
2. Students must have a confirmed PhD supervisor by the end of their second semester in the program (Year 1, Semester 2).
3. Completion of 9 core credits listed in Integrative Biology Core Courses
4. Completion of at least 9 elective credits (three courses) up to 21 elective credits (seven courses) of graded coursework that support the student’s research plan:
 - a. The student's Ph.D. supervisor and/or supervisory committee must approve all elective courses.
 - b. Elective courses must be 5000-, 6000- or 7000-level courses in biology, biomedical science, chemistry and biochemistry, complex systems and brain sciences, engineering and computer science, environmental science, ecology, exercise science and health promotion, geosciences, marine science and oceanography, mathematical sciences, neuroscience, physics, psychology, urban and regional planning, special topics or approved cognates.
 - c. Students may elect to complete up to 6 credits designated Special Topics with the approval of their Ph.D. supervisor and/or supervisory committee.
 - d. Courses designated as proficiency or remedial (4000-level and below) may not be used to satisfy the elective course requirement.
 - e. Students participating in an Integrative Biology concentration must select from graduate-level elective courses related to the specific concentration (see the elective lists below for IBNS, IBES, IBBS, and IBMO). The lists of track-specific elective courses below are not exclusive and the selection of elective courses to meet degree requirements will be determined by consultation between the student and the Ph.D. supervisor and/or supervisory committee.
5. Completion of at least 3 credits of seminar/journal club courses taken as individual credits in three separate semesters. A seminar/journal club course is based on student participation in activities, such as student presentations or student/faculty-led discussions of relevant topics.
6. Completion of at least 25 dissertation credits conducting dissertation research under the direction of the student's dissertation research committee.
7. Remaining credits may include elective coursework, seminar/journal club courses, Integrative Biology lab rotation (BSC 6913), advanced research (BSC 7978) or dissertation (BSC 7980) credits that support the student's research plan with approval from the student's Ph.D. supervisor and/or supervisory committee.
8. Admission to candidacy requires both the successful writing and public presentation of an original dissertation research proposal. The defense of the dissertation proposal will be

held with the student's dissertation research committee following the public dissemination.

9. Degree completion requires both the successful writing and public presentation of original dissertation research. The defense of the dissertation research will be held with the student's dissertation research committee following the public dissemination.

Integrative Biology Core Courses – 9 credits

Integrative Biology 1	BSC 6390	3
Scientific Communication	BSC 6846	3

Choose one of the following courses

Experimental Design 1	PSY 6206	3
Experimental Design and Biometry	PCB 6456	3
Biostatistics	STA 5195	3

Electives – 9 to 21 credits – *Select at least three courses up to a maximum of seven courses at the 5000, 6000, or 7000 level.*

Other Requirements – 3 credits – *Select at least three 1-credit seminar or journal club courses taken in three separate semesters.*

Research – up to 26 credits – *Advanced Research in Integrative Biology is taken every semester while advancing toward candidacy.*

Advanced Research in Integrative Biology	BSC 7978	1-9
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Dissertation – 25 credits (minimum)

Dissertation	BSC 7980	1-9
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Minimum Degree Total **72**

The degree requirements listed above apply to all Integrative Biology program participants including students accepted to all concentrations. Additional concentration-specific requirements and approved elective lists are described below.

Neuroscience Concentration (IBNS) ~~Prerequisites~~ Core Courses and Electives

IBNS ~~Prerequisites~~ Core Courses

Students who enter the IBNS concentration with no prior neuroscience coursework must take two of the following five courses. Completion of these courses may be used toward fulfillment of the ~~9-credit~~ Integrative Biology elective requirement.

Cellular and Molecular Neuroscience	PSB 6345	3
Systems and Integrative Neuroscience	PSB 6346	3
Practical Cell Neuroscience	BSC 6417C	3
Neurophysiology	PCB 6835C	3
Advanced Neurophysiology Lab	PCB 6837L	3

IBNS Electives

Students enrolled in the IBNS concentration must select graduate-level elective courses ~~that are~~

relevant to the field of neuroscience. ~~When these courses are completed, they may be used toward fulfillment of the 9-credit Integrative Biology elective requirement. See the electives table below.~~ Students may choose from the following approved IBNS electives toward fulfillment of the Integrative Biology elective requirement. Students may elect to complete up to 6 credits designated Special Topics with the approval of their Ph.D. supervisor and/or supervisory committee.

General Neuroscience

Cellular and Molecular Neuroscience	PSB 6345	3
Systems and Integrative Neuroscience	PSB 6346	3
Special Topics	BSC 6936	3

Molecular and Cellular Neuroscience

Neurobiology of Addiction	PCB 5844	3
Neural Plasticity	GMS 6021	3
Advanced Cell Physiology	PCB 6207	3
Developmental Neurobiology	PSB 6515	3
Principles of Neuroimmunology	GMS 6708	3
Brain Diseases: Mechanisms and Therapy	BMS 6736	3
Cellular Neuroscience and Disease	PCB 6849	3
Practical Cell Neuroscience	BSC 6417C	3
Autonomic Function and Diseases	BMS 6523	3
Neurophysiology	PCB 6835C	3
Advanced Neurophysiology Lab	PCB 6837L	3
Human Neuroanatomy	ZOO 6748	3

Behavioral Neuroscience

Seminar in Behavioral Neuroscience	PSB 6058	3
Developmental Neuropsychology	PSB 6516	4
Principles of Neuroscience	PSB 6037	3

Cognitive Neuroscience

Cognitive Neuroscience	ISC 5465	3
Seminar in Cognitive Development	DEP 6067	3
Seminar in Cognition	EXP 6609	3
Seminar in Human Perception	EXP 6208	3

Theoretical and Dynamical Neuroscience

Introduction to Neural Networks	CAP 5615	3
Introduction to Data Science	CAP 5768	3
Computational Neuroscience 1	ISC 6460	3
Bioinformatics	BSC 6458C	4
Bioinformatics: Engineering Perspectives	BME 6762	3

Environmental Science Concentration (IBES) Electives

IBES Electives

Students enrolled in the IBES concentration must complete at least one course from each of the two focal areas below [toward fulfillment of the Integrative Biology elective requirement](#).

~~Completion of these courses may be used toward fulfillment of the 9-credit Integrative Biology elective requirement.~~ Students may elect to complete up to 6 credits designated Special Topics with the approval of their Ph.D. supervisor and/or supervisory committee.

Statistics and Modeling

Experimental Design and Biometry	PCB 6456	3
Modeling Groundwater Movement	GLY 6836	3
Ecological Theory	PCB 6406	3

Ecology and Earth Sciences

Special Topics	BSC 6936	3
Biogeography	GEO 5305	3
Plants and People	GEO 6317	3
Environmental Restoration	EVR 6334	3
Flora of South Florida	BOT 5155	2
Flora of South Florida Lab	BOT 5155L	2
Advanced Plant Physiology	BOT 6506	2
Advanced Plant Physiology Lab	BOT 6506L	2
Coastal Plant Ecology	BOT 6606	2
Coastal Plant Ecology Lab	BOT 6606L	2
Conservation Biology	PCB 6045	3
Marine Ecology	PCB 6317	3
Advanced Ecology	PCB 6046	3
Marine Ecology Lab and Field Studies	PSB 6317L	2
Freshwater Ecology	PCB 6307	3
Freshwater Ecology Lab	PCB 6307L	2
Symbiosis	BSC 6365	3
Environmental Physiology	PCB 6749	3
Marine Geology	GLY 5736C	3
Advanced Topics in Applied, Coastal, and Hydrogeology	GLY 5934	3
Coastal Environments	GLY 6737	3
Shore Erosion and Protection	GLY 5575C	3
Global Environmental Change	GLY 6746	3
Environmental Geophysics	GLY 6457	3
Methods in Hydrogeology	GLY 6838	3
Natural History of Indian River Lagoon	OCB 6810	3

Marine Global Change	OCE 6019	3
Seminar in Ichthyology Ichthyology	ZOO 6459	1-2
Marine Invertebrate Zoology	ZOO 6256	3
Marine Invertebrate Zoology Lab	ZOO 6256L	2
Natural History of Fishes	ZOO 6456	3
Natural History of Fishes Lab	ZOO 6456L	2
Seminar on Emerging Topics in Avian Ecology	ZOO 6544C	1
Chemistry for Environmental Scientists	CHS 6611	3
Environmental Geochemistry	GLY 5243	3
Physiology of Marine Animals	PCB 6775	3
Introduction to GIS in Planning	URP 6270	3
Principles of Geographic Information Systems	GIS 5051C	3
Applications in Geographic Information Systems	GIS 5100C	3
Programming in Geographic Information Systems	GIS 5103C	3
Remote Sensing of the Environment	GIS 5038C	3
Digital Image Analysis	GIS 5033C	3
Advanced Remote Sensing	GIS 6039	3
Hyperspectral Remote Sensing	GIS 6127	3
Topics in Geoinformation Science	GIS 6120	3

Biomedical Science Concentration (IBBS) Core Courses and Electives

IBBS Core Courses

Students who enter the IBBS concentration without a core course or equivalent must complete one of the core courses listed below. When this course is completed, it may be used toward fulfillment of the ~~9-credit~~ Integrative Biology elective requirement.

Biomedical Data and Informatics	BSC 6459	3
Scientific Writing	BSC 6846	3
Data Interpretation and Analysis in the Age of Precision Medicine	GMS 6860	3
Advanced Molecular and Cell Biology	PCB 5532	3
Human Genetics	PCB 6665	3

IBBS Electives IBBS Electives

Students may choose from the following approved IBBS electives toward fulfillment of the ~~9-credit~~ Integrative Biology elective requirement. Students may elect to complete up to 6 credits designated Special Topics with the approval of their Ph.D. supervisor and/or supervisory committee.

Integrated Morphology 1	BMS 6102C	4
Integrated Morphology 2	BMS 6104C	4

Autonomic Function and Disease	BMS 6523	3
Fundamentals of General Pathology	BMS 6601	3
Brain Diseases: Mechanism and Therapy	BMS 6736	3
Biomedical Data and Informatics	BSC 6459	3
Neural Plasticity	GMS 6021	3
Biomedical Science Core Technologies Laboratory	GMS 6091C	3
Macromolecules and Human Disease Macromolecular Therapy for Human Diseases	GMS 6301	3
Molecular Basis of Disease and Therapy	GMS 6302	3
Pharmacology	GMS 6513	3
Advanced Pharmacology	GMS 6551	3
Principles of Neuroimmunology	GMS 6708	3
Biomedical Concepts and Translational Applications	GMS 6841	3
Data Interpretation and Analysis in the Age of Precision Medicine	GMS 6860	3
Host Defense and Inflammation	MCB 6208	3
Advanced Molecular and Cell Biology	PCB 5532	3
Neurobiology of Addiction	PCB 5844	3
Advanced Cell Physiology	PCB 6207	3
Molecular Basis of Human Cancer	PCB 6235	3
Problem-Based Immunology	PCB 6238	3
Tumor Immunology	PCB 6239	3
Human Genetics	PCB 6665	3
Integrating Genomics into Predictive Health	PCB 6667	3
Emerging Applications in Oncology and Pharmacogenomics	PCB 6696	3
Biomedical Data and Informatics	PCB 6459	3
Molecular Biology of the Cardiovascular System and Cardiac Disease	PCB 6705	3
Molecular Mechanism of Aging and Age-Related Diseases	PCB 6817	3
Adult Neurogenesis	PCB 6848	3
Physiology of the Heart	PCB 6885	3
Special Topics	PCB 6933	3
Developmental Neurobiology	PSB 6515	3

Marine Science and Oceanography (IBMO) ~~Required~~ Core Courses and Elective Courses
IBMO Required Core Courses

Students who enter the IBMO concentration without ~~these~~ two courses or equivalent must complete ~~two~~ of the core courses listed below. Completion of these courses may be used toward fulfillment of the ~~9-credit~~ Integrative Biology elective requirement.

~~Biological and Chemical Oceanography~~ ~~OCE 6057~~ 3

~~Physical and Geological Oceanography~~ ~~OCE 6097 3~~

Biological Oceanography OCB 6066 3

Choose one of the following courses

Chemical Oceanography OCC 6050 3

Physical and Geological Oceanography OCE 6097 3

IBMO Electives

Students may choose from the following IBMO electives for fulfillment of the ~~9-credit~~ Integrative Biology elective requirement. Students may elect to complete up to 6 credits designated Special Topics with the approval of their Ph.D. supervisor [and/or supervisory committee](#).

Marine Biology

Advances in Finfish Aquaculture	BSC 6342	3
Special Topics	BSC 6936	3
Marine Molecular Biology	PCB 6465	3
Aquatic Animal Health	PCB 6772	3
Physiology of Marine Animals	PCB 6775	3
Sensory Biology and Behavior of Fishes	PCB 6871	3
Marine Invertebrate Zoology	ZOO 6256	3
Marine Invertebrate Zoology Lab	ZOO 6256L	2
The Biology of Sea Turtles	ZOO 6406	3
Biology of Sharks and Their Relatives	ZOO 6409	3
Natural History of Fishes	ZOO 6456	3
Natural History of Fishes Lab	ZOO 6456L	2

Conservation and Ecology

Coastal Plant Ecology	BOT 6606	2
Coastal Plant Ecology	BOT 6606L	2
Marine Conservation Biology	BSC 6316	3
Coral Reef Ecosystems	OCB 6266	3
Coral Reef Ecosystems Lab	OCB 6266L	1
Natural History of the Indian River Lagoon	OCB 6810	3
Conservation Biology	PCB 6045	3
Advanced Ecology	PCB 6046	3
Marine Ecology	PCB 6317	3
Marine Ecology Lab and Field Studies	PCB 6317L	2
Ecological Theory	PCB 6406	3

Remote Sensing and Geographic Information Systems

Digital Image Analysis	GIS 5033C	3
Remote Sensing of the Environment	GIS 5038C	3
Principles of Geographic Information Systems	GIS 5051C	3
Applications in Geographic Information Systems	GIS 5100C	3
Programming in Geographic Information Systems	GIS 5103C	3
Advanced Remote Sensing	GIS 6039	3
Topics in Geoinformation Science	GIS 6120	3
Hyperspectral Remote Sensing	GIS 6127	3
<i>Chemistry</i>		
Chemistry for Environmental Scientists	CHS 6611	3
Environmental Geochemistry	GLY 5243	3
<i>Marine Optics</i>		
Underwater Optical Imaging for Marine Scientists	OCE 6267	3
Ocean Monitoring Systems and Implementation Strategies	OCE 6268	3
Marine Optics	OCE 6269	3
Data Processing for Studies and Modeling of Marine Systems	OCE 6673	3

Re: Integrative Biology PhD Program Catalog Changes

Marc Kantorow <MKANTORO@health.fau.edu>

Tue 8/1/2023 1:46 PM

To: Stacey Caplan <SCAPLAN4@fau.edu>; Sarah Milton <smilton@fau.edu>; Xing-Hai Zhang <xhzhang@fau.edu>

Cc: Bridget Smith <BSTATLER@health.fau.edu>

Hi Stacey,

Looks great for Biomedical Science!—We support this.

Thanks to you and Bridget for the hard work!

All the best,

Marc

Marc Kantorow, Ph.D, FARVO
Professor of Biomedical Science
Associate Dean for Graduate Programs
Director Postbaccalaureate Programs
Charles E. Schmidt College of Medicine
Florida Atlantic University
Boca Raton, FL 33467
561-297-2910

From: Stacey Caplan <SCAPLAN4@fau.edu>

Date: Tuesday, August 1, 2023 at 10:45 AM

To: Marc Kantorow <MKANTORO@health.fau.edu>, Sarah Milton <smilton@fau.edu>, Xing-Hai Zhang <xhzhang@fau.edu>

Cc: Bridget Smith <BSTATLER@health.fau.edu>

Subject: Integrative Biology PhD Program Catalog Changes

Good Morning,

The Biology Department's Integrative Biology (IB) PhD program is currently making catalog changes. The IB PhD program directors are requesting the support of the College of Medicine to add the following courses below as elective options for the Neuroscience and Biomedical Science concentrations. The program directors feel that adding these courses to the approved elective lists will be beneficial for students in those concentrations. Please let us know if you will support this catalog change for the IB PhD program. Thanks so much for your time and consideration of our request.

- **IB-Neuroscience (IBNS) Electives**

- PCB 5844 Neurobiology of Addiction
- GMS 6021 Neural Plasticity
- GMS 6708 Principles of Neuroimmunology

• **IB-Biomedical Science (IBBS) Electives**

- GMS 6860 Data Interpretation & Analysis in the Age of Precision Medicine
- GMS 6021 Neural Plasticity
- GMS 6091C Biomedical Science Core Technologies Laboratory
- GMS 6513 Pharmacology
- GMS 6551 Advanced Pharmacology
- GMS 6708 Principles of Neuroimmunology
- GMS 6841 Biomedical Concepts and Translational Applications
- PCB 5532 Advanced Molecular and Cell Biology
- PCB 6696 Emerging Applications in Oncology and Pharmacogenomics
- PCB 6667 Integrating Genomics into Predictive Health
- PCB 6817 Molecular Mechanism of Aging and Age-Related Diseases
- PCB 6933 Special Topics

Best Regards,
Stacee



Stacee Lee Caplan, Ph.D.
Graduate Program Coordinator
Department of Biological Sciences
777 Glades Road, Sanson Science SC-1, Boca Raton, FL 33431
Phone: 561-297-4750 | Fax: 561-297-2749
E-mail: scaplan4@fau.edu | Web site: biology.fau.edu

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Re: Integrative Biology PhD Program Catalog Changes

Hanqi Zhuang <zhuang@fau.edu>

Thu 7/27/2023 9:07 AM

To: Stacey Caplan <SCAPLAN4@fau.edu>; Sarah Milton <smilton@fau.edu>; Xing-Hai Zhang <xhzhzhang@fau.edu>

Yes, the EECS department supports this request.

Best,
Hanqi

Hanqi (Hanchi) Zhuang, Ph.D.
Chair and Professor
Department of Electrical Engineering and Computer Science
Florida Atlantic University
777 Glades Rd, EE403A
Boca Raton, FL 33431
561-297-3413
<http://www.ceecs.fau.edu/>

From: Stacey Caplan <SCAPLAN4@fau.edu>

Sent: Thursday, July 27, 2023 9:06 AM

To: Hanqi Zhuang <zhuang@fau.edu>; Sarah Milton <smilton@fau.edu>; Xing-Hai Zhang <xhzhzhang@fau.edu>

Subject: Integrative Biology PhD Program Catalog Changes

Good Morning,

The Biology Department's Integrative Biology (IB) PhD program is currently making catalog changes. The IB PhD program directors are requesting the support of the Department of Electrical Engineering and Computer Science to include CAP 5615 Introduction to Neural Networks and CAP 5768 Introduction to Data Science as elective course options in the IB-Neuroscience elective list (see below, course addition highlighted). The program directors feel that adding these elective course options will be beneficial for IB students. Please let us know if you will support this catalog change for the IB PhD program. Thanks so much for your time and consideration of our request.

Theoretical and Dynamical Neuroscience

Introduction to Neural Networks	CAP 5615	3
Introduction to Data Science	CAP 5768	3
Computational Neuroscience 1	ISC 6460	3
Bioinformatics	BSC 6458C	4
Bioinformatics: Engineering Perspectives	BME 6762	3

Best Regards,
Stacey

RE: Integrative Biology PhD Program Catalog Changes

Tiffany Roberts Briggs <briggst@fau.edu>

Mon 7/31/2023 10:22 AM

To: Stacey Caplan <SCAPLAN4@fau.edu>; Sarah Milton <smilton@fau.edu>; Xing-Hai Zhang <xhzhang@fau.edu>

Hi Stacey,

This course is taught by HBOI faculty. But Geosciences is in support of this change.

Thanks,

Tiffany

Tiffany Roberts Briggs, Ph.D.

Chair & Associate Professor

Department of Geosciences

Florida Atlantic University

Boca Raton, FL 33431

561-297-4669

[Coastal Studies Lab](#)

From: Stacey Caplan <SCAPLAN4@fau.edu>

Sent: Thursday, July 27, 2023 9:12 AM

To: Tiffany Roberts Briggs <briggst@fau.edu>; Sarah Milton <smilton@fau.edu>; Xing-Hai Zhang <xhzhang@fau.edu>

Subject: Integrative Biology PhD Program Catalog Changes

Good Morning,

The Biology Department's Integrative Biology (IB) PhD program is currently making catalog changes. The IB PhD program directors are requesting the support of the Geosciences Department to include OCE 6097 Physical and Geological Oceanography as part of the core courses elective course options in the IB-Marine Science & Oceanography core course list (see below, course addition highlighted). The program directors feel that adding this course will be beneficial for IB students. Please let us know if you will support this catalog change for the IB PhD program. Thanks so much for your time and consideration of our request.

Biological Oceanography	OCB 6066 3
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Choose one of the following courses

Chemical Oceanography	OCC 6050 3
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Physical and Geological Oceanography	OCE 6097 3
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Best Regards,
Stacey

Re: Integrative Biology PhD Program Catalog Changes

Yuan Wang <YWANG@fau.edu>

Wed 7/26/2023 6:04 PM

To: Stacey Caplan <SCAPLAN4@fau.edu>; Sarah Milton <smilton@fau.edu>; Xing-Hai Zhang <xhzhang@fau.edu>

Cc: Hongwei Long <hlong@fau.edu>; Stephen Locke <lockes@fau.edu>

Dear Stacey,

The Department of Mathematical Sciences will support the catalog change for the IB PhD program by offering STA 5195 in the spring semesters.

It would be great if you could advise and encourage your students to take this course. Hopefully, by a combination of the IB students and students from math and some other programs, the course enrollment will go beyond the minimum threshold to be offered.

Please let me know if more statements or more information are needed from us.

Kind regards,

Yuan

^^

Yuan Wang

Professor and Department Chair

Department of Mathematical Sciences

Florida Atlantic University

Tel: 7-2672

^^

On 7/26/2023 3:43 PM, Stacey Caplan wrote:

Good Afternoon,

The Biology Department's Integrative Biology (IB) PhD program is currently making catalog changes. The IB PhD program directors are requesting the support of the Mathematical Sciences Department to include STA 5195 Biostatistics as a statistics course option in the IB core curriculum (see below, course addition highlighted). Currently, the IB program only offers two statistics course options (PCB 6456 and PSY 6206); however, both of these courses are only offered during fall semesters. The program directors feel that a statistics course option offered during spring semesters will be beneficial for some students that may need to take additional courses during spring semesters. Please let us know if you will support this catalog change for the IB PhD program. Thanks so much for your time and consideration of our request.

Integrative Biology Core Courses – 9 credits

Integrative Biology 1	BSC 6390	3
Scientific Communication	BSC 6846	3

Choose one of the following courses

Experimental Design 1	PSY 6206	3
Experimental Design and Biometry	PCB 6456	3
Biostatistics	STA 5195	3

Electives – 9 to 21 credits – *Select at least three courses up to a maximum of seven courses at the 5000, 6000, or 7000 level.*

Other Requirements – 3 credits – *Select at least three 1-credit seminar or journal club courses taken in three separate semesters.*

Research – up to 26 credits – *Advanced Research in Integrative Biology is taken every semester while advancing toward candidacy.*

Advanced Research in Integrative Biology	BSC 7978	1-9
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Dissertation – 25 credits (minimum)

Dissertation	BSC 7980	1-9
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Minimum Degree Total **72**

Best Regards,
Stacee



Stacee Lee Caplan, Ph.D.
Graduate Program Coordinator
Department of Biological Sciences
777 Glades Road, Sanson Science SC-1, Boca Raton, FL 33431
Phone: 561-297-4750 | Fax: 561-297-2749
E-mail: scaplan4@fau.edu | Web site: biology.fau.edu

Re: Integrative Biology PhD Program Catalog Changes

Alan Kersten <akersten@fau.edu>

Fri 7/28/2023 11:06 AM

To: Stacey Caplan <SCAPLAN4@fau.edu>; Sarah Milton <smilton@fau.edu>; Xing-Hai Zhang <xhzhzhang@fau.edu>

Hi Stacey,

I've discussed this with Gizelle Anzures, who teaches the Seminar in Cognitive Development, and she has no problem with including this class on the list of electives for the Integrative Biology Ph.D. as long as there remains sufficient space in the course to also accommodate our Psychology graduate students. We will want to monitor this as we go forward, but I'm happy to support this change.

Thanks,

Alan

Alan Kersten
Professor and Chair
Department of Psychology
Florida Atlantic University
Boca Raton, FL 33431

From: Stacey Caplan <SCAPLAN4@fau.edu>

Sent: Thursday, July 27, 2023 9:01 AM

To: Alan Kersten <akersten@fau.edu>; Sarah Milton <smilton@fau.edu>; Xing-Hai Zhang <xhzhzhang@fau.edu>

Subject: Integrative Biology PhD Program Catalog Changes

Good Morning,

The Biology Department's Integrative Biology (IB) PhD program is currently making catalog changes. The IB PhD program directors are requesting the support of the Psychology Department to include DEP 6067 Seminar in Cognitive Development as an elective course option in the IB-Neuroscience elective list (see below, course addition highlighted). The program directors feel that adding this elective course option will be beneficial for IB students. Please let us know if you will support this catalog change for the IB PhD program. Thanks so much for your time and consideration of our request.

Cognitive Neuroscience

Cognitive Neuroscience	ISC 5465	3
Seminar in Cognitive Development	DEP 6067	3
Seminar in Cognition	EXP 6609	3
Seminar in Human Perception	EXP 6208	3

Best Regards,
Stacey